



## **Policy Guidelines to Bridging the Digital Divide for People with Disabilities<sup>1</sup>**

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### **ABSTRACT**

In order to realize any Information technology initiative, special consideration should be given to disable segment of the population. The role of public and private sector is of utmost importance. Together with government initiative, private endeavors, involvement R& D organization and universities, the digital gap for have and have not can be reduce. Computer Literacy among disabled can be a very importance tool, as it can help overcome disability using Information and Communication Technology. This paper attempt to signify the role of ICT for people with disabilities, content of this paper includes major factor contributing Digital Divide, Digital Divide and different disabilities groups, recommendation to bridging the Digital Divide.

**KEY WORDS:** ICT policy making, Learning Disabilities Corporate Ventures, Accessibility Rights.

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### **1. INTRODUCTION**

Digital Divide is a phrase coined to refer the gap between “Have and Have not” in Information and Communication Technologies, In other words Digital Divide is the gap between those who has access to Information Technology resources and those who do not [1]. This digital divide is not limited to the absence of ICT Technologies but also to the inadequate access of Information. Most of the ICT resources are available worldwide but these resources have poor accessibility to different segment of the society Digital Divide is getting wider in developing countries, when is come to disabled versus non disabled, this divide is even getting wider. Some studies also showed decreasing trends of Digital Divide, especially in developed countries [2]. World community should recognize the fact that knowledge based growth is must for sustainable development.

Information and Communication Technology can play a vital role for the life of millions of disabled around the globe, ordinary task which otherwise not possible for people with disabilities can be perform using these technology, for example any physically challenged person can access huge information resources, do transaction through On-line Banking services, communicate through email, share views through On-line Chat rooms, utilized telemedicine for health care, and utilized leisure opportunities, like wise people with visual disabilities can access to web through specialized software which can translate web contents into audio file.

There is ongoing list of benefit to people with disabilities, which can only materialize when public sector such as Pakistan Telecommunication Authority together with other private sectors, initiate mega scale projects to facilitate ICT benefit to all segments of the society.

The biggest challenged to ICT Project in Pakistan is the poor Literacy Rate; over half of the population cannot even read or write their name. Even for rest of the literate population internet penetration rate is less than 5% and there is a grim picture for usage of ICT for people with disabilities. It is very challenging to bridge the digital divide. Government Authorities such as PTA, PTCL together with private sector should enforce policies to decrease the gap between have and have not. Some of the drastic steps include the awareness of Information Technology through electronic and print media, introduction of ICT in the earliest level of child learning, internet facilities to remote and rural area, special IT training program, Job placement of disabled person into various industries, Funding of ICT Project through different resources including BAIT-UL-MAAL and Interest Free Loans.

### **1. FACTORS CONTRIBUTING DIGITAL DIVIDE**

In the following section factors contributing digital divide will be addressed.

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### **2.1 Telecommunication Infrastructure**

Insufficient infrastructure is one of the major reasons behind widening the digital divide. Most of the rural and remote communities do not have telecommunication infrastructure to support any major ICT Project to the masses. In order to provide access to all segment of the population, different projects should start immediately to rural area as well as urban areas, such project include as Fiber optical link, for far and unreachable area wireless local loop could be an option. High Speed Internet connectivity should be subsidized to the less privilege individuals. Such infrastructure initiatives become a success when public sector joining hand with private sector project. For example Government sector should give tax break to private companies that provide internet connectivity to institutions such as libraries, school and vocational training centers for disables.

### **2.2 Socio Economical Factors**

Socio Economical Factors have great influence on Digital Divide, low income, minorities people with disabilities, women and senior citizen who have socio economical disadvantages are worst effected stakeholder of the digital divide. It is very unlikely that a poor disabled person has an internet access at his or her home. Digital Divide can reduce when economical condition of stakeholder improves.

### **2.3 Cost of Computer Accessories and Internet connectivity**

Even countries where Telecommunication infrastructure is adequate cost of computer accessories and Internet connectivity is one of the major issues. Any ICT initiative is meaningless without proper hardware, software and related facilities. Some of the recommendation to combat the issue of cost is to reused recycle computer, easy installment plans, import of cheap laptops and computer accessories. Priority should be given to public libraries, school and vocational training centers for disables where maximum advantages can deliver with minimum cost. In order to increase the connectivity Internet Service Providers (ISP's) should be heavily subsidize and ensure that these ISP's must provide good services at a reasonable cost.

### **2.4 Awareness and Social Issues**

Attitude of the society toward lesser privilege people with disabilities are not very encouraging, every disabled person have a right to access information and communication services. In order to break such attitude and cultural norms media should play it role by telecasting short teleplays and advertisements. Woman should encourage using information resources because this segment of the society is under represented in Information Highway.

### **2.5 Physical Access**

Physical access to ICT Facilities is a major concern for people with disability, especially for rural areas. Currently most of the facilities are not disabled friendly, person with disabilities face great difficulty during traveling. In order to benefit from any public sector project, existing building or new project should incorporate building code for accessibility especially in public areas like Libraries, School, and College. Some of the physical accessibilities include ramp access to the physical challenged person, brill's coded access for visual disabled. In case of emergencies, these building codes must make sure fast and convenient exit. Physical Access is also including the facilities of special transport service for disables.

### **2.6 Language Barrier and Digital Divide**

Language is also a key barrier which significantly affects the Digital Divide. Countries where English is not a mode of education, this barrier have affected information access, even though language translation facilities are there in the form of different translation software, huge information resources is not fully accessible, because of attitude toward learning a new language or lack of interest in using technology to translate information. One other reason for inadequate access is lack of good translational software. One of the possible solutions for this issue is to teach English to people with disabilities using special Language Laboratories; other possible solution is to provide translated information resources in different local and regional languages.

## **2. DIGITAL DIVIDE AMONG DIFFERENT DISABILITY GROUPS**

Renowned Noble Prize winner Prof Stephen Hawking famous for his work in astrophysics [3], because of ALS (Amyotrophic Lateral Sclerosis) [4] disease he does not have ability to walk and talk , still he is the author various famous books and research journals. He performs most of the task using a special laptop mounted on his wheel chair. He and various other disables are the role models for people with and without the disabilities. It is the courage of individual and the power of Information and communication technology that these people are contributing to the society, which was not possible in the past.

It is a reality that only a few segments of the masses in Pakistan have Internet access, which especially true for disable people who either does not have access or don't have means to afford Internet facilities, even with Internet facility available at their home they require additional support which may involve modified /alternative key board, mouse, computer screen for proper use.

In this section we will discuss different types of disabilities and it affects on Digital Divide.

### **3.1 Digital Divide for Learning Disabilities**

Traditional learning resources are not adequate enough for this segment of disability group. In order to harness ICT for people with Learning disabilities teacher should be well trained in new teaching methods, which should design to keep the need for special people in mind, specially the content of these resources should reflect cultural and lingual aspects. Information technology can provide access to new state of the art resources in the form of easy interactive websites for people with learning disabilities at the comfort of their home.

### **3.2 Digital Divide for blind or have visual impairments**

Little has been done to bridging the Digital Divide for people with visual disabilities, In this area a lot of research should be require. I hope that in near future science and technology should devise methods to translate internet resources into audio files and speech into internet resources. Human assistance in this matter can greatly overcome accessibility issues for people with Visual disabilities. Volunteer program should also devise so that any visually challenged person can access to information resources.

### **3.3 Digital Divide for Aphasia**

Aphasia [5] is a form of communication disability, which includes different degree of disabilities in verbal expression, listening comprehension, reading and writing. Aphasia is kind of disability due to physiological and cognitive impairment. Few symptoms and sign of Aphasia include inability to speak words, comprehend speech, read or write. In certain traditional situation these kinds of disabilities may cause frustration and anger. These different degrees of communication disabilities may cause a social barrier for individual to communicate in ordinary situations. Through ICT it is possible for people with Aphasia to communicate and perform daily routine task.

Individual or School who caters people with Aphasia can incorporate ICT training in the academic curriculum. The requirement for ICT training is not very different from those of non disable people except some modified keyboard, mouse and screen are essential, together with special techniques and mode of delivery.

## **4. RECOMMENDATIONS: BRIDGING THE DIGITAL DIVIDE**

### **4.1 Policy Guidelines and Legislation on ICT**

People with disabilities should always give fair participation in all phases of policy and decision making. Any initiative in the absence of people with disabilities may end up in failure therefore in order making effective policy legislators should fully involve different type of disability groups in every phase of decision making and implementation.

### **4.2 Better connectivity**

Better connectivity means all available information resources should be accessible 24 hours a day, 7 day a week with no or minimum interruption. With latest technology for example wireless local loop, rural and remote area can easily provide access to their community. As more and more internet application becomes Bandwidth hungry, Internet connectivity should provide higher data rates.

### **4.3 Wider Reach**

In order to ripe the benefit of ICT internet connectivity should be accessible to wider Audience including Youth centers, Libraries, rehabilitation centers, Social Welfare centers, Religious school in both rural and urban area.

### **4.4 Easy Access of fund for ICT**

Government Sector must facilitate the funding from different resources like BAIT-UL-MAL, Educational Grant and other fund to the various deserving person and organization. These funds should in the form of qurz-e-hasna or loan with very easy installments. Micro Financing is one of the better way to fund ICT project.

### **4.5 Disabled – Friendly Web site and Internet resources**

There has been a need of “**One stop shop**” web resources for all disabilities groups, key feature of this web site include News room , On-line community platforms, complaint center, links to vocational centers, government agencies, social welfare clubs, employment agencies, technologies for disable and so on.

Web sites for Disabled should easy to accessible to all possible kind of disabilities, keep in mind the need of individual groups for example for visually impaired website should enhance to accommodate different level of visual disabilities using different Visual icons,

One such initiative is Web Accessibility Initiative User Agent Accessibility Guidelines (UAAG) 2.0 which was launched in March 2008 [6]. This initiative explains how to make internet browser and multimedia player accessible to people with disabilities. For physically challenge individual alternative key board and mouse should be provided. For reference please check one of the government web sites for disabled in UK. <http://www.direct.gov.uk/en/DisabledPeople/index.html> [7], such initiative could directly benefit the larger population of disability.

### **4.6 Web site and Internet resources for Disabled Children**

Computers and Internet is a fast learning media for children, therefore these Information Technology resources should be a part of Disabled children education and entertainment program. Web sites for young disabled should design in such a way that these children enjoy learning new concepts.

#### **4.7 Wireless Technologies for people with Disabilities**

Wireless devices have a major benefit of mobility and convenience compare to internet access. For the 6 years cellular and wireless connectivity outnumber internet access, comparing to neighboring countries the mobile phone penetration rate in rural and urban area are quite impressive.

Most of the wireless subscribers use voice and sms for day to day communication purpose, application of wireless broadband are very imminent which can open the door for global information. Wireless Companies like Ericsson, Nokia, Huawei, and Alcatel have major contribution in research and development. With the advent of 3G technology wireless internet connectivity is around the corner.

Specialized Mobile Hand held devices are already in the market. Wireless and Telecommunication manufacturing companies already launched plethora of gadget and application which can be a helpful tool for different disabilities, for example voice activated services can greatly reduce the burden for physical, visual or cognitive disabled persons. Through voice activated services a disabled person can speaking the name or the number of the contact person in his phone book. Likewise large cell phone screen might be help for people with visual limitations. With research and development most of home appliances can be control using wireless devices, for example one can use his mobile phone to lock unlock doors, control electronic devices etc.

#### **4.8 Artificial Intelligence based GPS System for Visually Disable person**

Global Position System is a satellite based location tracking system, with the help of latest engineering in Artificial Intelligence location tracking is possible which can greatly help blind and visual impair person to perform outdoor activities.

#### **4.9 ICT Product Compliances**

Traditionally websites are loaded with complex menu, graphics and multimedia application. Different ICT Product such as web sites, computer accessories should compliance using automated tools with standards codes.

#### **4.10 ICT Resources Centers**

Specialized Resource Centers could be a very drastic approach to bridging the Digital Divide. Graduate from these centers should associate with industry and research activities to deal with the issues related to their community. There is an acute need of ICT training centers for People with disabilities, these training centers not only involve in human resource development but also facilitate their talent to different public and private sector. Establishment of these Training incubators across the country, is gigantic task and it infrastructure include latest technology for example modified/alternative keyboard, mouse, special monitor, software and hardware accessories. It is estimated that, senior segment of the population will increase rapidly by the year 2020 [8], so does the age related disabilities [9]-[12]. ICT resource center should also cater the need of growing senior citizen for facilitating access to information.

### **5. KEY FEATURES OF ICT RESOURCES CENTERS**

#### **5.1 Free and Convenient Accessibility to internet Kiosks**

ICT Resources centers should be equipped with specially design internet kiosk for different disability group.

#### **5.2 Training Program**

Specialized training program should devise to train different disability group for example for physically challenged people special care given to the physical handling of computer devices such as key board and mouse. Alternate Keyboards are design for these purpose for can be modified according to the individual need.

#### **5.3 Job opportunities**

Graduate from these centers can work for Call center, Customer Care, Schools, Colleges, Universities, Banks, Rehab Centers and other institutions. These training centers should also offer short training program for seasonal and contractual jobs such as tax filling etc.

#### **5.4 Learning and Leisure Activities**

In order to make the atmosphere congenial, these ICT Facilities should equip with digital Libraries, audio video resources, magazine newspaper and so on.

#### **5.5 Self Help Communities**

These ICT resources center could be a platform for self help, where experienced members can volunteer to other members of the community. In this way these center becomes the social clubs for disable individual with special skill and attitude to educate the society.

#### **5.6 On-line Digital Communities**

On-line Digital communities are similar to self help communities except to the fact that they are physically live across different geographical locations. Though these communities speak different languages, have different culture but there interest are common, these communities could be good sources of learning and problem solving platform.

#### **5.7 ICT Hot line and Toll free Access for Disabled**

Hot line and Toll free Access is one the ways through which disabled person access and speak with a specialist in different department. These departments are responsible for providing assistance in number of area including health care, employment, education and other services.

### **5.8 Post Secondary and Higher Education for People with Disabilities**

ICT could become a major contributor for Post Secondary and Higher Education, if special care and incentive provide to disable students who want to continue their studies through On-line Educational Institutes. Curriculum of these On-line Degree and Certificate program should cater for special need of different disable group. Graduate from these program not only contribute to society but also take part in direct involvement in different educational levels.

### **5.9 Post Secondary and Higher Education for People with Disabilities**

Allama Iqbal Open University and Virtual University are major contributors in Post Secondary and Higher Education for People with Disabilities. These institutions have special programs for disable communities which is accessible through different medium such as TV Broadcast, Internet, CD's, and Video etc. These educational resources should be subsidized for people with disabilities.

### **5.10 ICT Workshops**

ICT Workshops at rehabilitation centers, schools and other institutions could become an effective educational and training tool for disable. These programs should make attractive to the audience by using different activities such as debates, discussions and prize distributions. A team of trained ICT professional should involve in these activities in different location across the country.

### **5.11 Home based Call centers**

A Home based Call Center can be a play a vital role for the lives of individuals who like to work from home, communicate, share resources and become the inspiration for others. The home based Call centers is a cost effective alternative to offshore and conventional call centers. The costs of call center operations by eliminating the need for infrastructure or agents to be physically located on-site.

## **6. POTENTIAL PARTNER FOR ICT PROJECT FOR DISABILITIES**

Together with government sector, private sector, community could become a major force in the Development of Information and Communication Resources for people with disabilities. Some of the partners could be the following

- **Call Centers**
- **Rehabilitation centers**
- **Banks**
- **Youth Organization**
- **Boy and Girl Scouts**
- **Social welfare Centers**
- **Vocational Schools**
- **Sports Clubs**
- **Industries**
- **Service Sector**
- **Vocational Rehabilitation Agencies**
- **Taxation and Internal Revenue Department**
- **Customers Services**
- **Seasonal and contractual Jobs**
- **Medicare**
- **Insurance companies**

## **7. CONCLUSION**

For past eight year significant efforts have been made by government, private and community in the area of Information and Communication Technology. It is the benefits of ICT that a great number of individuals have mobile phone, though Internet penetration is not very impressive but the numbers of users are growing. Unfortunately very few disabled segment of the society is benefited from Internet connectivity. True Benefit Information and Communication Technology can not materialized until or unless these resources make easy to understand and accessible to all segments of the society. I hope that the above potential recommendations will help shaping accessibility of Information and Communication Technology Opportunities for All.

### **Acknowledgments**

Pakistan Telecommunication Authority initiatives have changed the live of millions of people through different project related to Information and Communication Technologies, still there are too many issues related to ICT and its role in

society, one such issue is the digital divide among people with disabilities. This study attempt to highlight different reason for digital divide particularly for different disability groups and how to bridge this divide. Through this platform I would like to be the part of PTA initiatives and look forward to continue work for the society through Science and Technology.

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