

Technological advances benefiting visually impaired people (*)

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(*) English version by Margaret Clark

At first glance, the title to this session would appear to be too broad for the purposes of this information meeting. Indeed, a general discussion of all the technological advances that contribute to improving the life of blind or visually impaired people would cover everything from talking bathroom scales or watches to Braille displays. So I'll be limiting my remarks to the technological advances that enable blind and visually impaired people to access digitised information.

Nor do I intend to bore you with an exhaustive list of all the hardware and software that make this possible, but rather to clearly and briefly explain how technology can affect this community. What I mean by "digital content" in this context is both the products in that format designed specifically for visually impaired people and those available to the public at large, such as the information found on the Internet.

I would also draw a distinction between "standard technology" and "adaptive technology". Standard technology *per se* has rarely been of much direct use to people with impaired vision; on the contrary, more often than not it has proved to be a cause of frustration. Like nearly everything else, technological advances are designed for the vast majority, for people with no physical or mental limitations, which means that anyone outside that large group is excluded from the direct benefits to be gleaned from their application. There are, of course, very meritorious exceptions, companies or organisations that have developed technologies specifically intended for use by blind or visually impaired people. In most cases, however, what has to be done is "adapt" existing, initially inaccessible technology to enable people who have vision-related problems to use it.

One clear example of this distinction can be found in something as ordinary, today, as personal computers. Once established as a standard tool in all kinds of companies and homes, computers became a major obstacle for blind and visually impaired people. User-computer interfacing was based entirely on a series of messages displayed on the monitor. Anyone unable to read what popped up on the screen was automatically excluded from computer use and, therefore, from the occupational, training and cultural opportunities afforded. This, generally speaking, is the effect that "technology" has on our users. In order to enable people with impaired vision to access the vast amounts of information available through computers, hardware and software solutions had to be developed to enable them to interact with monitors in some other manner. The Braille display that I mentioned earlier, an example of personal computer hardware "adaptive technology", consists of a device that translates the text appearing on the screen, line by line, into Braille characters. Screen readers, in turn, are an example of software technology developed to address this problem. These devices "read" the text messages displayed on the screen "aloud". Another example is screen magnification software, which enlarges the size of the text displayed to help people with severe visual impairment but some remaining vision to read it.

Technology progresses and, nearly always, each new development involves further restrictions on accessibility. This is what happened, for instance, when monitors displaying simple characters on a screen with 80 columns and 24 rows gave way to graphic environments, with windows that open and close, graphic letters unrelated to cells or lines, animated drawings, and so on. New technological adaptation systems, such as the screen readers mentioned above, had to be developed to access this new environment.

Adaptive technology is logically always one step behind standard technology, with the concomitant delays that have a direct impact on users. There are precedents of standard market products with built-in modifications to enhance accessibility, but such elements are always more nominal than effective.

The fact of the matter is, however, that we've managed to adapt standard technology to make it accessible to blind or visually impaired persons: today we have talking computers. What we need to do now is adapt content.

Before we entered the digital era, information generally circulated in the form of printed documents. Printed information, *per se*, is of no use whatsoever to blind people. To access such information, they need to transform it to a format they can understand, such as Braille or sound recordings. Nowadays

digital technology is used for both. But transforming any document to an accessible medium always involves:

- Delays with respect to when the same document becomes available to sighted people.
- Very high costs that can't be assumed by the users themselves but must be defrayed by organisations and associations providing such services.
- Limitations with respect to the number of documents available in these media.

All blind and visually impaired people want to be able to access information at the same time and cost and with the same range of choice as their fellow citizens.

Works in Braille (a reading-writing system using relief characters for blind people, based on the sense of touch) are not sold in bookshops, nor are they commercially published. This gap is filled by hundreds of production centres the world over, associated with organisations and other entities of and for blind people. In other words, since – unlike their sighted counterparts - they can't simply go to their local bookshop to buy the latest best-seller or textbook they need in Braille format, blind and visually impaired people depend on their own resources to produce them from some other format that is wholly useless to them. The production of Braille books is a service provided to blind and visually impaired people. And it is a very costly service: a single volume in Braille is estimated to cost around 100 euros. And it takes from 3 to 4 volumes in Braille to reproduce a conventionally printed book of average length, translating into production costs of up to 400 euros for a novel that costs no more than 10 in bookshops.

Talking books can be found in bookshops in some countries. In Canada, the United States or the United Kingdom, sound recordings are a relatively popular way to read. But in Spain, where I live, this format is not commercially marketed at all. And many such recordings contain not the entire work, but abridged versions, mutilated by publishers to reduce the number of cassettes or CDs involved. Moreover, usually only fiction is available in this format.

The result of the above is that, taken together, all of the publications available in alternative formats usable by blind or visually impaired people account for less than 5% of all the books published, printed and available in bookshops. This means that even with the enormous economic effort deployed, all we're able to provide our users is a small sampling of what is readily available to consumers with no visual impairment in their local bookshops, where they can browse, reject or select and purchase.

And yet, paradoxically, nowadays any hard copy publication is produced from an underlying digital file, which has to be re-generated by the organisations publishing the very same work in a format accessible to visually impaired people. Wouldn't it be easier for these organisations to have controlled access to such electronic documents, to save production time and costs? Such an initiative is now underway in the United States, primarily for textbooks. Publishers must place an electronic copy of such books in a controlled deposit accessible only to authorised organisations or entities, not only to shorten production times and lower costs, but to make all, rather than a mere 5%, of the educational books published in the country available to students. I might add that the file format that will more than likely be chosen as the only one acceptable for this national deposit is DAISY.

Sound recordings are unquestionably the most accessible format for people with impaired vision, because they, unlike Braille, call for no prior learning process. This is the ideal medium for people who lose their sight late in life, a community which nearly invariably accounts for the largest share of our users the world over. These recordings (or "talking books" as we call them) are true reproductions of the printed originals, normally read by a narrator and recorded and distributed, up until recently, in analogue format.

I say up until recently, because since the DAISY Consortium (the entity that I am honoured to represent here today) was founded in 1996, these recordings are beginning to be produced and distributed in digital format in a number of countries in different corners of the world. The first thing that you're probably wondering as I say this is: "audio CDs first began to be marketed in the 80s - so

why did it take until nearly 2000 to create digital talking books?” And the next question that may come to mind is: “bookshops already carry books on CDs, so why record another version”? And the answer to both questions is the same: because a book read and recorded on one or several CDs is not a “talking book”, or it is not the sort of “talking book” that we need, particularly for books whose comprehension represents more of a challenge than pure fiction, for instance.

Simple CD recordings even of novels - if read more for reasons of study than mere pleasure - may not suffice. Because, if we remove the CD from the player to listen to something else, how can we go back to the same place when we want to resume our reading? How can we quickly find page 245 of a book that’s unpagged? And in the case of a math or literature text book or a legal text, how can we go to article 12, paragraph 7? Or point 3.1.4.1 in chapter 9 of part two? or note 11 to that chapter? Only, I fear, with a good deal of patience.

That’s why the DAISY Consortium was created. And that’s why the DAISY format was created: this international standard for recording books has made talking books as pleasant and easy to use as printed books for those of us who are sighted. Drawing from other established standards (HTML, XML, MP3 and SMIL files), the DAISY format makes it as easy to “leaf” through a talking book as a printed one. It makes it possible to directly access a page number, section, chapter or paragraph, while the players for this type of books enable users to place bookmarks in the CDs they’re listening to. It is, then, the structure, the indexing of all the constituent elements, the total “navigability”, that distinguish DAISY talking books from the CD recordings we’re familiar with.

DAISY began as a format intended exclusively for talking books, but thanks to the use of the standards mentioned above, different types of DAISY digital books have been developed, ranging from those with no more than the sound recording of the book to those consisting exclusively of the electronic text. The latter provides a single file from which all other types of files can be generated, including the Braille version. There are four “hybrid” types between these two extremes, with different combinations of recorded and written text, but they’re all configured to the same navigable structure.

DAISY digital books can be read using stand-alone players specifically designed for this format or personal computers equipped with the appropriate software.

This technology is not only useful for people with impaired vision: indeed, its flexibility and easy usability may enable people with other disabilities, such as dyslexia, to read. But the possibilities don’t end there: wouldn’t you like to have all these features on the CD player in your car, for instance? This is the chief difference between standard technology and technology designed for people with some sort of disability: the former excludes whilst the latter includes. The former is useful for the vast majority of citizens, the latter for all citizens.

Before concluding, I’d like to discuss what I find to be a very illustrative example of how accessible does not necessarily have to mean different. I refer to audiodescription for movies and, in particular, the films distributed today in digital or DVD format. A number of organisations around the world, among them the one I work for, the ONCE, “audiodescribe” films to include information that can otherwise only be perceived visually. Visual impairment has never been an obstacle for people to enjoy a good movie, but films always include information not necessarily reflected in the dialogue but nonetheless important to understanding the plot. The audiodescription process consists of adding a second soundtrack “over” the original which describes, in the gaps with no dialogue, relevant data such as the period in which the film is set, the way the characters are dressed or important details to fully understand what’s happening on the screen during those gaps: a tear shed by the leading lady, a wink or grimace by the leading man, whether the characters are dressed or naked and so on.

There’s no technical complexity involved in including such an alternative “sound track” in a commercial DVD (in much the same way that they different language options are included), and in fact, producers are already doing so in the United Kingdom; yet it enables blind users to purchase films in mainstream stores or hire them from video rental services, something they haven’t been able to do hitherto.

In a similar vein, there's nothing we'd like better than to be able to go to our local bookshop and buy the electronic version (in DAISY or any other accessible format) of the latest book by our favourite author on the day it's released and at the same price as the printed version. Or the newspaper. There's nothing we'd like better than for our job to be unnecessary, for there to be no need for information centres for the blind because society understands their needs and takes it upon itself to enable them to access the same information as all other citizens. But until that happens, we need help and understanding from all areas and sectors to do our job.

When we take a printed document and transform it into a format that makes it accessible to blind or visually impaired people, we're not making "pirate" copies of the book, we're not reproducing it indiscriminately, nor selling it to people who would normally buy the edition that can be purchased in ordinary points of sale; nor do our organisations intend to make a profit at the expense of the holders of legitimate rights over these works. Blind people do not refrain from buying conventional books because they exist in other formats produced outside commercial circuits, but rather because such books are utterly useless to them, whether or not there is some other way to read them. The production of accessible editions enables them to exercise a right to which they are entitled as citizens, to enjoy books they wouldn't be able to buy, that wouldn't exist for them, without the efforts deployed and expense incurred by organisations and associations for the blind around the world.

Given their flexibility with respect to their analogue predecessors, DAISY format books claim to be "a better way to read". But for our users, information in accessible format is "the only way to read".