Written Testimony
of
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Benetech

On

The ADA and Entertainment Technologies: Improving Accessibility from the Movie Screen to Your Mobile Device
To
Senate Committee on Health, Education, Labor, and Pensions
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Chairman Harkin, Ranking Member Alexander, and members of the Health, Education, Labor, and Pensions Committee: My name is Betsy Beaumon, and I lead a team in Silicon Valley that applies technology to underserved communities. Specifically, my program stands at the crossroads of literacy, access for people with disabilities, software, and digital publishing, currently serving over a quarter of a million people, primarily U.S. students, through our Bookshare service. As social entrepreneurs, we look for gaps in services to the people who need them most, to where the mainstream market is failing. Through our projects, including Bookshare, the world's largest accessible digital library, Route 66 Literacy, a literacy teaching tool, and the DIAGRAM Center, an R&D center focusing on the accessibility of images, we have been reminded of the value of bringing a fresh, innovative perspective to bear on difficult challenges. At the same time, it has been through diving in deeper, expanding our offerings in response to the needs of our users, and pulling in other experts, that we have found a path to scaling the benefits. We have learned that addressing every link in the chain is of critical importance.

We've directly experienced the value of legislation that opens up the field to new ideas. But how can legislation complement rapidly changing technology? It's been clear that legislation must support the unmet need (e.g., that accessible books be available to people with print disabilities) and also pave the way for a range of groups to innovate around providing what's needed (e.g., allowing small, non-commercial players the ability to provide content in the proper formats when the market is not, such as image descriptions). It's also critical to avoid trying to legislate specific technologies or formats, which will change faster than the law can keep up.

Finally, our program is a great example of the valuable role of the government from a funding perspective. Our funding from the Office of Special Education Programs has allowed a great idea to go from a small offering to a major service, benefitting a quarter million students across the country. Yet, because the competitive funds allowed us to propose the best approach, they encouraged a level of innovation that is benefitting many more users, including qualified adults.

It is my intention to address the impact of disruptive change, brought about by technology, on accessibility in entertainment. In this realm, technology is allowing us to both realize the true potential of legislation, and, increasingly, to partner with industry to the benefit of many users, even beyond

those with disabilities who are the intended beneficiaries of the work. In order to take a longer view of entertainment and cultural media, I'll focus primarily on a medium with a longer history, an extremely active present, and a hopeful future, where there may be some instructive parallels: reading.

History of Accessible Books for Entertainment in the U.S.

Well before the invention of braille in 1824 by the 15-year old Louis Braille, people were trying to work out technologies (such as wooden blocks) that might enable people who were blind and visually impaired to read. After all, reading was and is the primary gateway to education, civic engagement, and entertainment. By 1931, the program that became the National Library Service for the Blind and Physically Handicapped (NLS/BPH) was established, to carry out the Pratt-Smoot Act, to provide books for blind adults[1]. It didn't take long before technology enabled a leap into a new medium. By 1933, in addition to a uniform braille code for English, the American Foundation for the Blind (AFB) had led the field into the beginnings of reproducible talking books, in the form of 33 rpm records, following on the success of the commercial recording industry. Some of the initial recordings first included in the NLS collection, for the entertainment and civic involvement of adults, included multiple Shakespeare plays and core U.S. historical documents such as the Declaration of Independence and Lincoln's Gettysburg Address. By this time everything was talking, including all movies, which was one giant leap for the industry and one sizable step backward for people who were deaf and hard of hearing, who had lost the inherent captioning of silent films.

Recorded human audio continued to evolve with new content and new listening devices, as well as new groups producing materials. For the next 40 years or so, there were developments in technology and process that chipped away at the cost to produce recordings, including volunteer recording models and the eventual use of digital recording and playback technology. However, executing these services remained very expensive and slow relative to commercial publishing models, leaving citizens with print disabilities at a severe disadvantage in educational settings and in life, where a best-selling novel might be available one to two years after everyone else had read it.

Disruption: Technology Changes the Game and Lays the Groundwork

As with records in the 30's, the use of digital text itself had started well before it was used for entertainment for people with visual impairments. Computers were becoming ubiquitous in the late 1980's, setting the stage for innovators like George Kerscher and Jim Fruchterman. George Kerscher's Computerized Books for the Blind showed that one could obtain and supply books in digital text and Jim Fruchterman's Arkenstone showed that even printed books could be scanned by blind people independently and read aloud. In 1996, the Chafee Amendment was passed, which is a codified exception in our copyright law that allows authorized nonprofit entities, such as Bookshare, whose primary mission is to serve people with disabilities, to create specialized, accessible versions of copyrighted books without the need to request permission from publishers and then distribute them freely to people with print disabilities. This legislation, which included support for digital text, along with the introduction of the World Wide Web a few years earlier, set the stage to create, distribute, and read

[1] Library of Congress, *NLS: That All May Read*, 2012, http://www.loc.gov/nls/about_history.html

accessible books in a whole new way, as it put power to create accessibility into the hands of people with disabilities and the organizations that serve them.

The Bookshare library was born out of a combination of these technologies and legislation, causing the first major shift in the field for over 50 years. The cost and time involved in delivering an accessible book for pleasure reading soon began to drop with the evolution of an industrial strength platform, as well as ensuring that reading tools and other parts of the delivery chain were included in the model. Commercial applications for text-to-speech (TTS) voices, such as GPS technology giving turn-by-turn directions, improved the listening experience at ever lower costs. Meanwhile, the same text files were used to deliver digital braille on demand, creating a level of availability for braille that was simply unheard of.

The Bookshare platform soon became a go-to source of entertainment for thousands of adults with print disabilities, who, for the first time, were able to engage in activities such as browsing through lots of books to decide which to read. In 2007, the Bookshare for Education award marked another major turning point. The significant economies of scale meant dramatically improved quality, timeliness, and ease of access for U.S. students. The project delivered double what it promised; serving over 200,000 students, while delivering over 3,000,000 book downloads. Among those downloads are many books that were downloaded for supplementary reading, and reading for fun, because when reading is no longer an impossible chore, it's entertaining. This tendency toward excessive reading seems particularly pronounced in users of mobile tools – from braille displays to iPhones, which weren't even invented when this award began.

Bookshare has made a significant impact on the lives of our members and their families. Parents are relieved of a large part of the burden that used to fall upon them to make sure that their child has the books that they need for their education. Our tools allow students with print disabilities to learn alongside their non-disabled peers, as they are able to receive their textbooks in a version that they can access at the beginning of the school term. Additionally, they are able to read using mainstream technology, such as smart phones and tablets, rather than using traditional, clunky assistive technology devices that set them apart as different. One of our student members told us: "*This access to books has given me a wonderful opportunity: to flourish despite my disability. I can enlighten my mind, enliven my spirit, and, in a way, experience what I never could. In this world, in which I am at an inherent disadvantage, I may participate, and, one day perhaps, contribute to its betterment."*

Industry Partnerships: Make it Easier to Do the Right Thing

As an organization scanning copyrighted content and providing it to a growing group of users, the relationship with the dominant commercial players in the space, publishers, has had its difficult moments. However, there are two factors that have significantly turned this around: we reach out regularly to form partnerships built on trust and understanding, and we leverage the latest technology to make it easy to work with us. This has led to a stunning fact: today, over 80% of the 3000 books added each month to the Bookshare library come directly from publishers, for free and typically with international rights.

Our hope is that our full collection of nearly 200,000 Bookshare books will soon be available once the Treaty for the Blind sponsored by the World Intellectual Property Organization is passed and ratified. Assuming that the provisions in this treaty are comparable to those of our Chafee Amendment, this will be a significant step forward for people with print disabilities in the rest of the world as they will gain the same rights to receive books in accessible formats that exist in the United States. Passage of the treaty would also more easily facilitate the international transfer of accessible books to this population, thus increasing our capacity to serve them.

In most other countries, through rights from our partners and a small but growing amount of open content, Bookshare users have access to over 90,000 digital titles (vs. almost 200,000 in the US). Just four years ago, this international number was under 10,000. Bookshare's collection is leap-frogging the online collection of primary libraries for people with print disabilities in other highly developed countries, who remain centered heavily on older formats such as human audio recordings, and often do printed braille distribution and other services: RNZFB in New Zealand: around 11,000 books[2]; RNIB in the UK: more than 25,000 books and images[3]; Vision Australia: over 25,000[4].

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What are the key aspects of making it easier for publishers? The first is format: digital text is increasingly the distributed format (vs. PDF image files), and we accept the most common publishing standards as acceptable input formats. The second is distribution: by working with their distribution chain, we provide an easy path to implement the decision to work with us. It has become as easy as pushing a button at a company such as Ingram for books from a publishing partner to flow to Bookshare at the same time as they go to iTunes or Amazon.

Focus End to End: It Has to be Born Accessible, Delivered Accessibly, and Consumed Accessibly

As we look to the future we want, it is that all content producers are producing accessible content in their normal course of business. The third approach to making it easier and cheaper to include accessibility is to provide tools, guidelines, and services to help, leveraging other commercial tools and players whenever possible. And in these efforts all the players must continue to innovate, continually looking to disrupt our own field.

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[2] Royal New Zealand Foundation of the Blind, *Library,* 2010, http://www.rnzfb.org.nz/members/library
[3] Royal National Institute of Blind People, *RNIB Audio Book Service-Talking Books*, 2013, http://www.rnib.org.uk/livingwithsightloss/reading/services/talkingbooks/Pages/talking_books_daisy.aspx /
[4] Vision Australia, *Talking Books*, 2012, http://www.visionaustralia.org/living-with-low-vision/library/books-and-resources/talking-books

The publishing industry is learning about disruption on a grand scale right now, as the shift to ebooks, mobile devices, and fully digital production changes everything they do. They are following the film and recording industries into a digital future. The opportunities for fully digital new content to be "Born Accessible" are huge, and, as with other media, building it in from the get-go is the best approach. That means authors describing images or producers describing video wherever possible.

However, accessible content that gets lost in an inaccessible distribution channel, or delivered to an inaccessible device (or venue) is not usable by a person with a disability. Therefore, even the best content isn't enough. In the ebook world it means working with distributors and the makers of reading tools to make sure those tools are fully accessible to use, and fully support the accessible content. In education this has been supported by the tools makers' desire to provide their tools where accessibility is a requirement.

Books and Movies: Getting More Alike

At its most basic technical level a digital file is a digital file, whether it's an ebook, a movie, or a combination. The line defining what is a book is blurring, as these combinations increase. In ebooks full accessibility includes accessible images, accessible math, and accessible video, where videos require captioning and description, just as in the video entertainment industry. Both books and videos are distributed either initially or eventually online, often through the same retailers, many of whom have either captive streaming applications or specialized readers/players. Theaters are not currently a channel for books, while audio (only) books are now available on some airplanes.

As in movies, the challenge of accessibility in rich, digital books involves adding new content to describe visual elements, or encoding existing content, such as math, in a new way, similar to encoding dialog in a new way for movies. In both industries in the U.S. there has been some success, with a lot more work to be done. Just as we at Benetech are applying innovative technology in a quest for the easiest, least expensive approaches for publishers and their partners to include these elements, there are projects underway looking at ways to similarly change the game in video description and captioning. The Carl and Ruth Shapiro Family National Center for Accessible Media (NCAM) at WGBH and Smith-Kettlewell are two organizations working at the forefront of these approaches. Under the Department of Education, Office of Special Education Programs (OSEP) funding, our DIAGRAM project is leveraging the experience of both groups in multimedia while looking at new ways to provide image access, and the VDRDC (Video Description Research and Development Center) out of Smith-Kettlewell is keeping DIAGRAM approaches in mind for video description.

It is my hope that some of the best technologies and operating models employed in making digital books and videos accessible can lead directly to answers in one of the fastest growing arenas for both entertainment and education: interactive games and simulations.

An International Perspective

In contrast to a relatively limited application of technological innovation in accessible ebooks outside the U.S., at least one other country has taken a lead in providing accessible television for consumers who require video description (which they refer to as audio description, “AD”), the United Kingdom. In the UK all public broadcasters offer AD services on traditional TV, transmitting 23.1% of programs with this feature in 2012. Including commercial stations, 65 TV channels are required to carry at least 10% of their broadcasting with AD, many exceeding 30%, some more than 40%. (Source: Ofcom).

The Royal National Institute of Blind People (RNIB) has been a major player in this work, with strong government funding to work in conjunction with the other critical parts of the value chain, and strong consumer support from Ofcom, the regulatory agency much like the FCC in the U.S. This includes the set top boxes, movie theaters, and talking TVs. As with ebooks, all of those links in the chain must be accessible and in sync for a successful, scalable offering.

In closing, we have significant opportunities to do things right across the media landscape for people with disabilities. Twenty-five years ago bold new universal design ideas like curb cuts were embedded into the law, to the benefit of all. Today 21st century technology challenges us to keep the spirit of the ADA in FRONT of technology development and its impact on life and learning in America. While all Americans can benefit from access technologies such as descriptive text, Americans with disabilities require it, and must not get left behind when available technology can be applied to solve it in the most innovative country on earth.