CONSUMER PROTECTION ASSOCIATION
HIMMATNAGAR
DIST. : SABARKANTHA
GUJARAT

Consultation Paper

on

Making ICT Accessible for Persons with Disabilities

Introduction :

In India, about 60 million people are disabled and 42.5% of them are women while 75% of people with disabilities come from rural areas. In India, there is a confluence of barriers to accessibility with inaccessible and unaffordable technologies, inaccessible websites and unsupportive laws.

A survey on the impact of disabilities on computer technology conducted by Forrester Research found that: approximately one in four (25%) computer users have a visual difficulty or impairment; nearly one in four (24%) computer users have a dexterity difficulty or impairment; one in five (20%) computer users have a hearing difficulty or impairment; and about 16% of computer users have a cognitive difficulty or impairment. It becomes imperative for organizations

offering their businesses online to make their facilities accessible to persons with disabilities to be able to tap into a large base of potential consumers.

There are many reasons why people may be experiencing varying degrees of auditory, cognitive, physical, speech, and visual disabilities. For instance, some may have disabilities from birth, an illness, disease, or accident, or they may develop impairments with age. Some may not consider themselves to have disabilities even if they do experience such functional limitations.

The need for accessibility – both in the physical environment and in the use of information technology – is accentuated by the increase in consumption among the general public. As more and more persons with disabilities start utilizing public marketplaces, products and services, a demand is generated to make these accessible to be able to reach out to a group of untapped consumers.

Some facts :

- Worldwide, some 1 billion persons with a disability (=15%)

- 80% of persons with disabilities live in low income countries

- Amongst people below the poverty level, 1 out of 5 is a PwD

- UN Convention on the Rights of Persons with Disabilities (UNCRPD) mandates signatories to provide public information in formats appropriate to different kinds of disabilities.

Q1. **Which are the disabilities, with specific accessibility requirement, other than those mentioned in para 2.3 that require consideration for preparing a framework?**

Comments :

Definition :

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.

Age-related impairments:

Many people develop age-related impairments. While they share the same functional requirements as others with disabilities, sometimes there are significant differences in the use of assistive technologies, the level of computer skills, or in the use of the Web in general.

Common age-related impairments are Reduced Vision, Hand tremor and mild memory loss.

Like many older individuals there will be difficulty in reading small text and clicking on small links and form elements. They encounters problems when text does not reflow when it is enlarged and they have to forced to scroll back and forth to read the enlarged content, which means he easily loses track of his place. They have also problems with CAPTCHA images found on many social media sites. The text is so distorted, even when they enlarges it, that they often cannot

accurately enter the text. They have a better experience on sites that use alternative CAPTCHA options, unfortunately only a small number currently do.

A special mouse that is easier to control the hand tremors. A web browser which saves thumbnail images of frequently visited sites, which makes it easier for them to keep track of the sites they goes to most often.

Multiple disabilities:

Some people have combinations of different kinds of disabilities, which may limit their approaches for interacting. For instance, someone who is deaf and has low vision might benefit from captions for audio, but only if these captions have adjustable size and color.

Health conditions:

Some people have health conditions that may affect their stamina, dexterity, or concentration. For instance, some may experience fatigue, pain, or other symptoms that could have an impact on their physical use of the computer or limit the duration or extent of their use of the Web.

Changing abilities:

Some people may be experiencing progressive or recurring functional limitations that impact their uses differently at different times. For instance, some may need particular accessibility features on one day, and others or none on another day, depending on their condition.

Temporary impairments:

Some people may be experiencing temporary impairments such as those that may occur due to an accident, surgery, or medication. They may not know about accessibility solutions, may not know how to use accessibility features, and may be unaware of their needs.

Situational limitations:

Some people may be experiencing constraints due to their surrounding or due to other situational aspects. For instance, they may be in a loud environment and unable to hear audio, in bright sunlight and unable to see a screen, or they may not be able to afford some technologies.

Websites and web tools designed for people with a broad range of abilities benefit everyone, including people without disabilities. It is, therefore, important to consider the broad diversity of functional needs rather than to categorize people according to medical classifications.

As per the " The Rights of persons with disabilities Bill – 2016 " the types of disabilities have been increased from existing 7 to 21, which are as follow :

1. **Blindness**
2. **Low-vision**
3. **Leprosy Cured persons**
4. **Hearing Impairment (deaf and hard of hearing)**
5. **Loco motor Disability**
6. **Dwarfism**
7. **Intellectual Disability**

8.   **Mental Illness**

9.   **Autism Spectrum Disorder**

10.   **Cerebral Palsy**

11.   **Muscular Dystrophy**

12.   **Chronic Neurological conditions**

13.   **Specific Learning Disabilities**

14.   **Multiple Sclerosis**

15.   **Speech and Language disability**

16.   **Thalassemia**

17.   **Hemophilia**

18.   **Sickle Cell disease**

19.   **Multiple Disabilities including deaf blindness**

20.   **Acid Attack victim**

21.   **Parkinson's disease**

Q2.   Apart from the challenges enumerated in para 2.3 of the Consultation Paper, what other challenges do PwDs face while accessing telecommunication and broadcasting services?

Comments :

Auditory disability :

Auditory disabilities can be defined in :

1. Hard of hearing - mild or moderate hearing impairments in one or both ears.

2. Deafness - substantial, uncorrectable impairment of hearing in both ears.

3. Deaf-blindness - substantial, uncorrectable hearing and visual impairments.

4. Some people with auditory disabilities can hear sounds but sometimes not sufficiently to understand all speech, especially when there is background noise. This can include people using hearing aids.

Examples of barriers for people with auditory disabilities :

1. Audio content, such as videos with voices and sounds, without captions or transcripts.

2. Media players that do not display captions and that do not provide volume controls.

3. Media players that do not provide options to adjust the text size and colors for captions.

4. Web-based services, including web applications, that rely on interaction using voice only.

5. Lack of sign language to supplement important information and text that is difficult to read.

Solution :

To use the Web effectively, people with auditory disabilities often rely on:

1. Transcripts and captions of audio content, including audio-only content and audio tracks in multimedia;

2. Media players that display captions and provide options to adjust the text size and colors of captions;

3. Options to stop, pause, and adjust the volume of audio content (independently of the system volume);

4. High-quality foreground audio that is clearly distinguishable from any background noise.

For some people with auditory disabilities, sign language is the primary language, and they may not read the written language as fluently. Providing important information in sign language and using simpler text that is supplemented by images, graphs, and other illustrations help make web content more understandable to many people. However, it is important to remember that not all people with auditory disabilities know sign language.

Visual Disabilities :

Visual disabilities range from mild or moderate vision loss in one or both eyes ("low vision") to substantial and uncorrectable vision loss in both eyes ("blindness"). Some people have reduced or lack of sensitivity to certain colors ("color blindness"), or increased sensitivity to bright colors. These variations in perception of colors and brightness can be independent of the visual acuity.

Color blindness - includes difficulty distinguishing between colors such as between red and green, or between yellow and blue, and sometimes inability to perceive any color.

Low vision - Includes poor acuity (vision that is not sharp), tunnel vision (seeing only the middle of the visual field), central field loss (seeing only the edges of the visual field), and clouded vision.

Blindness - substantial, uncorrectable loss of vision in both eyes.

Deaf-blindness - substantial, uncorrectable visual and hearing impairments.

Browsing :

People with visual disabilities typically rely on changing the presentation of content into forms that are more usable for their particular needs. For example by:

1. Enlarging or reducing text size and images;

2. Customizing settings for fonts, colors, and spacing;

3. Listening to text-to-speech synthesis of the content;

4. Listening to audio descriptions of video in multimedia;

5. Reading text using refreshable Braille.

Some people are only seeing small portions of the content at a time or are perceiving the colors and design differently. Some people are using customized fonts, colors, and spacing to make the content more readable, or they are

navigating through the content using keyboard only because they cannot see the mouse pointer.

Examples of barriers for people with visual disabilities

1.   Images, controls, and other structural elements that do not have equivalent text alternatives.

2.   Text, images, and page layouts that cannot be resized, or that lose information when resized.

3.   Missing visual and non-visual orientation cues, page structure, and other navigational aids.

4.   Video content that does not have text or audio alternatives, or an audio-description track.

5.   Inconsistent, unpredictable, and overly complicated navigation mechanisms and page functions.

6.   Text and images with insufficient contrast between foreground and background color combinations.

7.   Websites, web browsers, and authoring tools that do not support the use of custom color combinations.

8.   Websites, web browsers, and authoring tools that do not provide full keyboard support.

Solution :

In Visual Impairment Color blindness should included.

1. There should be better experience with online content and apps that use adequate contrast and allow them to adjust contrast settings in the browser.

2. They can be better able to recognize when information is required when asterisks are used.

3. They can more easily identify the products like to purchase, especially clothing, when the color label names are included in the selection options rather than color swatches alone.

Q3: In your opinion, what are the reasons for the desired   benefits   of   ICT (telecom and broadcasting) not reaching the PwDs despite several policy measures and scheme being implemented?

Comments :

On analyzing the existing Laws, Schemes and Concessions at the Central as well as State Government level, the following observations we found :

1. **Schemes not in consonance with National Laws :**

As per the Supreme Court judgment, as India has ratified the UNCRPD, all its provisions become applicable to the country as well. Thus all the Acts, Notifications and office orders need to be revised to render our

Laws, Rules and Regulations and provisions in consonance with the provision of UNCRPD. Once we have National Laws which are applicable to all the citizens of our country with the same force, it is mandatory to introduce all the schemes, concessions and entitlement online with provision of these Acts.

2. A detailed Analysis of the policies introduced by different state Governments establishes wide variation. As we have National laws, it is imperative that all such should be uniform.

3. A lot more needs to be done in creating awareness and ensuring implementation and simplifying the procedure.

4. The National policy recognizes the NGO sector as a very important institutional mechanism. The existing policies however do not mention clearly the extent of involvement of NGOs. Interaction with NGOs will enhance on various issues regarding Planning, Policy formulation and Implementation.

5. Yet legislation is only the beginning, albeit an important one, in the long journey to translating ideals and objectives into reality.

6. Raising awareness on the rights, entitlements and duties embodied in the law is the other critical task to ensure accountability among public authorities and bring about real and lasting transformation in the lives of the disabled.

7. Experience of the past decade in India, evolving case law in particular, shows that a lack of awareness, in combination with traditional stereotypes, continue to pose major hurdles on the path of effective enforcement of key provisions of the law.

8. Dissemination of information would contribute also to greater and more efficient utilization of budgetary allocations on disability.

9. It is estimated that close to 10 per cent of India's overall population is afflicted with one or another disability. To the extent that disability is both a cause and consequence of poverty, bringing disabled people into the mainstream is critical to the governments' efforts.

10. The Acts that are already in place are still not being implemented to the full effect.

11. The participation of industries is lacking.

Q4: What additional or corrective measures can be taken by the Government to enable better access to telecommunication and broadcasting services and devices to PwDs? Please give a rationale for your response.

Comments :

1. Raising the rates of literacy is the other target. In this regard, enrollment of the vast majority of disabled children in educational institutions is itself contingent upon the availability of suitably trained teachers and the provision of physical access to school premises.

2. There should be guide lines for Accessibilities of Telecommunication equipment for Physical disabilities and elderly persons.

3. There should be a Universal Design Approach by establishing an environment for physically Disability and elderly persons to use Telecommunication and Broad Casting.

4. Establishment of an environment that removes the ICT & Broad Casting barriers that impedes disabilities by :

    (i) Promotion of development of communication and broadcasting equipments and services to meet their needs.

    (ii) Subsidize for P & D to improve communication and Broadcasting services.

    (iii) Subsidies for promotion of projects for facilitation of use of telecommunication, the development and provision of communications and broadcast services for people with disability.

5. To promote the use of public websites, there should be practical schemes, procedures and manuals for maintaining and improving actual web accessibility.

6. To promote the accessibility of Telecommunications and broadcasting equipments and services, there should be principles of accessibility of Telecommunication and Broadcasting equipment for persons with disabilities.

7. There should be a high level committee for deliberating telecommunications and broad casting accessibility.

8. To promote social participation of persons with disabilities and older persons, it is important to understand that not only taking measures for persons with disabilities by the Government but also approaches of the entire Indian society are essential.

9. Creating awareness on universal electronics accessibility and universal design.

10. Capacity building and infrastructure development.

11. Setting up of model electronics and ICTs centers for providing training and demonstration to special educators and physically as well as mentally challenged persons.

12. Conducting research and development, use of innovation, ideas, technology etc. whether indigenous or outsourced from abroad.

13. Developing programme and schemes with greater emphasis for differently able women/children.

14. Developing procurement guidelines for electronics and ICTs for accessibility and assistive needs.

15. Focused efforts need to be made to develop assistive technologies in local Indian languages, compatible hardware on which these technologies can be used, i.e., mobiles and computers should be made available at affordable rates, training to use these technologies for both disabled users, as well as support staff in schools needs to be provided, Internet connectivity must be enabled at low cost, access to existing digital resources could be enabled through setting up of library networks and so on.

Q5: **Apart from the measures suggested by ITU, what additional measures can be taken by the TSPs and equipment vendors/suppliers and other stakeholders to address the challenges faced by PwDs while accessing telecom and broadcasting services?**

Comments :

- ➢ Information intended for the general public must be accessible to persons with disabilities through accessible formats and technologies in a "timely manner and without additional cost".
- ➢ Different Activities and programs should be conducted.
- ➢ Reasonable employments for qualified people with disabilities should be given.
- ➢ Awareness and educational programs should be conducted to use of Assistive listening system, Hearing aid compatible phones, Sign language interpreters, Amplifiers, Captioning, Television decoders, screen reader, material in brail etc. etc..
- ➢ Equipment distributers can offer cost free leases, low interest loan or voucher for equipment.

Q6.   What are the areas where collaboration between various stakeholders would be useful and how?

Comments :

Everyone who has an interest in disability or a responsibility for addressing issues of disability because of the nature of their work, including persons with or without disabilities in civil society, Consumer Advocacy Groups, civil and public service, national human rights institutions, parliaments, development agencies, universities and the private sector. Civil society, particularly Disabled Peoples Organizations (DPOs), the private sector, the media, academic institutions, and other stakeholders, who have come together to advance the rights and inclusion of persons with disabilities.

Multi-stakeholder partnerships should be voluntary and collaborative relationships between various parties, in which all participants agree to work together to achieve a common purpose or undertake a specific task and to share risks and responsibilities, resources and benefits.

Multi-stakeholder partnerships can work at regional, national or community level. Their scope and nature can vary widely, from short-term or one-off collaborative efforts to longer-term efforts. They can also focus on a single narrow goal or entail multi-issue collaboration. Multi-stakeholder partnerships are greater than the sum of their parts and are about creating lasting and meaningful impact at all levels of action. They should based on nurturing working

relationships based on trust, mutual respect, open communication and understanding between stakeholders regarding each other's strengths and weaknesses.

Those seeking to form a partnership should begin by clearly identifying their desired outcome or goal. While in the context of the CRPD all actors should be seeking to advance realization of the rights and inclusion of persons with disabilities in line with the Convention, specific goals may vary tremendously.

Once the desired outcome or goal has been identified, it is important to map the measures necessary for its achievement. How can the desired change be achieved? For example, is there a need for legislative or policy change? Is there a need for research, data and statistics? Is there a need for awareness-raising or advocacy? Etc. etc..

In many instances community leaders can be engaged to support disability awareness-raising initiatives or disability-inclusive planning in development projects.

Q7. **Should the Government/TRAI direct the telecom and broadcasting service providers to provide information pertaining to billing, usage, pricing and contracts in the form accessible to PwDs? Please provide a rationale for your response.**

Comments :

Yes.

1. As per the RPWD Act 2016, Section 42(i) appropriate Government should take measures to ensure that, all the content available in Audio, Print and Electronic media should be in accessible format.

2. In order to ensure end to end accessibility of services, it is important for service providers and hardware manufacturers to ensure accessibility as part of their products or services.

Q8: **Should the Government/TRAI mandate that the devices used for watching television provided through cable, satellite/DTH, fibre, etc. should be made accessible to PwDs?**

Comments :

Yes

India has the highest number of people with visual and hearing impairments. One out of every three blind people in the world lives in India - an estimated 15 million blind people live in India. There are 5-15 million deaf people in India. There are approximately 3 million deaf children in India. About 25,000 children are born deaf every year. By 2050, India will be home to one out of every six of the world's older persons, and only China will have a larger number of elderly people, according to estimates released by the United Nations Population Fund . (From http://mospi.nic.in/mospi_new/upload/elderly_in_india.pdf and http://www.thehindu.com/news/national/concernsover-an-aging-india/article3972671.ece) The elderly population faces problems of reduced

dexterity, hand strength, cognition and vision. The needs of this significant population have to be included to achieve growth in the truest sense.

Television is important for enhancing national identity, providing an outlet for domestic media content and getting news and information to the public, which is especially critical in times of emergencies. Television programmes are also a principal source of news and information for illiterate segments of the population, some of whom are persons with disabilities. In addition, broadcasting can serve important educational purposes, by transmitting courses and other instructional material.

In addition to radio and acoustic sirens, television is an emergency channel used to make public announcements. These contain alerts about the risks of an impending disaster such as an approaching tsunami or an explosion at a chemical or power plant etc..

As per the the THE RIGHTS OF PERSONS WITH DISABILITIES ACT, 2016 The Authority has power to mendate : —The service providers whether Government or private shall provide services in accordance with the rules on accessibility formulated by the Central Government under section 40 within a period of two years from the date of notification of such rules: Provided that the Central Government in consultation with the Chief Commissioner may grant extension of time for providing certain category of services in accordance with the said rules

Time limit for making existing infrastructure and premises accessible and action for that purpose.—(1) All existing public buildings shall be made accessible in accordance with the rules formulated by the Central Government within a period not exceeding five years from the date of notification of such rules:

Provided that the Central Government may grant extension of time to the States on a case to case basis for adherence to this provision depending on their state of preparedness and other related parameters.

As per the the THE RIGHTS OF PERSONS WITH DISABILITIES ACT, 2016, The appropriate Government should take measures to promote development, production and distribution of universally designed consumer products and accessories for general use for persons with disabilities

The Ministry of Information and Broadcasting (MIB) and TRAI can play a crucial role in making broadcasting services accessible to persons with disabilities by :

- Formulating law/regulation/policy/code which will ensure accessibility of broadcasting services   for persons with disabilities through a consultative process involving various stakeholders.

- Funding Research and Development of technologies that aid accessible broadcasting.

- Promoting public private partnerships to develop and deploy accessible broadcasting on a pilot   basis.

- Identifying a basic set of Broadcasting programs that shall be made accessible for persons with   disabilities over the coming year.

- Identifying private TV broadcasters that offer accessible programs and encourage them through   incentives such as awards, tax-breaks, concessions etc.

- Formulating India specific guidelines for Accessible Broadcasting.

Q9. **Should international accessibility standards be adopted for telecommunication and broadcasting services and devices in India? Please suggest steps required to ensure their adoption by the service providers/device manufacturers.**

Comments :

There are several accessibility features which could be added to landline and wireless phones to make them useable for persons with disabilities. Accessibility considerations need to be taken into account in four aspects, namely, hardware, software, services and content. Accessibility is not necessarily very complex or expensive and can often be provided by improving existing design and functions of devices so as to ensure effective access. A sample list of accessibility features is provided below for easy understanding :

Disability	Accessibility Features
Blindness /visual impairment	- Flexibility for adjustment of font size, colour contrast - Text to speech facility to read aloud the text - Screen Readers - Clear audio - Mini daisy player for reading books

	• Text scanning facility with optical character recognition software • Integrated GPS for geo-positioning • Large button phones
Deaf persons/persons with hearing difficulties	• SMS on landline phones • Sign language via video calls (especially on 3G networks) • Connection to hearing aids • Audio amplification • Flashing light on incoming call • Extra loud ringing tone • Captioned telephony relay service
Persons with cognitive disabilities	• Pictorial address books
Persons having difficulty in using the keyboard	• Voice recognition software

Apart from these, there are also several service related issues which are problematic for persons with disabilities. For instance, in India, the software for connecting to the Internet is often not navigable for a person relying solely on the keyboard. Another problem is the relative inaccessibility of telephone bills which

are generated for the customer. Hence, in order to ensure end to end accessibility of services, it is important for service providers and hardware manufacturers to ensure accessibility as part of their products or services. At present, accessibility solutions for persons living in India are few and expensive. This is largely due to the fact that the market for accessible goods in India remains unrecognized and hence most of the accessible software is developed in other countries. However, there is a very strong business case for creating accessible mobile phones for the mainstream market, because they cater not just to the needs of persons with disabilities, but also to those who are elderly, illiterate or have language barriers. A case study of **NTT Docomo's experience** in Japan illustrates this point which is as follow :

As is the case in many mobile phone markets, the penetration of mobile phones in Japan progressed very rapidly, reaching rates of over 80 per cent for the general population between 20 and 50 years of age as early as 2004. With such market penetration, attracting new customers became more difficult. NTT DoCOMo, whose market share is 51.3 per cent, identified the potential to attract new customers among elderly populations. While penetration of young adults was over 80 per cent in 2004, it was only 10 per cent for persons aged 70 to 80 and less than 4 per cent for persons 80 years or older.

Based on an in-depth evaluation of the reasons for non-adoption of mobile technologies among elderly persons, NTT DoCoMo identified the lack of accessible and assistive products and services as a key factor. Based on this finding, the company developed a comprehensive plan to adopt universal design across all activities of its product development and services divisions.

This meant developing accessible handsets for different types of impairments, offering customer service adapted to persons with disabilities and the elderly such as accessible point of sales with trained personnel in various adapted forms of communications, braille and sign language, tailored services for the elderly and persons with disabilities, and special marketing and rate plans.

The new product line which resulted from this effort, the "Raku-Raku", was launched in 2002 and has incorporated multiple accessible and assistive services, several of them benefiting from 3G services since 2005 such as:

- A large screen with large characters

- Dedicated buttons to call certain pre-recorded numbers automatically

- "Read aloud" menus and text

- Voice input for text messages and email

- Screen reader

- Access to a network of talking books (Bibulio-net, 12,395 titles as of March 2009) with an integrated DAISY player

- An optional bone conductor receiver to transmit sound waves directly from bone to nerve

The business results of this initiative have been stunning: NTT DoCoMo has sold over 15 million units of Raku-Raku phones since inception in 2002. Over half of those are 3G handsets. Penetration of mobile among the elderly has tripled between 2004 and 2008 and NTT DoCoMo has a much higher market share of the elderly market than its national average.

This case study validates the business benefits of addressing the needs of persons with disabilities and the elderly. It also validates the effectiveness of applying the "Three Tenets of Universal Design":

1. User centered: Recognizing the range of different capabilities and skills, past experiences, wants and opinions within the population.

2. Population aware: Understanding the quantitative population statistics is vital to inform design decisions.

3. Business focused: Achieving profitability in the commercial context and sustainability in the public context.

Accessibility has also been achieved through industry initiatives, including in Japan, while French mobile operators agreed to a code of conduct facilitated by the regulator.

Q10. What additional measures can be taken or technologies can be deployed by service providers or equipment manufactures to assist PwDs?

Comments :

Indian telecom sector has not yet recognized making accessible handseand services as a distinct need, there may be several accessibility features already existing in present day mobile phones which could benefit the disabled as well. Hence catering to customers who have disabilities need not necessarily be an entirely new exercise but may just require relooking at existing concepts and features to ensure that they are used to make handsets more accessible.

Senior citizens and people with physical or mental disabilities are often unable to access mobile phones because the equipment lacks the necessary accessibility features or because the price of the adapted phones and services remain unaffordable.

1. Mobile handsets 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 such as screen readers and magnifiers which can help users navigate menus and content.

2. Information about accessibility enhancing features can be provided by manufacturers on their websites.

3. Assistive technologies, such as screen readers from a third party, can often provide a better user-experience than the original handset-embedded application or voice synthesizer.

4. Manufacturers are now embedding high quality applications such as in the iPhone.

It is therefore somewhat surprising that enhanced-accessibility should remain a relatively undeveloped segment of the market. The technology to make mobile phones and services accessible is becoming more developed.

1. Screen readers can make mobile phoned accessible for the blind, those with low vision and the illiterate.

2. Visual or vibrating alerts, relay services and hearing aid compatibility devices make mobile phones accessible for the deaf and hard of hearing,

3.   Features such as voice recognition and auto text are needed by those with physical disabilities.

4.   New accessibility applications for smart phones are being developed and launched practically   every day. Affordability nevertheless continues to be a major issue, especially for smart phone   solutions.

Hearing :

Basic accessibility features and services Problem:

People who are deaf or hard-of-hearing are deprived of social interaction and unable to communicate by telephone because they cannot hear the caller or automated electronic messages, such as those of a customer care of an airline or banking service. Moreover, they are unable to access vital emergency services like requesting police or medical assistance.

Solution:

There are a variety of accessibility features and services which make it possible for the hearing impaired to make and receive calls on a mobile phone, ranging from basic features like provision of volume adjustment and speakers to provision of video relay services.

The Emporia Life Mobile Phone are designed for elderly users and includes, among various other accessibility features, SMS text messaging, a super loud ringer, a three colour visual alert, hearing aid compatibility, and adjustable volume control.

Conversations with sign language via peer-to-peer video can work on smart phones with 3G networks.

Accessibility features

Messaging options :

The most crucial function that a cell phone serves for the hearing impaired and the deaf community is to allow them to contact people in the form of text messages, either SMS (short messaging service), email or MMS (multimedia messaging service), thus offering an alternative to verbal communication.

Visual or vibrating alerts :

Mobile phones can be set to vibrate or give visual alerts to inform the user about incoming calls, emails, messages, calendar appointments, and wake up alarms, etc.

Adjustable volume control :

Especially useful for those who are hearing impaired as well as for enhancing functionality of hearing aids.

Call logs :

The display of missed or received calls which may have been missed by not feeling the vibrator or seeing the lights.

Visual or tactile indicators for the keypad :

Highlighting the buttons pressed on the keypad through either lights or vibration, will confirm actions being taken.

Text Teletypewriter (TTY) :

This is a dedicated device that is used for transmitting typed text conversation over telephone lines for those who cannot use spoken conversation. The deaf, hard-of-hearing or speech impaired communicate with these devices by sending and receiving text messages in the same manner that regular phone calls

are made and received when TTY machines are used at both ends of the conversation.

Multimedia Messaging Service :

While messaging originally began with only text, there is a whole range of multimedia messaging options available today, for instance, sending pictures or videos using mobile phones. The threaded message-view in most 'smart phones' enhances the texting experience. This is an especially important feature for deaf users who are illiterate and rely primarily on communications via pictures or sign language.

Mono Audio :

This feature transfers both left and right-channel audio content to both ear buds of headphones and makes listening to music and making calls easier for people with hearing loss affecting one ear.

Video conferencing :

This is yet another feature increasingly available on smart phones that has significantly enhanced the means of communicating for the deaf and hard of hearing. Face-to-face calling (video calling) is simpler to use over 3G and WiFi networks. Deaf persons can now communicate instantly and more effectively using video chat via sign language instead of relying on texting.

Captioning :

Many mobile phones, such as the iPhone, support playback of videos and movies with closed captioning, open captioning, and subtitles. While closed captioning refers to the display of transcribed audio to people who specifically request it, open captioning means display of transcribed audio for all.

Accessibility Services :

Relay services :

Relay services are human operated services for media and mode translation during phone conversations.

SMS-to-Avatar translation (Tunisia) :

WebSign is a project of the University of Tunis, based on the technology of avatar (animation in the virtual world). The software converts typed text into real-time, online interpretation in sign language with the help of a dictionary of words and signs. The dictionary has a very simple interface and even allows persons to create their own signs and words. The service facilitates communication between those who do not know sign language and illiterate deaf users and can also be useful for children learning sign .

Issues :

Automated customer services :

Systems need to be implemented to ensure that the deaf and hard-of hearing are able to access automated customer services that require users to listen to several automated options and then select a channel of service using the keypad.

Cost :

Persons with disabilities, including the hearing and visually impaired, have to use high-end mobile phones since they are the only devices that support accessibility features and services. This results in technology not being affordable to many persons with disabilities.

Vision :

Basic accessibility features and services Problem:

Persons who are blind or have low vision are unable to see screens and hence cannot use touch screen keyboards or access contact lists to call numbers stored in the address book, send and receive messages or navigate the keypad and menu.

Solution:

People with visual impairments rely - either fully or partially depending on the level of impairment - on a screen reader to make use of a computer or a cell phone. A screen reader is software that translates and converts information displayed on the screen into speech, non-speech sounds and Braille for a Braille display. Newest generations of touch screen phones come with gesture-based screen readers. This allows users with visual impairments to hear descriptions of functions on their phones through touch and also allows them to drag and tap to control their activities.

Accessibility features :

Following are the accessibility features should be available on mobile handsets.

Mobile handset accessibility features for the visually impaired

Feature	Description
Tactile markers	These markers help orient fingers on the keypad –the raised dot on the number five on telephones and mobile phones helps users to navigate the keypad.
Audible or tactile feedback	Confirms that a button is pressed. For example, provides audio alerts and feedback for functions such as when voice mail is received or phone is turned on.

Adjustable font sizes	This feature enables the user to increase font size when required to suit user needs.
Screen readers	Used extensively by people with visual impairment to operate computers and mobile phones. While some mobile phones have a built-in screen reader, it is also possible to equip a mobile phone with a third party screen reader.
Voice synthesizer feedback for touch screens	Voice feedback allows users of touch screen handsets to hear the description of the icon under their finger tip. When in voice feedback mode (such as Voice Over with iOS), touch screens are typically frozen so that users can explore icons. Special gestures such as three fingers at a time are necessary to trigger the sliding of screen pages when in voice feedback mode.
Audible cues	Noises used to indicate specific services or features, such as: low battery, caller waiting or ending a call, adjusting volume level, etc.
Adjustable brightness / contrast controls	Allows the user to customize the display to meet individual needs. Display colours, for example, can be reversed on BlackBerry smart phones. Depending on the comfort level of a partially sighted user, the foreground and background colours can be changed from light to dark or vice versa. Colours can also be converted to shades of grey.
Changeable size for	The size of the displaying area can be changed to suit user

main display	needs.
Backlit display	Backlit display facilitates viewing in poor lighting, indoors and outdoors.
Basic text-to-speech functionality	For example, this feature can be useful when checking caller ID and reading text messages.
Scanner and OCR (Optical Character Recognition):	Provides highly accurate print-to-electronic text conversion.
Screen magnifiers	Magnifying screens allow users with low vision to enlarge fonts and images. Essential for those with a limited degree of usable vision. The picture in Figure 1.6 shows an example of the magnifying function.

Accessibility services :

People with low vision can also benefit from a variety of services such as digital libraries and GPS enabled path finding applications.

Dexterity – Basic accessibility features Problem:

Persons who are unable to use their limbs, or flex their arms/fingers easily due to a disability/ impairment will not be able to press or otherwise physically navigate buttons on a mobile phone. **Solution :**

They need to be able to use the phone with minimal use of hands and should benefit from advanced speech recognition software that will help them undertake basic communication using a mobile phone.

Accessibility features :

Voice recognition :

Quadriplegics and people with limited dexterity rely heavily on voice commands for working on computers and cell phones for placing calls, writing text messages, composing documents, opening and closing applications, making calendar entries and setting reminders, playing music and videos, and surfing the web.

Auto Text :

Messaging for users with limited hand movement is possible by using AutoText that replaces particular text with preloaded texts to reduce the number of keystrokes needed to type the message. **Other :**

Sensitive touch screen phones can benefit users with movements limited to their fingers. For people who may have trouble holding mobile phones steady (such as people with Parkinson's, nervous disorders, hypothyroidism or elderly people), downloadable applications make it possible to take clear pictures by adding 'anti-shake' functionality to standard mobile phone cameras.

Additional useful features for dexterity impaired users include:

• Call answer by pressing any key.

• Enabling the user to lock modifier keys on QWERTY keypad phones to perform with a single   keystroke actions requiring multiple keystrokes.

• Voice activated answering with a speakerphone.

• Candy bar design to avoid extra movements that a phone with a folding or sliding design   requires; the extra movement of unfolding or sliding open the phone to speak is difficult for   persons who have impaired dexterity.

- Flat back on the phone to allow for operation on a table top rather than having to be held.

- Optional accessories such as a Bluetooth headset or keyboard, to make texting and talking   easier; wireless headsets aid call management without the need to press numerous buttons.

- Ergonomic grips and skid-free casing for improved stability.

Cognition :

Basic accessibility features Problem :

People with cognitive disabilities struggle to carry out one or more functions that are performed with ease by an average person. Depending on the type of disability, a person may have problems related to memory, analytical skills, attention, reading skills, mathematical or computational comprehension, reading comprehension, and communication.

Solution :

It is important to have a clear and simple user interface (UI), and consistent UI elements for easy selection of options.

Useful accessibility features for people with cognitive disabilities

Feature	Description
Predictive Texting	The phone's text editor predicts words as they type, thus making it easier to compose messages.
Speech recognition	This has become highly accurate and most voice dictation applications have the capability of recognizing various accents.

Text-to-speech	The ability to convert displayed electronic text into speech removes the anxiety associated with reading contact names, caller ID, messages, emails, instructions / directions, textbooks and much more. Phones with high-resolution cameras provide the option of converting printed text into electronic text with a single click. This text can then be read aloud using text-to-speech applications, enlarged for a clearer view or even highlighted and heard simultaneously.
Built-in calculator and schedule reminders	Built-in schedule reminders with audio, visual and vibrating alerts help users to remember future events and to perform tasks. Synchronizing with desktop-based calendars like Microsoft Outlook and Google Calendar is especially useful.
Larger display screens and formatting options	For text that allows users more spaces between each word (so that each word is highlighted boldly and in bigger font) along with increased brightness makes reading easier and more pleasurable.

Some other features that make access easier for persons with cognitive disabilities are :

•	Clear and easy to understand instruction manuals.

•	Menus with simple and prominent icons and navigational ease, providing 'to-do' instructions when input is required from the user.

•	Providing enough time for people to enter required information.

•	Ability to associate photos with telephone numbers.

•	Choice between audio, visual or vibrating alerts to let users know when they are receiving a call. • Highly pictorial visual display to enable ease of use for non-readers.

•	Ability to store emergency contact details.

•	Provision of audio, visual and /or tactile feedback upon pressing the keypad.

•	Pre-recorded voice commands for popular functions.

•	Predictive Help menus.

•	Keypad shortcuts to make every step quick and efficient.

Illiteracy :

Looking beyond disability :

	Although illiteracy is not classified as a disability, its prevalence among disabled persons and notably the visual and hearing-impaired communities in developing nations deserves special attention. It is also important to note that a number of features designed for persons with disabilities may help illiterate persons use a mobile phone with greater ease and understanding, which in turn

enhances the business case for service providers and handset manufacturers to include accessibility features.

Some accessibility features are relevant for illiterate persons as described in Table

Feature	Description
Intuitive UI	An intuitive user interface that is largely understandable based on graphical icons facilitates the use of mobile phones.
Audio-based interface	A primarily audio-based interface has to support not only the native language of people with limited literacy skills, but also their local dialect for convenience and ease of use.

Other useful features include :

• Audible or tactile feedback for the keypad.

• Ability to associate photos with telephone numbers.

• Keypad shortcuts.

• Voice recognition.

• SMS to Avatar translation for the hearing impaired illiterate (Tunisia10).

In addition to such features, innovative use of smart phones can also help people gain literacy skills around the world. For instance, Celedu (Mobile + Education) has started a project in this direction in India by spreading language skills and other learning content through downloadable games on mobile phones.

Special services by Service providers :

Tailor-made plans for the deaf :

Cell phone plans are now tailored for the deaf so that they pay only for messaging and not for voice calls. In addition to such "text only" plans, some operators also offer "text and data" plans without voice as in other bundled options. This allows deaf users to enjoy special payment plans for mobile data services. T-Mobile6 in the United States (US) has come up with a "data only" plan that offers the freedom to pay only for text and not for call minutes. AT&T also has its own Text Accessibility Plan (TAP) for select smart phones as well as non-smart phones.

Digital libraries for visual or reading-impaired users

Global Positioning System (GPS)

Lack of information to navigate streets is a major barrier to independent mobility for the visually impaired. Mobile phones have become a source of GPS information through the use of built-in GPS receivers, and in most cases freely available maps. Information displayed on these maps must be accessible with a compatible screen reader in order to benefit the visually impaired. GPS which announces the nearest points of interest and your current location. Braille readers can also output text to a refreshable display connected wirelessly to their device with Bluetooth technology.

GPS software allows users to:

• Pre-plan their travel route; especially helpful to decide the mode of transportation and the duration of travel;

• Explore their surroundings with the 'announcement' of nearby addresses and   points of interest;

- Announce the current location of the user with a reasonable degree of accuracy;

- Give notifications regarding intersections, street exits, and other vital details while walking;

- Provide turn-by-turn directions;

- Access voice-based guidance systems.

There are numerous examples of accessible GPS applications.

Relay services

Relay services are human operated services for media and mode translation during phone conversations. They are usually given financial support through universal service/access fund mechanisms mandated by governments.

Text relay services are traditional relay services for TTY devices that translate between text-to-speech or speech-to-text, usually for people with speech impairments, hearing difficulties, total hearing impairment or hearing and visual impairment.

Speech-to-speech relay services support speech calls for users with speech impairments or cognitive disabilities.

The different types of relay services are:

Video relay services (VRS) is used to enable sign language communication between a hearing or speech impaired person using a sign language interpreter and a videophone/ webcam and anyone who owns a regular phone.

Text relay services are traditional relay services for TTY devices that translate between text-to-speech or speech-to-text, usually for people with speech impairments, hearing difficulties, total hearing impairment or hearing and visual impairment.

Speech-to-speech relay services support speech calls for users with speech impairments or cognitive disabilities.

Captioned speech relay services (captioned telephony or CapTel service) translate real-time conversation into captions and is useful for people who can communicate orally, but have difficulty in hearing. Real-time captioning provides both voice and text forms of conversations.

Instant Messaging (IM) relay is a text-based solution on mobile phones for individuals who are hard-of-hearing, or have speech loss. In the United States, AT&T offers IM relay for hard-of-hearing users, using AOL IM services.

To relay with one-step dialing, users send the phone number they are dialling via instant message to a screen name "AT& T Relay." An AT&T relay operator calls the phone number and translates the text to voice to the other party. There is no charge to use this service, but users must register.

This solution is also available on several mobile platforms on which AOL is available. Customers are given a personal 10-digit phone number which people can call via the AT&T IM Relay. Customers can also use an Internet connection and an AIM account on their computers and laptops.

Requirements for the integration of relay services:

- Calls to a number for a person with disability should be able to automatically connect through a relay service selected by the user if the user so decides.

- Calls from a person with a disability to another number should be able to connect through a relay service selected by the user if the user so decides.

- Calls between two users who can and want to use the same mode of communication (text/voice/video) during the call should be possible without any relay service.

- Relay services should work with all commonly used handsets and terminals.

- Users should be able to use the same phone for calls in those modes they handle themselves, as for calls placed through relay services and to emergency services.

- Advanced video relay services and peer-to-peer video for sign language should be available on regular mobile phones with video transmission capabilities.

- Relay service should cost no more than a regular phone call.

Independent living

Since wireless technologies provide easy and instantaneous access, persons with disabilities can use them in a variety of ways to live independently and conduct their daily activities. Provision of hands-free capability, screen reading and text-to-speech functionality, relay services, Internet browsing, home automation, emergency response and all the assistive features and services should promote independent living for persons with disabilities.

In addition to enabling them to perform tasks such as paying bills, shopping, booking tickets, reading books and working, mobile phones also impact the social fabric of the disability community.

Customer services

Customer service is a critical component of any program offered by service providers to reach out to the community of disabled mobile phone users. Major

success stories and good practices are well established by mainstream international service providers. Some examples are:

• **Orange** has an accessibility charter expressing its commitment to accessibility and mentions among other things that it has made both its internal and external websites WCAG (Web Content Accessibility Guidelines)- compliant and also developed a dedicated distribution network to improve access to its special offers by disabled users and older people with disabilities.

• **AT&T** offers several services for users with disabilities. For people with visual impairment, it offers services like Braille and large print billing and free voice dial. Free local directory assistance is also provided. AT&T also has dedicated customer care centers to assist disabled customers such as the National Center for Customers with Disabilities for AT&T Mobility and the AT&T Sales and Service Centre for Disability and Aging for AT&T's landline customers. These centers can arrange for an alternate billing format such as Braille or large print and can advise customers with hearing, vision, mobility, and/or speech disabilities about equipment, accessories, features and calling plans.

• **Both AT&T and Orange** also train their staff about accessibility features and the needs of persons with disabilities.

• **NTT DoCoMo** implemented accessible distribution and customer service processes as part of its Universal Design strategy. Its concept of "Hearty Plaza", a series of stores designed with a number of accessibility features, has been most successful in promoting its "Raku-Raku" accessible mobile phones and services among senior users and persons with

disabilities. Dedicated stores include fully accessible floors, indoor directions by artificial voice guide, accessible counters and toilets, and are operated by sign language proficient staff, with a number of accessible services such as Braille peripherals and documentation, or a concierge service for assistance.

An additional good resource is the Mobile Industry Good Practice Guide for Service Delivery for Disabled and Elderly Customers in the United Kingdom (UK). Endorsed by all major mobile service providers, it covers all aspects of accessible customer service including recommendations for the retail environment.

Q11 Should device manufacturers be mandated to allow in their device's operating system those applications which are meant to assist PwDs? Please justify your response.

Comments :

Yes. Net Neutrality.

It is mandated in the THE RIGHTS OF PERSONS WITH DISABILITIES ACT, 2016

❖ Today, there are companies engaged exclusively in the business of making iPhone/Android applications, in addition to the several thousands of hobbyist developers writing code for these applications. Application markets (Apple's App store / Nokia's Ovi Store/ Android Market/ RIM's Blackberry App World) are popular locations for developers to feature their

applications and for users to download them. However, an increasing number of app stores offer alternative options for users.

❖ Applications can replace multiple devices worth thousands of rupees offering tremendous cost advantage.

❖ Very useful for the physically challenged people in different areas like education, e-books, for parents and teachers of autistic children etc..

Q12. What measures can be taken in India so that emergency services are made   more accessible for PwDs? Should the implementation of these measures   by TSPs be made mandatory by the Government?

Comments :

Implementation of these measures by TSPs should be made mandatory as, it is mandated in the THE RIGHTS OF PERSONS WITH DISABILITIES ACT, 2016.

Making emergency calls can be nearly impossible for persons with disabilities, thereby restricting their ability to convey essential information pertaining to the emergency. Some of the ways in which this can happen are:

• Hearing and speech impaired people may not be able to call and request assistance.

• Visually impaired people may not be able to pinpoint the exact location where emergency assistance   is required.

• Under a stressful situation, people with cognitive impairment may not be able to fully explain the   emergency.

Emergency services thus need to be designed to accommodate these calls. Some of the ways in which this is done around the world are:

- In Europe, a single number (112) has been developed for placing emergency calls. REACH112 -- funded under European Union's ICT Policy Support Programme – allows disabled users to   communicate with each other as well as directly with emergency services using alternative means of communication including texting. Under the scheme, alternatives like IP devices will be supplied to   the disabled users to initiate simultaneous video, voice and text-based contact with the emergency services.

- The Australian government has initiated an SMS-based emergency service for the hearing impaired and hard of hearing community. They can now request assistance by sending an SMS to the national   emergency number 106.

- In the US, the Americans with Disabilities Act (ADA) requires all emergency service centres to have a Telecommunications Device for the Deaf (TDD) available for receiving emergency calls from similar   devices.   People with a hearing impairment using Video Relay Service (VRS) or IP Relay on their mobile phones can register and get 10-digit telephone numbers from their VRS or IP Relay provider   in   the   US   to   make   and   receive   calls, including calls to 911 emergency service centres.

- Emergency measures must ensure that the communications needs of people with disabilities and others with access and functional needs are

integrated into all parts of emergency planning at the local, state, tribal, and National levels.

• There are huge gaps and barriers in communication during emergencies,

It's important to provide visual information in their languages, so that everyone can be aware of what is happening before, during, and after a disaster.

• The plans made for special, at risk, or Vulnerable groups should be according the proportion of physically handicapped persons.

• Apart from this, Emergency preparedness to protect the physically handicapped persons from Disaster, Diseases, Bioterrorism etc. should be established.

Q13. Should the device/handset manufacturer be mandated to manufacture at least one model of handsets for PwDs which is having accessibility features and which are compatible with assistive technology features such   as hearing and visual aids including emergency buttons?

Comments :

Yes.

It is mandated in the THE RIGHTS OF PERSONS WITH DISABILITIES ACT, 2016

Disabled Consumer Rights to Access to information and communication technology according to the THE RIGHTS OF PERSONS WITH DISABILITIES ACT, 2016.—The appropriate Government shall take measures to ensure that,—

(i)   All contents available in audio, print and electronic media are in accessible format;

(ii)   Persons with disabilities have access to electronic media by providing audio description, sign language interpretation and close captioning;

(iii)   Electronic goods and equipment which are meant for everyday use are available in universal design.

Q14. How should companies be encouraged to utilize their CSR funds for development of applications, devices and services for the PwDs? What kind of devices and applications can be envisaged/designed to make achieve ICT accessibility for PwDs?

Comments :

Mentioned in other comments.

Q15. Should any other funding mechanism for the development of applications, devices and services meant for the PwDs be considered? Please give a rationale for your response.

Comments :

Creation of National and State Fund will be created to provide financial support to the persons with disabilities. The existing National Fund for Persons with Disabilities and the Trust Fund for Empowerment of Persons with Disabilities will be subsumed with the National Fund.

International Universal Service Fund (USF) Initiatives on Disability

Using the USF for bridging the digital divide for persons with disabilities is not an entirely new concept. A brief survey of neighboring countries such as Pakistan and Malaysia in the Asia-Pacific region, countries in Europe and Latin America and Australia reveals that several countries have already initiated USF projects on accessibility for the disabled. Even small countries like Jamaica and Pakistan have invested 6 million and 31 million respectively in the year 2009 on providing accessible infrastructure, facilities and services. The table given below provides an overview of the ongoing projects in different countries. Detailed information about each country is given in Annexure III.

USF accessibility projects	Countries
Supporting purchase of hardware and software infrastructure, accessible telephones, etc.	Jamaica, Pakistan, Australia, Ireland
Subsidies for broadband/fixed and mobile telephony	Portugal, Lithuania, Italy,
Billing in accessible formats	Czech Republic, France, Greece, Ireland, Italy, Lithuania, Netherlands, Norway, Poland, Portugal, Slovenia, Sweden, Switzerland, UK.
Special measures of access for	Czech Republic, France, Greece,

emergency situations	Ireland, Italy, Malta, Netherlands, Norway, Portugal, Romania, Slovakia, Slovenia, Sweden, Switzerland, UK, Australia.
Text Relay Services	Czech Republic, Germany, Greece, Hungary, Ireland, Italy, Latvia, Netherlands, Norway, Portugal, Slovakia, Sweden, Switzerland and UK.
Video Relay service	Germany and Sweden
Handsets with large keys for fixed telephony	Czech Republic, France, Germany, Greece, Hungary, Ireland, Italy, Lithuania, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Sweden, Switzerland and UK.
Quick dial and speed dial keys for mobile telephony	Czech Republic, France, Germany, Greece, Hungary, Ireland, Italy, Lithuania, Malta, Netherlands,

	Norway, Poland, Portugal, Romania, Slovakia, Sweden, Switzerland and UK.
Universal Service Provider (USP) as the main provider of text relay services	Czech Republic, Greece, Ireland, Italy, Netherlands, Norway, Portugal, Slovakia, Switzerland and UK.
USP as the main provider of special enquiry services	Czech Republic, France, Ireland, Italy, Latvia, Netherlands, Norway, Portugal, Slovenia, Switzerland and UK.
The USP as the predominant provider of handsets with accessible features for fixed telephony	Czech Republic, Greece, Hungary, Ireland, Malta, Poland, Portugal, Slovakia, Switzerland, UK.
USP as the main provider of information about accessible services and functions	Czech Republic, Greece, Ireland, Italy, Latvia, Malta, Norway, Portugal, Slovakia, Slovenia, Switzerland and UK.

Information about USO accessible services	Czech Republic, France, Greece, Ireland, Italy, Lithuania, Malta, Norway, Portugal, Slovakia, Slovenia, Sweden, Switzerland and UK.

International USF Initiatives on Disability

The following are outlines some of the initiatives of countries to utilize their USFs to enable access for persons with disabilities.

Jamaica

Jamaica's Universal Access Fund supports its e-learning project. In 2009, the fund was used to provide computers and audio-visual equipment worth $6million to six schools for deaf students in the country.[1] The schools were able to interact with one another through tele-conferencing using equipment such as desktops, laptops, video cameras, document cameras, projectors, desk jet printers, projector screens and workstations provided by Fujitsu Transaction Solutions.

Pakistan

The Universal Service Fund of Pakistan signed a $25million contract[1] with the Al-Shifa Eye Trust in order to increase accessibility to Information Technology and telecom for people with low vision and visual impairments. The following activities were outlined as part of the collaboration.

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http://www.jis.gov.jm/officePM/html/20091002T000000-0500_21351_JIS_UNIVERSAL_ACCESS_FUND_DONATES_ICT_EQUIPMENT_TO_THE_DEAF.asp

- Extending support to the low vision center at Rawalpindi hospital for expanding infrastructure, recruitment of trained professionals and provision of modern low vision equipment.

- Up-grading the low vision center at Sukkur, Sindh

- Establishing low vision centers on the lines of Rawalpindi and Sukkur at Kohat, Khyber Pakhtunkhwa.

The USF has also signed a contract with the Pakistan Foundation Fighting Blindness for digitizing its Audio World Library and establishing an Internet café at the Darakhshan Rehabilitation Centre and Islamabad.

European Union

The European Commission Universal Service Directive (Directive 2002/22/EC)[2] outlines specific rules for disabled users and people with special needs with regard to telecommunications. Member states of the European Union are duty-bound to take necessary measures to guarantee access and affordability to publicly available telephone services at a fixed location, such as ensuring that public pay phones are accessible to persons with disabilities, making available public text telephones for persons with hearing and speech impairments, providing directory enquiry/ telephonic assistance services free of charge for blind people and persons with visual impairments.

Under the EC Directive, member states can adopt region specific measures to guarantee adequate choice of telecommunication services and service providers to disabled users. Various telecommunication services for persons with

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[2]http://ec.europa.eu/information_society/policy/ecomm/todays_framework/universal_service/index_en.htm

disabilities have been implemented by the National Regulatory Authorities (NRA) of member states.

(Source: Electronic communications services: Ensuring equivalence in access and choice for disabled end-users- Body of European regulators for electronic communications)

EU Universal Service Directive in Practice – Examples from Member states

Czech Republic

Under the EU directive, the USP in Czech Republic is mandated to sell or rent fixed line electronic communications terminal equipment to persons with disabilities at the same price as standard electronic communications equipment.

France

In France, the USO is used to provide public pay telephones for end-users with disabilities with the following accommodations –

- ❖ A special button on payphones for blind users and persons with visual impairments with voice based server with pricing information;
- ❖ Publimintels or listening text public telephones for deaf users or users with hearing and speech impairments.
- ❖ 'Locomotor' disabled - devices without door, with lowered position or with a larger host.

Portugal

In Portugal, service end-users with hearing impairments need minimum pay towards their fixed handset service, with the remainder subsidised by the USP provider on a voluntary basis. This offer is facilitated through a foundation created by the USP that is geared towards research to accommodate the needs of disabled end-users.

Lithuania

The first 300 litas (approx €85) of the cost of a new handset every six years is covered by the state budget. In addition, Lithuania's USP is mandated to ensure that the total number of public pay phones that cater to the needs of disabled end users is no less than 10 per cent of all pay phones in the country.

These payphones must be equipped with instructions for users in large, easy- to read font and be illuminated when dark.

The USP also is mandated to install at least one textual public payphone in every disabled rehabilitation centre.

Italy

Italy's national regulator, Agcom has introduced a scheme of subsidies for services for persons with disabilities. Under the scheme, blind users can avail a 50 per cent waiver on their monthly Internet fee or use at no charge the equivalent of 90 hours of internet connection free.

Denmark

Denmark's USO mandates the provision of a Web-based text phone service and a PC-based text phone service. This includes a broadband connection of at least 512/512 Kbit/s to certain groups of disabled end-users.

Sweden

The Swedish NRA 3– The Swedish Post and Telecom Agency (PTS) and service providers are together responsible for fulfilling Sweden's USO. The NRA provides services such as text and video relay, directory information and emergency services, specialist terminal equipment and accessible billing systems to persons with disabilities.

The NRA also finances projects for devising innovative communication solutions in electronic communication that can accommodate the needs of persons with disabilities.

This includes the SMS112 project: distress calls to emergency number 112 using text a message which is in trial state. The project is evaluating the optimal use of text messaging by persons with hearing disability or speech impairments to notify an SOS alarm by calling the emergency number 112 in the case of an emergency.

Other trial projects include Audio 4 all: tools for the distribution and navigation of audio information which looks at testing flexible mediums for dissemination and use of audio information by people with reading disabilities

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[3] http://www.pts.se/en-gb/

through computers, cell phones and broadband television and digital streaming of audio books and papers to cell phones.

Chile

Chile's Telecommunications Development Fund[4] was established under the 1994 Universal Access Policy[5] of the Chilean Government. The fund recognizes the stipulations of the United Nations' uniform standards on equal opportunities for persons with disabilities which states that member nations must take measures to ensure that information and documentation services are accessible to persons with disabilities.

A commission comprising disability organizations and telecom service providers was set up under Chile's Department of Telecommunications (the National Disabilities Fund), to strategies`   on national policy to enable and expand access for disabled users.

Australia

The definition of standard telephone service (STS) under Section 6 of Australia's Telecommunications (Consumer Protection and Service Standards) Act 1999 mandates the provision of alternate communication which is equivalent to voice telephony to be provided to citizens who are disabled. Telstra[6], Australia's only universal service provider is mandated to provide an STS (or equivalent) to all people in Australia as per its universal service obligation (USO). This implies that

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[4] http://www.summit-americas.org/SIRG/1999/XVI/Telecommunications-XVISIRG.htm

[5] http://www.itu.int/ITU-D/treg/Events/Seminars/2005/China/Documents/06-Christian%20Nicolai%20(new).pdf
[6] http://www.acma.gov.au/WEB/STANDARD/pc=PC_2491

alternative forms of communication for deaf people or persons with hearing or speech impairments such as text tele-typewriters, volume control phones, and hands-free phones are also part of Telstra's USO with regard to STS.

Australia's USO[7] also has a priority assistance service mandate in place. This service aims at assisting persons with diagnosed life-threatening medical conditions who depend on a reliable, home telephone service to be able to call for medical assistance should the need arise. Under priority assistance, customers who are identified for the service are entitled to faster connection and repairs on their telephone services and a greater level of reliability.

Service providers must provide connections or carry out repairs for priority assistance customers within 24 hours in urban areas and 48 hours in remote areas. Customers who experience two or more faults on their telephone service within a three months period are entitled to have their connection tested by the provider. Telstra, AAPT and Primus are among the service providers who offer priority assistance services.

Ireland

Ireland's USP, Eircom is obligated to undertake the following measures for the benefit of users with disabilities.

- Provide a dedicated section of its website, accessible from the homepage, with information on the services which affect persons with disabilities.

- Maintain a code of practice regarding the facilitation of services for persons with disabilities which will be subject to periodic review.

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[7] http://www.acma.gov.au/scripts/nc.dll?WEB/STANDARD/1001/pc=PC_2413

- Provide inductive couplers for users who are hearing impaired so that they can connect their hearing aids to the telephone and hear incoming speech clearly. Eircom is also required to provide them with amplifier phones to increase volume of incoming speech and tele-flash visuals that can indicate an incoming call.

- Provide text relay service which will enable the receipt and translation of voice messages into text.

- Put in place rebates for text telephone calls.

- Provide push button telephone sets with speed and automatic redial buttons which will allow pre-programmed telephone numbers and hands free phones to be used by people with dexterity problems.

- Provide restricted vision telephones for people with visual impairments and provide them with Braille billing free of charge.

- Assure alternative directory enquiry arrangements free of charge

Q16. How can effective campaigns be designed to create awareness about use of ICT accessibility tools? Can such campaigns be funded by CSR funds? If not, what other mechanisms can be used to fund such campaigns?

Comments :

- By empowering Consumer Organizations.

- The TRAI should fund several projects to promote accessibility across various telecommunications devices and services such as mobile phones, fixed landline phones and Internet connectivity.

- The Authority should 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.

- There should pilot projects to connect persons with disabilities in rural areas yield positive results, it would be desirable to expand the charter to include Rural and Urban areas, where persons with disabilities experience a similar lack of accessible ICT products and services.

Q17. Should the Government incentivize the manufacturing and development of ICT tools and devices viz. tools for mobile accessibility, TV accessibility or for web accessibility for PwDs? Please give a rationale for your answer.

Comments :   Yes. Mentioned above.

Q18. Please give inputs/suggestions/comments on any other issues which you feel are relevant to the subject matter.

Comments :

The Web Content Accessibility Guidelines 2.0 (WCAG 2.0) brought out by the World Wide Web Consortium (W3C) covers a wide range of recommendations

to make the web content more accessible. Following these guidelines will make content more accessible to a wider range of people with disabilities including blindness and low vision, deafness and hearing loss, learning disabilities, cognitive limitations, limited movements, speech disabilities, photo sensitivity and combinations of these.

Here is an example of how the WCAG standards of accessible websites has been applied in various countries:

Criteria	US	EU	Korea	Philippines	Australia	Thailand
Type of Policy	Legislation	Council Resolution + Action Plan	Legislation	Working group currently formulating policy	Legislation + Advisory Notes	Policy + guidelines
Effective From	1998, 2010	2002	2007	N/A	1992, 2002, 2010	Not available
Scope of Coverage	Web and other infrastructure as well	Includes other electronic infrastructure	Web and other infrastructure as well	N/A	General legislation with web specific advisory notes	Web accessibility guidelines
Complian-	Partly	Yes	Yes	N/A	Yes	Partially

ce with WCAG					compli-ance with WCAG 1.0s
Applicabili-ty	Only Federal Departm-ent and related agencies	Public Sector Websites of the Member States	Both private and public sector gradually by 2015 as per the current roadmap	N/A	Any individu-al/ organiz-ation creating a web page (Govern-ment & Private)	Guideli-nes targeted at both the private and public sectors
Signatory to UNCRPD	Yes	Yes	Yes	Yes, signed and ratified	Yes and also signed and ratified the optional protocol	Yes, signed and ratified

(Dr. Kashyapnath)