



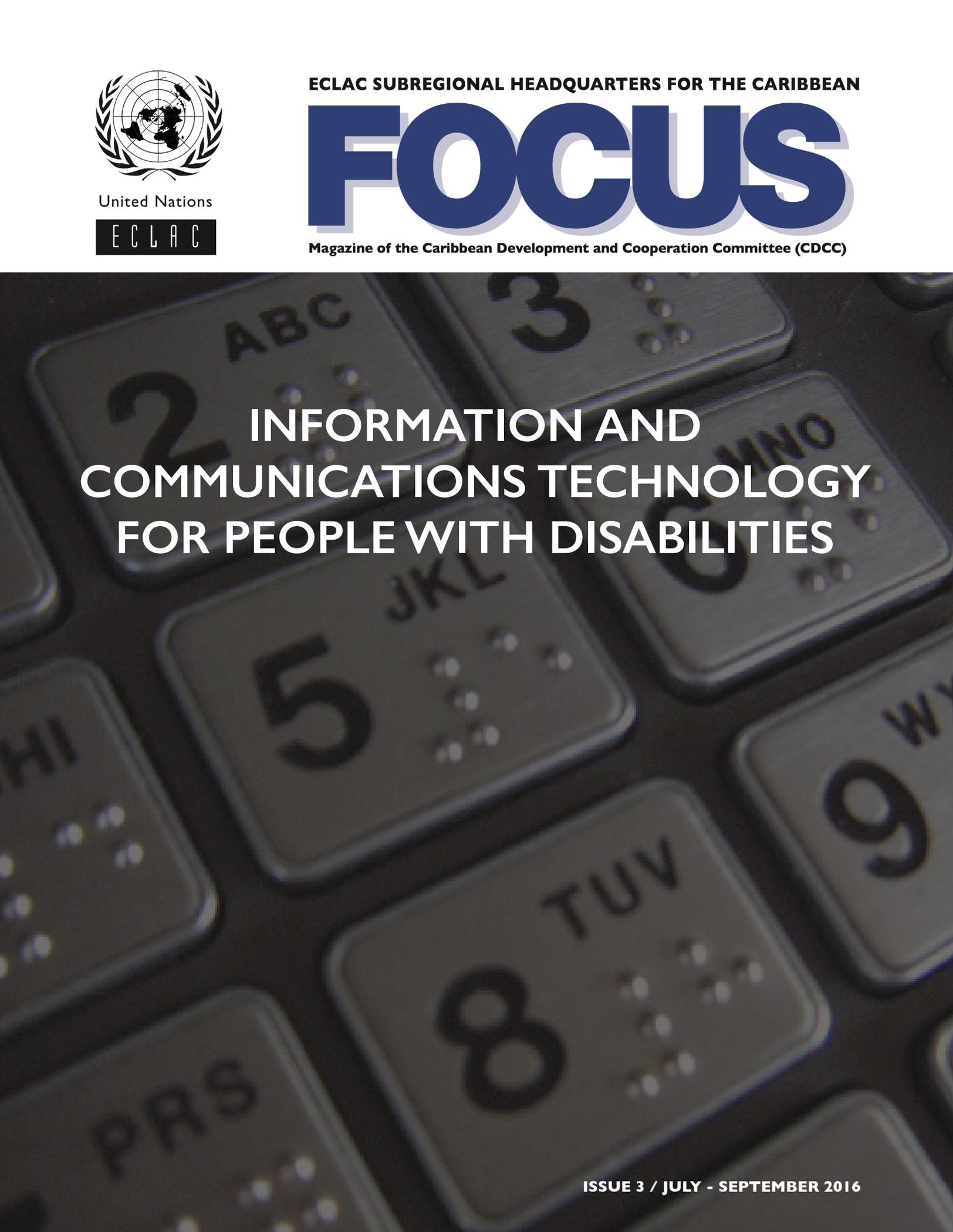
United Nations

ECLAC

ECLAC SUBREGIONAL HEADQUARTERS FOR THE CARIBBEAN

FOCUS

Magazine of the Caribbean Development and Cooperation Committee (CDCC)

A close-up, slightly blurred image of a Braille keyboard, showing various keys with numbers and letters in Braille. The keys are dark with light-colored Braille characters.

INFORMATION AND COMMUNICATIONS TECHNOLOGY FOR PEOPLE WITH DISABILITIES

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ABOUT ECLAC/CDCC

The Economic Commission for Latin America and the Caribbean (ECLAC) is one of five regional commissions of the United Nations Economic and Social Council (ECOSOC). It was established in 1948 to support Latin American governments in the economic and social development of that region. Subsequently, in 1966, the Commission (ECLA, at that time) established the subregional headquarters for the Caribbean in Port of Spain to serve all countries of the insular Caribbean, as well as Belize, Guyana and Suriname, making it the largest United Nations body in the subregion.

At its sixteenth session in 1975, the Commission agreed to create the Caribbean Development and Cooperation Committee (CDCC) as a permanent subsidiary body, which would function within the ECLA structure to promote development cooperation among Caribbean countries. Secretariat services to the CDCC would be provided by the subregional headquarters for the Caribbean. Nine years later, the Commission's widened role was officially acknowledged when the Economic Commission for Latin America (ECLA) modified its title to the Economic Commission for Latin America and the Caribbean (ECLAC).

Key Areas of Activity

The ECLAC subregional headquarters for the Caribbean (ECLAC/CDCC secretariat) functions as a subregional think-tank and facilitates increased contact and cooperation among its membership. Complementing the ECLAC/CDCC work programme framework, are the broader directives issued by the United Nations General Assembly when in session, which constitute the Organisation's mandate. At present, the overarching articulation of this mandate is the United Nations Sustainable Development Goals.

Towards meeting these objectives, the Secretariat conducts research; provides technical advice to governments upon request; organizes intergovernmental and expert group meetings; helps to formulate and articulate a regional perspective within global forums; and introduces global concerns at the regional and subregional levels.

Areas of specialization include trade, statistics, social development, science and technology, and sustainable development, while actual operational activities extend to economic and development planning, demography, economic surveys, assessment of the socio-economic impacts of natural disasters, climate change, data collection and analysis, training, and assistance with the management of national economies.

The ECLAC subregional headquarters for the Caribbean also functions as the Secretariat for coordinating the implementation of the Programme of Action for the Sustainable Development of Small Island Developing States. The scope of ECLAC/CDCC activities is documented in the wide range of publications produced by the subregional headquarters in Port of Spain.

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**DIRECTOR'S DESK:****ICT FOR PEOPLE WITH DISABILITIES**

December 2016 marks the tenth anniversary of the adoption of the Convention on the Rights of Persons with Disabilities by the United Nations General Assembly. Since its adoption, the Convention has been ratified or acceded by 168 countries around the world, including 11 Member States of CARICOM.¹ As Article 1 of the Convention states, its purpose is to “promote, protect and ensure the full and equal enjoyment of all human rights and fundamental freedoms by all persons with disabilities, and to promote respect for their inherent dignity.”

In an increasingly digital age, information and communication technologies (ICTs) offer new ways of meeting this commitment towards those members of our society who have disabilities. While there have been great advances in the development of specialized assistive technology, such as microprocessor-controlled prosthetics or digital hearing aids, more general-purpose technologies, such as ordinary computers, tablets and smartphones, offer significant opportunities for broader social and economic inclusion of persons with disabilities. Real-life examples include:

- ▶ A person is blind that now pays their bills online.
- ▶ A wheelchair user who is able to use the internet to access training at a tertiary learning institution.
- ▶ A person who has lost the use of their limbs, but carries out the day-to-day business of an organization by accessing a computer using voice-recognition software.
- ▶ A blind person who reads printed paper documents by using the camera, audio and text-recognition capabilities of a smart phone.
- ▶ A person who is deaf who uses closed-captioned YouTube videos to learn new skills.

All of these examples show that the ICTs in widespread use today can make a significant difference in the lives of persons with disabilities. Unfortunately, their use of ICTs can be limited by

their lack of access to technology. Barriers to access can include a lack of awareness of available technologies and of what can be achieved through their use, a lack of available training in their adaptive use, and a lack of financial resources to purchase the hardware, software, network connectivity and specialized support equipment that may be necessary. Thus, there is a need for initiatives that build awareness, expand digital literacy, finance the acquisition of devices and software, and provide technical support for the use of ICTs among the disabled.

Both governments and private institutions have a responsibility to ensure that the means through which they digitally interface with the public – such as websites, apps, and electronic kiosks – can be used by those who are visually or mobility impaired. Sadly, this is not universally the case; in the Caribbean, even many government web portals fail to meet this standard. Clearly, ICT specialists are in need of training to ensure that the systems they build and services they provide are compliant with established accessibility guidelines for digital content.

Implementing programmes to meet these challenges costs money. Unfortunately, funds to support access for those with disabilities are often not prioritized in national budgets to the extent that they are needed. However, most Caribbean countries now have Universal Service Funds (USFs) - paid for out of a surtax on telecommunications services - which offer a potential vehicle to fund initiatives for expanding access to technology among persons with disabilities. Indeed,

USF-funded projects in Jamaica and Saint Lucia, among others, have provided important means of reducing barriers to ICT access for the disabled, such as through the distribution of laptops or through financial assistance to ICT-based initiatives spearheaded by disability support organisations. In many cases, however, these funds have been underutilized. There is a need to alert organizations that support persons with disabilities to the potential availability of USF funding for ICT-related projects, and to help them clear any regulatory, compliance, or organisational difficulties associated with making use of these resources.

ECLAC, in cooperation with UNESCO, has been carrying out research for a forthcoming study entitled “Information and Communications Technologies for the Inclusion and Empowerment of Persons with Disabilities in Latin America and the Caribbean”. In this issue of the Focus magazine, we will relate to you some of what we have learned in this process. We hope that the publication of our upcoming paper – and this magazine – can promote a discussion that facilitates the removal of barriers to ICT access, and which supports the role that ICTs can play in enabling persons with disabilities to participate fully and equally in Caribbean society.

Yours in Focus,

A handwritten signature in black ink, appearing to read 'Diane Quarless'.

Diane Quarless

¹ Of the 15 CARICOM member states, Saint Lucia and Suriname have signed, but not ratified the convention, while Saint Kitts and Nevis has neither signed nor ratified the convention. Montserrat, though a full member of CARICOM, is not eligible to sign the convention due to its status as a British Overseas Territory.



ICT: ENABLING INDEPENDENCE AND PRODUCTIVITY FOR PERSONS WITH DISABILITIES

Mr. Leslie A. Emanuel, Executive Director, Disabled Peoples' International North America and the Caribbean, Inc.

With the advancement in technology, persons with physical limitations, like me, are able to independently communicate with people around them and across the world. However, technology is not always affordable, especially for persons with disabilities in the Global South.

For persons with disabilities, communication is carried out in many varied forms. Persons with dyslexia or autism were once thought not to have the ability to learn. That was never true, and it is now realized that such persons learn by other means. Similarly, people who are hard of hearing or deaf or dumb were also perceived to be lacking intelligence. The introduction of hearing aids, sign language, TTY (teletypewriters adopted to send signals over the telephone), smart phones, doorbells with flashing lights, and devices that speak out loud as people enter text all prove otherwise. People with visual impairment and/or blindness were confined to communicating in Braille until the introduction of software such as Window Eyes and Job Access With Speech (JAWS). Now persons with visual impairment and/or blindness have the option of communicating through multiple media thanks to the availability of new ICTs. Unfortunately, however, the costs of these resources are often prohibitive for people in developing and middle-income countries.

Stemming from the above, I believe that my personal experience is illustrative of the opportunities provided by the advent of new ICTs as well as of the challenges still facing people with disabilities in this regard.

Until 1996, I executed all my correspondence by dictating it to my personal care assistant, and anyone else who was willing to help me write. This of course was not very conducive to free-flowing communication, or to privacy. It was therefore a true blessing when a fellow colleague, also with physical limitations, kindly offered me

a used laptop computer in 1996. I had never used a computer prior to my injury in 1990.

I first learned to operate the computer by tapping the keys with a stick in my mouth! I later accessed a “professional” mouth stick employed by occupational therapists. In 1997, I was awarded my first brand-new laptop computer, complete with voice recognition software produced by Kurzweil. Needless to say, it was early days in the development of speech recognition software, and the program was not sufficient to allow me to execute my communication-related responsibilities and personal tasks.

Given the limitations of the voice recognition software, I continued tapping the keys with a mouth stick until 2002 when a generous couple provided me with a more advanced voice recognition software, named Dragon NaturallySpeaking, together with a compatible digital audio recorder. The digital audio recorder allows me to dictate notes at home, in the office and when traveling, that can then be easily transcribed by the speech recognition program and stored on my computer hard drive, a flash drive, or on a compact disk.

With an efficient voice recognition application at my disposal, I proudly discarded my mouth stick and equipped myself with a headset microphone -- an indispensable piece of equipment for me, since I have no use of my hands. Dragon NaturallySpeaking transformed the way I communicate and execute my desires and duties. Now, I complete all my communication tasks, including intimate letters and e-mails, independently and privately, and in a

more proficient and rapid manner.

With the annual (and sometimes even biannual) release of upgraded operating systems and compatible software, I found myself having to continuously upgrade the versions of my Dragon NaturallySpeaking software – at a considerable strain on my finances. All the above notwithstanding, there are some assumptions that need to be clarified. While it is true that the speech recognition software is extraordinarily proficient by any standard in allowing me to independently work in all applications, including all Web browsers and e-mail programs, the efficiency of the software is heavily reliant on the availability of a maximum possible amount of hard drive space, RAM (Random Access Memory) and processing speed. My current notebook includes 115 GB of hard drive space, 4.00 GB of RAM and an Intel(R) Core(TM)2 Duo CPU of 2.40 GHz. If any of these numbers were greater, the speech recognition software would be likely to work even better.

In conclusion, my question is “are persons with disabilities especially in the Global South able to take full advantage of the tremendous advancements made in information technology?” In my humble opinion, the answer to this question is most definitively “no”. Opportunities for persons with disabilities to take full advantage of the ICT resources that currently exist are often curtailed by the cost of the specialized software required.

The technology to facilitate productive communication for us persons with disabilities (PWDs) is available, but access to it relies upon advocacy efforts to ensure that we may all enjoy its full benefits and potential. ■



ICT AND THE CONVENTION ON THE RIGHTS OF PERSONS WITH DISABILITIES¹

Robert Crane Williams

The United Nations Convention on the Rights of Persons with Disabilities is celebrating its tenth anniversary. The Convention is a legally binding treaty which protects and promotes the rights and dignity of persons with disabilities. Most Caribbean states have now signed and ratified (or acceded to) the treaty, and non-independent territories in the subregion are bound to the treaty through their status as dependencies of States that have ratified it.

States Parties to the convention are obligated to implement measures to protect and promote the rights set out in the text of the treaty, and to prepare regular reports on progress made toward achieving its goals. Given that several portions of the Convention pertain specifically to issues of accessibility and use of ICTs to support persons with disabilities, the treaty can be used as a legal mandate for the implementation of programmes focused on expanding access to ICTs for those who are disabled. It can be used, for example, to expand the mandate of Universal Service Funds to provide more direct support to the ICT needs of persons with disabilities.² The following paragraphs provide specific instances of areas of the treaty that address issues related to ICTs.

THE PREAMBLE

The Preamble of the treaty recognizes the importance of access to information and communication in enabling persons with disabilities “to fully enjoy all human rights and fundamental freedoms.”

Article 1 describes persons with disabilities as “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.”

ARTICLE 2

Article 2 defines a number of concepts, including “communication”-

which includes access to multimedia and accessible information and communication technology.

It also defines “reasonable accommodation”, which includes modifications and adjustments that do not constitute a “disproportionate or undue burden.” In this regard, Article 2 states that denial of reasonable accommodation is considered to be “discrimination on the basis of disability.” Thus, these definitions, in conjunction with Article 5 – which concerns equality and non-discrimination - establish a right to reasonable accommodation that includes accessibility to multimedia and ICT.

ARTICLE 9

Article 9 of the treaty may be most relevant to ICT, insofar as it speaks directly to the issue of accessibility.

It states that “States Parties shall take appropriate measures to ensure to persons with disabilities access, on an equal basis with others [...] to information and communications technologies and systems [...] open or provided to the public. These measures, which shall include the identification and elimination of obstacles and barriers to accessibility, shall apply to [...] information, communications and other services, including electronic services and emergency services.” Thus, all public-facing services – such as e-government websites, for example – need to be built in a manner that

provides equal access to information for persons with disabilities.

Article 9 also obliges States Parties to:

- ▶ Promote [...] appropriate forms of assistance and support to persons with disabilities to ensure their access to information;
- ▶ Promote access for persons with disabilities to new information and communications technologies and systems, including the Internet;
- ▶ Promote the design, development, production and distribution of accessible information and communications technologies and systems at an early stage, so that these technologies and systems become accessible at minimum cost.

ARTICLE 21

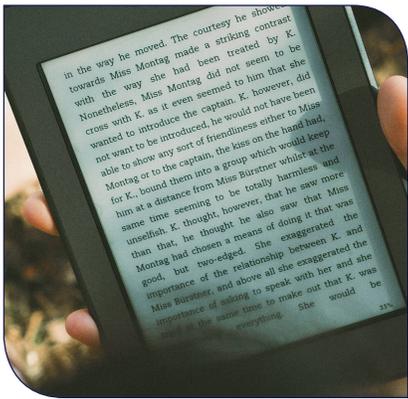
Article 21 of the treaty concerns the rights of persons with disabilities to “freedom of expression and opinion, and access to information,” and entails the “freedom to seek, receive, and impart information and ideas on an equal basis with others and through all forms of communication of their choice.”

It states that governments should “provide information of interest to the general public to persons with disabilities in accessible formats and technologies,” and urge private entities – including providers of internet-based services – to do the same.

▶ (continued on page 7)

¹ This article has been adapted from an upcoming ECLAC research paper entitled Information and Communications Technologies for the Inclusion and Empowerment of Persons with Disabilities in Latin America and the Caribbean.

² Global Initiative for Inclusive Information and Communication Technologies (G3ICT), Center for Internet & Society (2011.) Universal Service for Persons with Disabilities: A Global Survey of Policy Interventions and Good Practices. p. 42.



HELPING THE DEAF TO CONNECT TO AN INCREASINGLY VOCALIZED INTERNET

Robert Crane Williams

The internet has evolved from a medium based primarily on text, to a multi-media environment in which sound plays an important role. This has significant implications for inclusion of the deaf and hearing-impaired. While new automated transcription technologies are emerging that can improve accommodations for the deaf, more work must be done to make their use suitable to the Caribbean context.

Digital technology helps members of the deaf community to engage in unmediated interactions with non hearing-impaired persons. The advent of the internet, most notably, has increased the immediacy of text-based communications, which had previously been bound to slower media, such as print, or pen-and-paper. Instant messaging services and e-mails offer perfect examples in this regard.

Written text on the internet – supplemented with images – and text messages on mobile phones offer unprecedented information access to deaf people, as compared to earlier, sound-reliant communication technologies such as radio, television and the telephone. These technologies are enabling the hearing impaired to become active participants in a global conversation, as opposed to being passive recipients of a broad range of media. The rise of social networking has facilitated social inclusion to the extent that differences in hearing ability need not be a barrier to online relationships between those that are deaf and those that are not.

However, online communications are evolving in a direction that is less text-centric than it used to be. The past decade has seen the rising prominence of video, with Netflix and YouTube being the two largest consumers of internet bandwidth in the Caribbean region. Audio content has also greatly expanded – not just through music, but through podcasts, which in many cases provide invaluable information to specialty audiences. Video and audio-based chat is increasingly popular, and is becoming an important

means of social interaction, for example through social media or on-line video games. There is even a new generation of internet connected-devices – such as the Amazon Echo and Google's Home device – through which interaction is almost entirely speech based.

In keeping with the internet becoming far less text-centric, it is now important to ensure that the hearing-impaired do not become excluded from full participation in online activities. In many cases, technology exists that can enable access for the deaf to audio-based content, but it will take sustained effort and conscientiousness to ensure that it can be effectively used in the Caribbean context. The provision of text-versions of podcasts and the transcription of video files into text, which enable services such as closed captioning of internet videos, offer good examples of inclusive solutions for the hearing-impaired. Transcription services can be carried out either by a human or by software. While transcriptions carried out by humans are of better quality, software-generated transcripts can be delivered in real time, at low cost on a virtually unlimited scale. Sometimes a hybrid approach can be used, in which the software takes a first pass at transcription, later to be cleaned up by a human. Once produced, the text can be placed alongside the multimedia file from which it was generated – perhaps accessible through a link on the media player itself. These are services which can provide value to the hearing as well as the hearing-impaired.

These processes are already taking place, to some extent. For example, YouTube

has the ability to auto-generate closed-captions from the speech in a video, and encourages those who post videos to edit these captions for clarity and to remove any transcription mistakes. However, while the software for speech-to-text process tends to be somewhat effective in transcribing dialog spoken in some British or American accents, the language models used tend to be poorly adapted to other accents, including those from Caribbean countries. Thus, transcription of locally-produced content in Caribbean countries faces additional challenges that can serve as a barrier to access for deaf audiences. This problem may become more acute with the rise of real-time auto-captioning technology, which would otherwise be of great value in supporting the accessibility of video-conferences or on-line voice-based interaction.

Though voice recognition software, such as Dragon NaturallySpeaking, can be trained to recognize voice commands and dictation from a single individual, the development of more general-purpose acoustic models for voice recognition is a significantly more difficult task. But it is also a task that has become easier in recent years, due to advances in machine learning-based artificial intelligence technologies. These technologies enable tools that can be used to automate significant portions of the acoustic model development process, such as through Microsoft's Custom Recognition Intelligent Services (CRIS).

However, even the most advanced artificial intelligence system cannot build an acoustic model for voice recognition without a large volume of data to inform

¹ This article has been adapted from an upcoming ECLAC research paper entitled Information and Communications Technologies for the Inclusion and Empowerment of Persons with Disabilities in Latin America and the Caribbean.

the process, in the form of audio files paired with existing transcriptions that have already been done by humans. While this type of data is available in sufficient quantity to develop models corresponding to accents that are common on a global scale, small Caribbean countries will likely find it difficult to assemble an adequately sized corpus of existing audio and transcripts.

Thus, there is a need for concerted effort to transcribe Caribbean voices for the purpose of providing feedstock to the development of acoustic models. This may be accomplished as part of an ongoing effort to provide closed-captioning for video content. Still, transcriptions of newscasts alone may not be sufficient, as the voices one hears in the media can be quite different from what one hears in shops or in the street. Indeed, to support effective auto-transcribing, there may be a need to construct more than one acoustic model for each Caribbean country, as

accents within countries can vary by geography, ethnicity, and social class.

Taken from a broad perspective, the issue of how to accommodate the hearing-impaired reflects several important truths concerning the use of technology for supporting the inclusion of persons with disabilities. The first is that the landscape is evolving very quickly; ten years ago, YouTube was a brand-new phenomenon and the web was still mostly a quiet place. Further, the machine learning technology of the time would have been very much unequal to the task of comparing sound to audio transcripts and using that to build a model through which conversations could be effectively auto-captioned in real time. A second truth is that the Caribbean countries have characteristics that distinguish them from other parts of the world, and as such have a set of concerns, including limited scale and high linguistic diversity, that can limit the capacity of systems for the accommodation of the

disabled to adapt to a rapidly evolving technological landscape.

A third truth is that, despite the speed of change, and despite the barriers that exist, these obstacles can be overcome. Even as new problems emerge, ICT is bringing new solutions to the table. With the support of the public sector, the business community, technologists, social workers, volunteers, family members, and, of course, by drawing upon their own resources, persons with disabilities can be empowered by ICT to prosper as active and contributing members of society. The exclusion of persons with disabilities is a social problem, more than a technical one, but ICT access for those with disabilities is worthy of special attention because of the contribution it can make to overcoming the discrimination that disabled people face in, for example education and employment, as well as civic, community and family life. ■

► (continued from page 5)

ICT AND THE CONVENTION ON THE RIGHTS OF PERSONS WITH DISABILITIES

REPORTING

The reporting obligations of States Parties are covered in Article 35, which mandates that countries should report on their progress on meeting the obligations of the treaty within two years after its entry into force, and thereafter submit status reports at least once every four years.

Of the 11 CARICOM countries that have ratified the Convention, only Haiti is listed as having submitted such a report by the United Nations Secretariat. The absence of this information is detrimental to the understanding of disability in the Caribbean subregion.

In the past, representatives of small countries have complained

of “reporting fatigue” in relation to the collection of information to be reported to various treaties and international bodies. However, United Nations human rights treaties have a special status, forming as they do the basis of international human rights law. Moreover, Caribbean governments have clearly indicated that priority attention should be given to the concerns of persons with disabilities; commitments which were expressed most recently in the Declaration of Pétion Ville.³ Caribbean governments have also prioritized the closely related issue of non-communicable diseases (NCDs), a major cause of disability, and are implementing policies and actions to control NCDs.

The reporting process should also be seen as an opportunity to engage persons with disabilities and their

representative organisations to support governments in the process of review and compilation of reports. Such organisations should, after all, be involved not only in review but also in policy formulation and decision making more generally; an important principle which is encapsulated by the slogan “nothing about us without us”. Most importantly, the review and reporting process should help countries to build and maintain the momentum necessary to achieve the goals of the Convention, and thereby help to improve the lives of persons with disabilities in the Caribbean.⁴ ■

³ Declaration of Pétion Ville: Building a Disability-Inclusive Society For All, CARICOM High Level Ministerial Meeting on the Rights of Persons With Disabilities in the Caribbean, December 2013.

⁴ More information on the Convention on the Rights of Person with Disabilities can be found on the website of the Committee on the Rights of Persons with Disabilities, at: <http://www.ohchr.org/EN/HRBodies/CRPD/Pages/CRPDIndex.aspx>



FACILITATING ACCESS THROUGH UNIVERSAL SERVICE FUNDS¹

Robert Crane Williams

Universal Service Funds (USFs) exist in many Caribbean countries, and have the potential to be a sustainable source of funding for programmes aimed at improving access to information and communication technologies (ICTs) for persons with disabilities. USFs are mechanisms that have been set up in countries around the world to create a source of revenue that can be drawn upon to finance socially beneficial ICT projects. In general, they are funded through a one or two per cent surtax on telecommunications services.

Traditionally, USFs have been used to expand telephone and broadband networks into geographical areas that private telecommunications companies would otherwise view as unattractive for investment. This is to ensure that people located in areas with low population density or limited wealth are nonetheless connected to telecommunications networks.

In recent years, there has been a move to reshape the mandate of these funds towards ensuring both universal service and universal access. The concept of universal access recognizes that not only do remote, disadvantaged and vulnerable populations require an available connection to the broader telecommunications network, but they also need the skills, equipment and support services to be able to make use of it.

The disabled are in particular need of these types of programmes, not only due to their specific needs in terms of training and support, but because they often find themselves at significant financial disadvantage due to their income-generating capacity being curtailed as a result of their disability. As a result, they may face difficulty in affording the technology that could make such a difference in their lives by providing them with access to the digitally connected world. This is a gap that can be bridged through the use of Universal Service Funds.

Increasingly, the role of USF in facilitating access to the disabled is being recognized as part of the legislative mandate for USFs. For example, Section 39(2.d.iii) of Jamaica's Telecommunications Act states that one of the roles of the fund is to "support information and communications technology programmes that specifically target vulnerable groups, including low income households, the elderly, the youth and disabled persons." Under Trinidad and Tobago's universal service regulations, put forth in 2015, it is considered a "mandatory Universal Service Initiative" for those with telecommunications concessions to make "special provision of approved assistive technology for persons with disabilities to support use of basic telecommunications services."² The USF makes funding available for concessionaires to recoup costs associated with providing this equipment.

The USF programmes in Jamaica and Trinidad and Tobago offer two different examples of how funding can be distributed, and this has significant implications on how they may be marshalled to support increased access to ICT for the persons with disabilities. In Jamaica, USF funding is administered through a corporate body, which supports projects managed by a broad variety of organizations. Organizations that have managed USF projects include NGOs, such as the Jamaica Association for the Deaf, and

educational institutions, such as the University of the West Indies' Centre for Disability Studies.

In Trinidad and Tobago, as in several other countries, the USF is administered directly by the telecommunications regulatory authority. Funding for projects under the USF is limited to the licensed telecommunications carriers that pay into the fund. Thus, disability support organizations wishing to pursue projects focused on reducing barriers to ICT use for the disabled must do so in partnership with one of the telecommunications carriers. This is somewhat limiting to the scope of projects, in as much as they must be congruent with the priorities of the telecommunications companies. However, most carriers in the region do have offices that work in support of corporate social responsibility, and therefore should be amenable to cooperating on projects to promote broader access to ICTs – especially ones that can be financed via USFs.

► (continued on page 11)

¹ This article has been adapted from an upcoming ECLAC research paper entitled Information and Communications Technologies for the Inclusion and Empowerment of Persons with Disabilities in Latin America and the Caribbean.

² This <http://www.news.gov.tt/archive//E-Gazette/Gazette%202015/Legal%20Notice/Legal%20Notice%20No.%2063%20of%202015.pdf>.



PUBLIC PROCUREMENT STANDARDS FOR ACCESSIBLE ICT

Robert Crane Williams

Government-financed ICT projects should be compatible with common accessibility tools used by persons with disabilities. By creating a mandate requiring that accessibility features be considered as part of public procurement processes for ICT products and services, governments can provide better support to their disabled citizens. This also helps to encourage the more widespread implementation of accessibility measures in the private sector. There are a number of policy resources and examples that Caribbean countries can look to in considering how to establish such a mandate.

In the United States, a law known as “Section 508” has been enacted to establish and enforce ICT accessibility standards for Federal agencies. While the law applies to any services procured by Federal agencies in the United States – and with the US Federal Government being the largest purchaser of ICT services in the country –, the need for software vendors to do business with the Federal Government in order to build products that comply with the accessibility requirements set out in Section 508 has contributed to the widespread adoption of industry standards for accessibility.

As a result, Section 508 compliance is a feature of many computer hardware products on the market today, including smartphones, which support a number of accessibility modes used by blind and deaf users. In addition, many software development and web authoring frameworks support Section 508 compliance out of the box – though a certain level of specialist knowledge is still needed to ensure that these tools are appropriately used. Unfortunately, many new and inexperienced software and web developers are not even aware of accessibility issues, and have not been trained on how to use these tools to develop accessible applications. Because of this, many web-based applications fall short of providing a fully inclusive user experience.

With regard to the accessibility of web-based applications in particular, Section 508 draws upon the work of the World Wide Web Consortium (W3C) – the international standards body for the web – which has established the

Web Content Accessibility Guidelines (WCAG). These guidelines are established along four principals – that information and user interface components must be perceivable, operable, understandable, and robust.

Perceivability requires that components of a web page be presented to users in a way that can be recognized, discerned and distinguished, regardless of the way that the content is accessed. For example, visually impaired users may access websites through the use of a screen reader that translates all text on the page into spoken words. This can be a problem if important elements of the page are based on imagery. Thus, web developers are discouraged from using images alone to convey information and, in cases where images are used, there should be descriptive alternate text attached to the image that states the context of the picture. Web browsers are able to handle this “alt text” in a way that is unobtrusive to sighted users, but which enables the users of screen readers to interpret the content of an image. Unfortunately, alt text is frequently not maintained by proprietors of websites – including many government websites in Caribbean countries.

Operability entails the need to ensure that the functions of user interface and navigation components of websites are available to all users. For example, those using screen readers or who have impaired mobility commonly navigate desktop browsers using keyboards to tab between the various links on the page, rather than using a mouse to select a hyperlink. Thus, an important step in the development of any

website is to validate that keyboard-based navigation works to access all functional elements of every page. This is a relatively straightforward task when dealing with simple page layouts, but is often complicated by the inclusion of complex elements, such as slideshows, drop-down menus, and special features implemented using Flash or JavaScript. In general, these elements can be made keyboard-accessible, but that often requires and additional investment of developer time and effort.

These types of standards of accessibility for ICT procurement in the public sector can be an important force for the removal of barriers to persons with disabilities. In addition to the example of Section 508, and of technical guidelines established by organizations such as the W3C, the Global Initiative for Inclusive Information and Communications Technology (G3ICT) has established a toolkit on e-accessibility policy that includes recommendations on the establishment of effective public procurement policies. Governments of the Caribbean should draw on these resources, together with technical support and expertise provided by organizations like G3ICT and ECLAC, to develop policies on accessibility standards for public procurement of ICT appropriate to the needs of their countries. ■

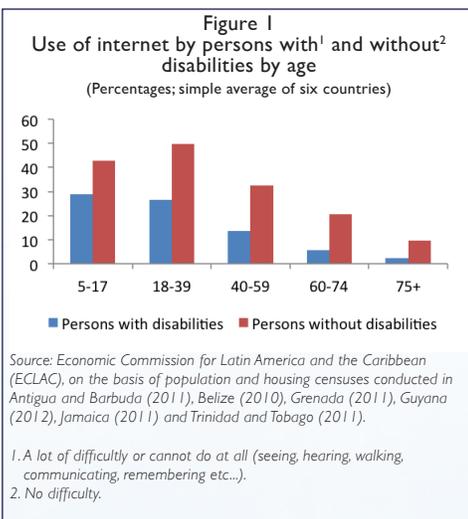


USE OF ICT BY PERSONS WITH DISABILITIES IN THE CARIBBEAN: EVIDENCE FROM CENSUS DATA

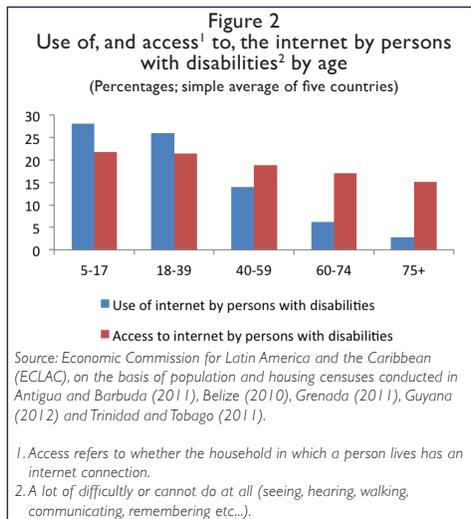
Francis Jones

In most Caribbean countries, the population censuses conducted between 2010 and 2012 collected information about access to, and use of, technology, specifically the internet. This has made it possible to analyse internet use among persons with disabilities and how this compares to that of persons without disabilities.

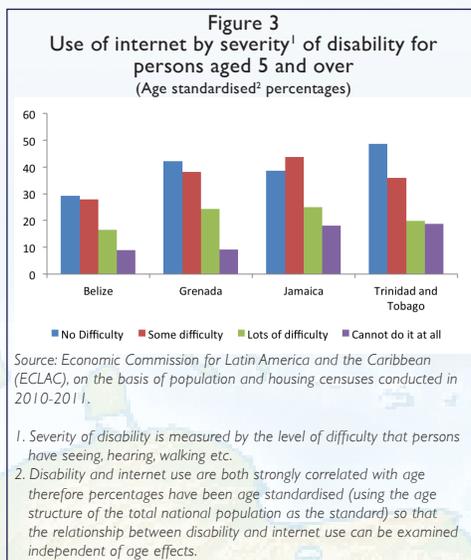
An analysis of data from seven countries indicates that persons with disabilities are much less likely to be internet users compared to the non-disabled population, and that this is the case for every age group (Figure 1). Levels of internet use are lower among older persons generally and are particularly low for older persons with disabilities. At the time of these censuses, only around 5 per cent of older persons with disabilities (aged 60 or over) were internet users.



The cost of a home internet connection and a home computer are major impediments which prevent persons with disabilities from accessing the internet. However, even where older persons with disabilities lived in a home with an internet connection, only around one third of these people actually used the internet. This could have been because the internet connection or computer were not shared, or due to a lack of knowledge or interest (Figure 2).



Use of the internet is strongly correlated with the severity of disability. Those persons with a moderately severe disability have rates of internet usage similar or only slightly lower than the non-disabled population. It is primarily among persons with more severe disabilities that rates of internet use are significantly lower (Figure 3).



Among those with disabilities, people with visual impairments are more likely to use the internet. This is because there are many people whose sight is impaired, having deteriorated with age, but not so severely that they are unable to use a computer. Those with hearing, mobility and upper body impairments are around half as likely to use the internet as persons without impairments. For those with impaired cognition, communication or inability to care for themselves, internet use is only about one quarter that of persons without disabilities.

Some types of disability more obviously impact upon a person's ability to use a computer and therefore the internet. For example, one might expect that a visual or upper body impairment would have more effect upon someone's ability to use a computer than would, for instance, impaired mobility. The need to use adaptive devices and technologies is clearly dependent on the type and severity of disability. However, the fact that persons with disabilities of all types are much less likely to use the internet suggests that, in addition to the direct impact of disability, the wider social and economic disadvantage experienced by those with disabilities is also a major cause of the digital divide.

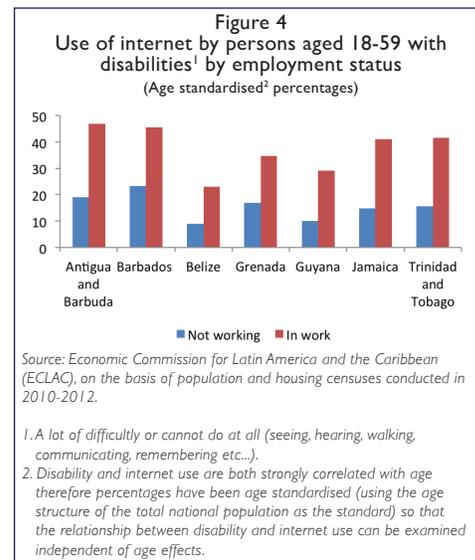
There is a strong correlation between those persons with disabilities that use the internet, and both level of education and employment status (just as there is for persons without disabilities). Those with disabilities that have an employment are typically more than twice as likely to be internet

Table 1
Use of the Internet by type of disability¹ for persons aged 5 and over
(Age standardised² percentages)

	Type of disability							
	Seeing	Hearing	Walking	Remembering and concentrating	Self-care	Upper body	Communicating and speaking	None ³
Antigua and Barbuda	49	24	27	16	12	20	7	55
Barbados	27	28	29	..	10	28	10	45
Belize	24	15	11	7	7	11	6	29
Grenada	31	15	20	11	11	19	7	42
Guyana	28	12	12	9	6	25
Jamaica	36	20	15	7	7	14	6	39
Trinidad and Tobago	27	22	20	13	..	18	10	49

1. A lot of difficulty or cannot do at all (seeing, hearing, walking, communicating, remembering etc...)
 2. Disability and internet use are both strongly correlated with age therefore percentages have been age standardised (using the age structure of the total national population as the standard) so that the relationship between disability and internet use can be examined independent of age effects.
 3. No difficulty.

Source: Economic Commission for Latin America and the Caribbean (ECLAC), on the basis of population and housing censuses conducted in Antigua and Barbuda (2011), Barbados(2010), Belize (2010), Grenada (2011), Guyana (2012), Jamaica (2011) and Trinidad and Tobago (2011).



users (Figure 4). These people are more likely to be able to afford access to the technology. In some cases, their use of technology is also likely to have helped them to find employment, which would suggest that addressing factors which limit the use of ICT by persons with disabilities will also reduce barriers to their gainful employment.

It is reasonable to assume that internet use has increased since 2010-2012, particularly through the use of mobile devices which provide internet access, albeit in a more limited form. Nevertheless, the stark digital divide between those with and without disabilities surely persists. Addressing the physical and technical barriers which

are preventing persons with disabilities from using internet technology (or fully exploiting it) must be a central part of strategies to build disability-inclusive societies. ■

► (continued from page 8)

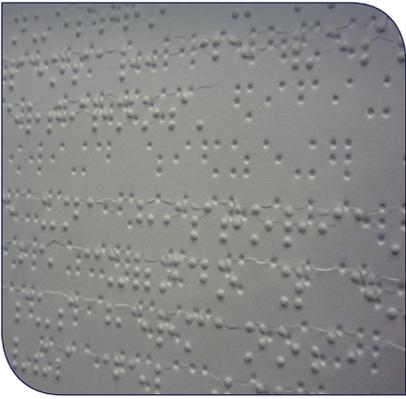
FACILITATING ACCESS THROUGH UNIVERSAL SERVICE FUNDS

In some cases, significant amounts of USF funding have remained unspent, especially in several of the Member States of the Eastern Caribbean Telecommunications Authority (ECTEL). According to CANTO,³ after seven years of operation, the USF in Grenada had disbursed less than one per cent of the funds that it has collected, Saint Lucia had disbursed four per cent, Dominica 15 per cent, Saint Kitts and Nevis 15.5 per cent, and Saint Vincent and the Grenadines had dispersed 76 per cent. It is unfortunate that such a large portion of these

collected funds remain untouched when there is a great need to reduce barriers to access for disabled citizens of these countries. This disparity is one reason ECTEL has proposed a loosening of the restrictions on organizations that are eligible for USF funding.⁴ Should ECTEL's proposal be adopted by its Member States, disability-focused organizations in those countries may become directly eligible for funding, rather than having to work in conjunction with telecommunications service providers.

Universal Service Funds remain a valuable, but often-underutilized resource that can be used to fund programmes that could have a significant impact on the lives of persons with disabilities in the Caribbean. Thus, disability-focused organizations wishing to propose ICT-related programmes that may be eligible for funding should make enquiries with their national telecommunications regulator to understand what opportunities may be available. ■

³ http://www.ntcrod.org/images/consultations/Univ_service_fund_consult/CANTO_Response_ECTEL_Changes_USF_Feb_22_2016.pdf



ICTS FOR PERSONS WITH VISUAL IMPAIRMENTS

Robert Crane Williams

There are a number of ways in which ICTs can assist blind people in their daily lives and help them to be active, involved members of society. These can include both specialized tools, such as Braille readers and printers, as well as general-purpose technology such as smart phones and personal computers.

A major challenge for persons who are newly blind is that there is a lack of knowledge about these tools, and about other resources available to support them in their daily lives. One organization working to resolve this problem is The Blind Way Forward, in Trinidad and Tobago. With initial support from a government grant, the organization distributes MP3 players to the blind that contain an audiobook which explains what resources are available and how tasks may be accomplished using these resources.

For example, smartphones and the apps that run on them hold significant potential for making day-to-day tasks easier for blind people to accomplish. One can use the camera on a smartphone, in combination with printed-out QR codes, for assistance in identifying items around the house. A valuable use case for this is in picking out clothing; if various pants and

shirts are labeled with QR codes, these can be scanned with a smartphone, which will provide an audio indication of the color of clothing items as they are being picked out from the closet.

Another app, called “knfbReader” provides a text-reading capability using a smartphone. It can take a picture of text on a sheet of paper and use optical character recognition (OCR) to convert it to an audio stream to which the user can listen. While previously this functionality had been available through the use of a flatbed scanner, the miniaturization of the smartphone now allows blind people to carry it around in their pocket.

This app costs about US \$100 on the Apple iTunes store, although Google is currently subsidizing 80 per cent of its cost on Android devices. A limitation of this product is that the accuracy of its interpretations of text is dependent on having a high resolution camera on

the phone. Thus, while an expensive iPhone with a nice camera can do a good job at OCR, a low cost Android smartphone with a low-quality camera can make a lot of mistakes, resulting in poor-quality audio.

The cost of technology can be a significant barrier to its adoption. Specialized equipment can be particularly expensive - far more so than for general-purpose electronics. For example, a refreshable Braille display that stores books - similar to a Kindle - was at one point priced at US \$6000 to \$7000. However, prices have dropped, and it is now possible to buy something similar that plugs into a computer (at somewhat lesser quality and with limited features) for under US \$500. Even at this lower price point, however, there is a need for subsidies to provide this type of technology to those who face financial difficulty as a result of their disability. ■

RECENT AND UPCOMING MEETINGS

2017

JANUARY

15 - 18 January 2017

United Nations World Data Forum (WDF) will be hosted by Statistics South Africa - Cape Town, *South Africa*

17 - 20 January 2017

World Economic Forum Annual Meeting will be held in Davos-Klosters - *Switzerland*

30 - 31 January 2017

The Sixth ECOSOC Youth Forum will be held in New York City - *United States*

List of Recent ECLAC Documents and Publications

Listed by Symbol Number, Date and Title

No. LC/CAR/L.493 **February 2016**

Evaluation report of the training course on disaster assessment methodology - Peru

No. LC/CAR/L.500 **May 2016**

Evaluation report of the Training workshop on energy efficiency and renewable energy policy in the Caribbean

No. LC/CAR/W.11 **May 2016**

Barriers to identification and implementation of energy efficiency mechanisms and enhancing renewable energy technologies in the Caribbean

No. LC/CAR/W.12 **May 2016**

Energy efficiency policies in the Caribbean: a manual to guide the discussion

September 2016

Summary of Project Achievements - Sustainable energy in the Caribbean: reducing the carbon footprint in the Caribbean through the promotion of energy efficiency and the use of renewable energy technologies





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