

Before the  
FEDERAL COMMUNICATIONS COMMISSION  
Washington, DC 20554

In the Matter of	)	
Implementation of Sections 716 and 717 of the	)	
Communications Act of 1934, as Enacted by the	)	CG Docket No. 10-213
Twenty-First Century Communications and Video	)	
Accessibility Act of 2010	)	
	)	
Amendments to the Commission's Rules	)	
Implementing Sections 255 and 251(a)(2) of the	)	WT Docket No. 96-198
Communications Act of 1934, as Enacted by the	)	
Telecommunications Act of 1996	)	

**REPLY-COMMENTS OF THE COLEMAN INSTITUTE FOR COGNITIVE  
DISABILITIES AND THE SAMUELSON-GLUSHKO TECHNOLOGY LAW AND  
POLICY CLINIC AT THE UNIVERSITY OF COLORADO**

Angela Tse  
Student Attorney

Clayton Lewis  
Scientist in Residence, Coleman  
Institute for Cognitive Disabilities

Brad Bernthal  
Supervising Faculty

**University of Colorado School of  
Law – Technology Law and Policy  
Clinic**  
2450 Kittredge Loop Road  
Boulder, Colorado 80309  
303-492-0610

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## EXECUTIVE SUMMARY

Functional, day-to-day use of advanced communications services by people with disabilities is necessary for such technology to have meaningful impact on their lives. The Twenty-First Century Communications and Video Accessibility Act (“the Act”) is a landmark step forward which ensures access of advanced communications services to all Americans, including the 54 million Americans with disabilities.<sup>1</sup> To ensure that the Act is effective, however, user-testing requirements for accessibility must be a feature of FCC regulations.

User-testing requirements for accessibility bridge the growing gap in technology adoption and use by individuals with disabilities. The FCC has estimated that only 42% of Americans with disabilities have broadband access at home compared to the national average of 65% of all Americans who have broadband access. Of all non-adopters in the United States, 39% have a disability.<sup>2</sup>

The evolution of technology generally is seen as an enabling tool, allowing more Americans to communicate and participate in the democratic process. However, as more traditional tools give way to technological innovation—punch-card ballots disappearing in favor of electronic voting booths, push-button telephones fading in favor of touch-screens technology like the iPhone—new, inaccessible technologies often disenfranchise Americans with disabilities. With the passage of the Twenty-First Century Communications and Video Accessibility Act, Congress recognized that unequal access to advanced communications services by disabled Americans is a significant barrier to civic participation and everyday life. This is a decisive moment in securing the rights of Americans with disabilities. Congress mandated that the FCC regulate and administer solutions. User-testing for disabilities with advanced communication services is necessary for a usable, effective solution.

This comment explains why user-testing requirements are essential for bridging the growing technology gap for people with disabilities, particularly those with cognitive disabilities. This comment explains how accessibility user-testing requirements are necessary because accessibility design checklists have been proven to be insufficient. User-testing is commercially feasible and has the potential to greatly improve the lives of Americans with disabilities. Accordingly, the Commission should enforce accessibility user-testing requirements with a complaint-based process whereby sufficient evidence of good faith user-testing will benefit industry organizations with a burden-shifting regime and reduced or waived fines.

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<sup>1</sup> Matthew W. Brault, Current Population Reports 3, *Americans with Disabilities: 2005*, (Dec. 2008) (“2005 Census Report”), available at <http://www.census.gov/prod/2008pubs/p70-117.pdf> (last visited May 1, 2011).

<sup>2</sup> John B. Horrigan, *Broadband Adoption and Use in America* (Federal Communications Commission) (2010) (“Horrigan Adoption Paper”); Elizabeth Lyle, *A Giant Leap and a Big Deal: Delivering on the Promise of Equal Access to Broadband for People with Disabilities*, OBI Working Paper Series No. 2 (Federal Communications Commission)(2010).

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Accessibility to advanced communications services is essential for the 54 million Americans who have disabilities to participate as informed, active, and productive citizens.<sup>3</sup> User-testing requirements are vital to ensure usable and viable technology access to those with disabilities. User-testing requirements can also benefit those without disabilities, particularly elderly Americans who comprise 13% of the total population and who are expected to increase to 88.5 million Americans (approximately 20% of the U.S. population) in 2050.<sup>4</sup> User-testing requirements also increase employment for Americans with disabilities. Today only 40% of working-age individuals with disabilities are employed.<sup>5</sup> Among people with disabilities, studies show that 12-20% of currently deployed U.S. military forces suffer from traumatic brain injury

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<sup>3</sup> Approximately 19% of the U.S. population (54 million) Americans have disabilities. U.S. Census Bureau, U.S. Census Bureau News: 20<sup>th</sup> Anniversary of Americans with Disabilities Act: July 26, May 26, 2010, <http://www.census.gov/newsroom/releases/pdf/cb10ff-13.pdf>.

<sup>4</sup> Currently, approximately 38% of adults over the age of 65 have a disability. *Id.*; United States Census Bureau, The Next Four Decades—The Older Population in the United States: 2010–2050, May 2010, [www.census.gov/prod/2010pubs/p25-1138.pdf](http://www.census.gov/prod/2010pubs/p25-1138.pdf).

<sup>5</sup> See, e.g., Cornell University, 2008 *Disabilities Status Report—United States, Rehabilitation and Training Center on Disability Demographics and Statistics*, at 32, <http://www.ilr.cornell.edu/edi/disabilitystatistics>.

(TBI), which commonly results in cognitive impairment.<sup>6</sup> This comment addresses how the scope of user-testing should include and benefit Americans with cognitive disabilities, including those American service members who have served in Iraq and Afghanistan. The Coleman Institute for Cognitive Disabilities and the Samuelson-Glushko Technology Law and Policy Clinic at the University of Colorado at Boulder respectfully submit these comments regarding the implementation of the Twenty-First Century Communications and Video Accessibility Act.

In three parts, these comments detail why user-testing requirements are essential for ensuring access to individuals with disabilities, particularly those with cognitive disabilities. First, the importance of user-testing is explained and, moreover, such testing is commercially feasible. Second, the Act's definitions of advanced communications services and achievability militate in favor of user-testing requirements. Third, the Act provides jurisdictional power which helps protect individuals with cognitive disabilities.

## **I. USER-TESTING FOR ACCESSIBILITY IN ADVANCED COMMUNICATIONS BEST SERVES THE PURPOSES OF THE ACT**

In this section, we explain why and how user-testing for accessibility in advanced communications services best serves the purposes of the Act. First, user-testing with disabled people is essential to ensuring accessibility, because design checklists are insufficient to guarantee usability. Second, user-testing for accessibility with disabled people is not only achievable, but can also be beneficial for manufacturers and service providers. Third, we state proposed, revised language for FCC regulations covering the proposed complaint-based system for enforcement of user-testing requirements.

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<sup>6</sup> Geoffrey Ling et al., *Explosive Blast Neurotrauma*, *Journal of Neurotrauma* (June 2009); *See also* American Speech-Language-Hearing Association, *Traumatic Brain Injury (TBI)*, [http://www.asha.org/public/speech/disorders/tbi.htm#cog\\_probs](http://www.asha.org/public/speech/disorders/tbi.htm#cog_probs).

**a. User-Testing Is Essential To Ensure Accessibility Because Performance Checklists Are Insufficient To Guarantee Accessibility**

User-testing for ordinary consumers is standard industry practice; it is generally accepted as necessary for the engineering of usable, commercial user-interfaces.<sup>7</sup> One of the main alternatives to commercial user-testing are design checklists which provide user-interface designers a list of features associated with usability.<sup>8</sup> Design checklists are considered less costly than user-testing, because the evaluation process does not involve hiring users, and requires less staff effort.<sup>9</sup> However, since user-testing allows for “direct input on how real users use the system” it is considered “irreplaceable.”<sup>10</sup>

In the process of user-testing, engineers or user-interface designers ask actual users to attempt to use the product, software, or device. Problems are almost always identified by the users, because usability resists simple, sharp specifications that designers can easily follow. An example of user-testing on a product can be seen in a demonstration of “Mobile User” testing services provided by the City University of London’s Interaction Lab where a user of a simple iPhone game application is video recorded as she vocalizes her first responses to the game.<sup>11</sup> The user cites specific examples where she did not understand the user-interface’s purpose or meaning (for example, what the information at the top of the game’s screen was supposed to signify and how the scoring of the game worked). After several rounds of user-testing with different participants, designers respond to the problems identified in users’ tests by modifying

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<sup>7</sup> Scott Cook, co-founder of Intuit (makers of the Quicken personal finance management software that has been famed for being a start-up that became a market leader against Microsoft in the 1980’s), has stated that there is a “big difference between doing it and having marketing people doing it as part of their... design... a very big difference between doing it and having it be the core of what engineers focus on.” Wikipedia, *Usability testing*, [http://en.wikipedia.org/w/index.php?title=Usability\\_testing&oldid=426023798](http://en.wikipedia.org/w/index.php?title=Usability_testing&oldid=426023798).

<sup>8</sup> Jakob Nielsen, *Summary of Inspection Methods*, [http://www.useit.com/papers/heuristic/inspection\\_summary.html](http://www.useit.com/papers/heuristic/inspection_summary.html).

<sup>9</sup> Wikipedia, *Usability testing*, [http://en.wikipedia.org/w/index.php?title=Usability\\_testing&oldid=426023798](http://en.wikipedia.org/w/index.php?title=Usability_testing&oldid=426023798).

<sup>10</sup> *Id.*

<sup>11</sup> Youtube, City University Interaction Lab – iPhone User Testing – (Babe on a Beam), Aug. 4, 2009, <http://www.youtube.com/watch?v=0SeXtreV-w8>.

the design to eliminate or address these problems. This iterative process, where the design is improved by responding to users' input, makes for a far more usable product than any product built or designed without direct user input or feedback.

The standard industry practice of user-testing can and should be implemented with people who have disabilities. User-testing directly addresses accessibility issues through user feedback that can be incorporated early in the design process.<sup>12</sup> Many industry leaders who are at the forefront of their fields for accessible designs, like AT&T, already include user-testing with people who have disabilities. AT&T uses both accessibility design checklists and accessibility user-testing, but has emphasized that its “user-centered design calls for a deep knowledge and understanding of human factors, or how individuals with different mixes of abilities, needs and limitations interact with their environment.”<sup>13</sup> Accessibility, at its core, is about the successful and functional use of a product or service by Americans with disabilities. Accessibility design checklists alone cannot ensure such functional uses of advanced communications technologies; user-testing with people who have disabilities is essential to ensuring accessibility.

Moreover, design checklists have been shown to be insufficient in ensuring accessibility for the people with disabilities. In a 2004 study commissioned by the Disability Rights Commission of the U.K., a panel of 50 people with a variety of disabilities participated in user-

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<sup>12</sup> AT&T's “initial Pantech BreEZe review led to a first iteration of suggested improvements: its documentation accessibility, for instance, was further improved as well as its form factor for messaging. Also, keys were renamed (the ‘send’ key was relabeled ‘call’).” Global Initiative for Inclusive Information and Communication Technologies (G3ict), *White Paper Series Case Study: Accessibility, Innovation, and Sustainability at AT&T: How a culture of inclusion and the adoption of Universal Design at AT&T drive business processes to serve persons with disabilities*, G3ict Publications & Reports (2011), at 16, (“G3ict AT&T White Paper”), [www.g3ict.com/download/p/fileId\\_830/productId\\_159](http://www.g3ict.com/download/p/fileId_830/productId_159).

<sup>13</sup> AT&T's “Human Factors Group” focuses especially on user interaction and feedback, starting with the user by understanding what users want, who they are, what they know, “user capabilities”, and “user limitations.” Their process then ends with the user under objective user-testing, subjective user evaluations, post-deployment analysis, and iterative design. G3ict AT&T White Paper at 4-5.

testing of 100 websites.<sup>14</sup> Of 585 problems revealed in the tests, 45% were not covered by specific design guidelines, and so would not have been detected without user-testing.<sup>15</sup> This 45% fail rate for advanced communications services would not fulfill Congress's intent of ensuring access to technology for the disabled. Imagine if 45% of the essential functions of a phone were inaccessible to a disabled user. For instance, if the contacts or address book information were not accessible for a blind user, making it so that the blind user would have to memorize every phone number she dialed, this would render the phone almost impossible to use for practical everyday use. Since user-testing is already a well-established industry practice for ordinary usability, it is appropriate to ensure accessibility with a user-testing requirement.<sup>16</sup>

**b. Reasonable Limits On Potential User-Testing Requirements Ensure That User-Testing Benefits the Public Interest, Manufacturers, And Service Providers of Advanced Communications Services.**

There are two major objections to potential user-testing requirements. First, industry representatives may be concerned about uncertainties and ambiguities that could potentially exist in user-testing for accessibility. In response, it is appropriate that the FCC create reasonable limits for potential test participants with disabilities based on the expected or likely users of advanced communications products or services. It is also appropriate that the FCC require at least one test user to represent each broad class of disabilities recognized in the operability requirements of the proposed regulations,<sup>17</sup> recommending that more representative users of a particular disability be added based on further interactions with disability advocacy groups.

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<sup>14</sup> City University London, Section on Research: Human Interactive Design, [www-hcid.soi.city.ac.uk/research/DRC\\_Report.pdf](http://www.hcid.soi.city.ac.uk/research/DRC_Report.pdf).

<sup>15</sup> *Id.*

<sup>16</sup> For example, AT&T collects user feedback and tracks issues through “customer service and twice a year via a systemic review by its lab of all its phones, using several hundred data points including an entire section of questions on accessibility.” G3ict AT&T White Paper at 16.

<sup>17</sup> In The Matter of Implementation of Sections 716 and 717 of the Communications Act of 1934, as Enacted by the Twenty-First Century Communications and Video Accessibility Act of 2010, CG Docket No. 10-213, Appendix B, § 8.6, at 65, *Notice of Proposed Rulemaking* (rel. Mar. 3, 2011) (“NPRM”).

Second, industry representatives may be concerned about the potential costs of user-testing. We address how the benefits of user-testing outweigh the costs, while addressing the achievability standard in Section II(b) of this comment.

The first main objection to potential user-testing requirements for accessibility arises from uncertainty about who should be included as test participants. Disabilities vary greatly in terms of functional effects on design. Cognitive disabilities can include many different types of impairments in memory, problem-solving, reading, and other cognitive functions; motor impairments can differ over a wide range of physical capabilities.

The question of which functional impairments should be represented in user-testing for which and what kind of advanced communication services is an important one. However, this same question occurs in usability testing for ordinary consumers where large variations in prior experiences and knowledge, as well as other individual characteristics, render results variable. For example, users with a lot of prior experience with technology understand that the common keyboard shortcuts for copy-pasting text are ctrl+C and ctrl+V. Other users who have little or no experience with technology might have no idea that copy-pasting text is possible (and so will manually type in text) or only know how to copy-paste using the right-click pull-down menu. Despite this variability, user-testing has been found to be a practical method of attaining acceptable usability, and is in everyday use in the industry.

For ordinary consumers' usability testing, participants are selected based on their membership in the target audience of a product. Typically, a range of individuals are chosen who represent the intended users of a product; the ranges could include prior experience with technology generally, prior experience with a specific technology, age, gender, job position, etc. For example, with a teleconferencing tool, ordinary consumer test participants would include

people who already have carried out the type of work the teleconferencing tool is intended to support (e.g. participating in meetings that the teleconferencing tool might be utilized in).

For accessibility user-testing, an appropriate FCC requirement would similarly reasonably limit the selection criteria of participants to the expected or likely users who conduct the kind of work or activities that the advanced communications products or services are intended to support. In accessibility user-testing for a teleconferencing tool like Skype, for instance, participants would have disabilities including deafness, blindness, manual/motor dexterity, and cognitive disabilities (who may particularly benefit from Skype's screen-sharing feature).

Selection criteria of expected users would be especially important for the inclusion of people with cognitive disabilities in the user-testing process. Critics of the inclusion of cognitive disabilities have suggested that it would be impossible for people with certain types of severe learning and intellectual disabilities to use advanced communications tools at all. However, the selection criteria we propose does not require the inclusion of test participants who are unable to perform the underlying activities the tools are intended to support. The selection criteria would also help avoid the potential harm of a new tool potentially rendering a disabled worker formerly capable of performing a job (participating in meetings in the case of teleconferencing) as unable to perform because of the inaccessibility of the new tool.

The opportunity should also not be missed to develop advanced communication tools that can further bridge the existing technology gap for people with disabilities.<sup>18</sup> The ultimate goal of the Act is to increase advanced communications access, however, adapting the technology to

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<sup>18</sup> For example, the iPhone was completely inaccessible to blind users by virtue of its touch-screen, but with the development of VoiceOver technology on the iPhone, the iPhone can now be used as a smartphone capable of increasing the mobile productivity of blind employees. Apple, iPhone: Vision Accessibility, <http://www.apple.com/accessibility/iphone/vision.html> (last visited May 5, 2011).

people rather than forcing people to adapt to the technology is the only way to accomplish this goal. Therefore, it is plausible and even expected within the Act that advanced communications tools are adapted to further extend the capabilities of people with disabilities. More accessible tools and increased capabilities open up new avenues of activities or work for citizens with disabilities that were previously unable to conduct the underlying work or activities of the previously inaccessible tools. Therefore, it is appropriate for the FCC to require, during and in response to a complaint process<sup>19</sup>, that manufacturers provide test results or other evidence of their efforts to extend the accessibility of their tool beyond just those people with disabilities qualified by virtue of their current work or relevant activities supported by their tool.

Because of industry concern over a potential lack of reasonable limits on user-testing for accessibility, it is appropriate that the FCC require *at least one* test user to address each of the operability requirements in the proposed regulations,<sup>20</sup> for example operability with limited cognitive skills. As discussed in Section I(a), the diversity of users' needs and capabilities means that no campaign of user-testing, whether for accessibility or for ordinary consumers, can guarantee usability for all. However, user-interface designers who do not include at least one test participant with needs that reflect the operability requirements of the regulations has plainly failed to address these requirements seriously. Further, we propose the FCC recommend, but not require, that industry organizations consult with disability advocacy organizations regarding whether or not more representative users should be added to the industry organizations' user-testing processes.

The second main objection advanced communication providers or manufacturers may have against accessibility user-testing requirements is the potential cost. However, as discussed

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<sup>19</sup> As proposed in Section I(c).

<sup>20</sup> NPRM Appendix B, § 8.6, at 65.

in Section I(a), the commercial infrastructure to support user-testing for accessibility is largely already in place. Many manufacturers already operate substantial user-testing facilities. Others hire the services of commercial testing operations.<sup>21</sup> Excellent guidance for the inclusion of people with disabilities in user-testing and other development activities is also available.<sup>22</sup> Under these circumstances, the costs of adding participants with disabilities into already existent user-testing channels are most likely to be nominal, and are not inappropriate given the public's interest in increasing accessibility as expressed in the Act. Industry representatives who plead a lack of internal user-testing channels may be exempt under the Act's small business exemption or exempt under the Act's achievability standard.

Potential costs to industry organizations will be outweighed by the benefits to the public interest as user-testing requirements will not only enhance the participation of disabled individuals as active citizens in the technologically-dependent world, but will also expand employment opportunities for people with disabilities. As stated above, advanced communications services technologies have the potential to increase the working capabilities of people with disabilities. Individuals with disabilities will also be in demand as test participants for accessibility. Such employment demand would likely increase in the private sector and contribute to a decrease in the overall percentages of unemployment. Disability advocacy and self advocacy groups could assist the industry in responding to the need for participants by publicizing user-testing participation opportunities and advising testing organization on effective recruitment, as is recognized in the Access Board draft. The advanced communications services industry is also likely to benefit from increased accessibility of ACS technology since it

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<sup>21</sup> The Usability Professionals Association lists firms and individuals offering these services. Usability Professionals' Association, Consultants' Directory, [http://www.usabilityprofessionals.org/people\\_pages/consultants\\_directory/](http://www.usabilityprofessionals.org/people_pages/consultants_directory/).

<sup>22</sup> See Shawn Henry, *Just Ask: Integrating Accessibility Throughout Design*, Madison, WI: ET\Lawton, 2007, available at <http://www.uiaccess.com/accessucd/>

increases the potential purchasing audience to include a larger percentage of the 54 million American with disabilities.

**c. Proposed Language for FCC Revision of Section 255 Pursuant to the Twenty-First Century Communications and Video Accessibility Act**

The current state of the Section 255 rules and the Access Board Draft guidelines recognize the importance of user-testing as both recommend that user-testing be incorporated into the design process. Both clearly recognize that user-testing is the solution when evaluating accessibility and usability of products. In the Section 255 regulations, we read:

“Product design, development, and evaluation.

(a) Manufacturers and service providers shall evaluate the accessibility, usability, and compatibility of equipment and services covered by this part and shall incorporate such evaluation throughout product design, development, and fabrication, as early and consistently as possible. Manufacturers and service providers shall identify barriers to accessibility and usability as part of such a product design and development process.

(b) In developing such a process, manufacturers and service providers shall consider the following factors, as the manufacturer deems appropriate: (1) Where market research is undertaken, including individuals with disabilities in target populations of such research; (2) Where product design, testing, pilot demonstrations, and product trials are conducted, including individuals with disabilities in such activities; (3) Working cooperatively with appropriate disability-related organizations; and (4) Making reasonable efforts to validate any unproven access solutions through testing with individuals with disabilities or with appropriate disability-related organizations that have established expertise with individuals with disabilities.”<sup>23</sup>

The Access Board Draft guidelines also call for the inclusion of people with disabilities in user-testing: “C107.3.2 Product Design, Testing, Demonstration, Trials. When product design, testing, pilot demonstrations, and product trials are conducted, manufacturers shall include individuals with disabilities in such activities.”<sup>24</sup>

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<sup>23</sup> 47 C.F.R. § 6.7.

<sup>24</sup> See United States Access Board, *Draft Information and Communication Technology (ICT) Standards and Guidelines*, (Mar. 17, 2010) (“Access Board Draft Guidelines”), at C107.3.2.

Unfortunately, while both of these texts currently *recommend* the use of user-testing, neither *requires* user-testing to meet the stipulations of regulation. In the Section 255 rules, testing is included among matters to be considered at the discretion of the manufacturer. Similarly, the Access Board Draft guidelines state only that individuals with disabilities will be included if testing is done, without stating when testing might be required, or if it might ever be required.

To clarify this matter, the FCC should assert that manufacturers, under the achievability standard, must provide the results of tests showing cognitive accessibility, or must provide other evidence, such as clear derivation from another design for which cognitive accessibility has been established. This can be done by amending paragraph (a) of 47 C.F.R. § 6.7 / 7.7as follows:

**(a) Manufacturers and service providers shall evaluate the accessibility, usability, and compatibility of equipment and services covered by this part and shall incorporate such evaluation throughout product design, development, and fabrication, as early and consistently as possible. If the product design is not based on an existing design for which accessibility has been clearly established, this evaluation shall include the results of user testing. Manufacturers and service providers shall identify barriers to accessibility and usability as part of such a product design and development process.**

Additionally, the Access Board Draft guidelines can be revised as follows:

**C107.3.2 Product Design, Testing, Demonstration, Trials. When product design, testing, pilot demonstrations, and product trials are conducted, manufacturers shall include individuals with disabilities in such activities.**

this will ensure that products are tested for accessibility using participants with disabilities.

We suggest the FCC follow a complaint-based system similar to the Section 255 regulations under which individual users may submit complaints to the FCC regarding inaccessible advanced communication services subject to the Act. Once a complaint has been

filed against an individual manufacturer or service provider of ACS, the company may in its defense:

- (i) provide evidence of user-testing for accessibility on the product or service, *or*
- (ii) provide evidence that the design was derived from an earlier, reasonably established accessible design.

Establishment of an earlier design's accessibility could be conducted with proof of prior user-testing or proof of a track record of successful and functional use by consumers with disabilities.<sup>25</sup> Evidence of user-testing would include summaries of testing reports generated by user-testing processes (either within internal development channels of industry organizations or by third-party contractors who perform the testing), as well as evidence of what actions were taken in response to user-identified problems and user feedback.

Sufficient evidence of (i) accessibility user-testing or (ii) sufficiently established accessible design derivations may show:

- (a) the product is as accessible as possible under the achievability standard (thereby ending the FCC complaint process in favor of the company), *or*
- (b) the product is *not* as accessible as possible under the achievability standard, but the company has made substantial or good faith efforts to achieve accessibility.

In the case of (b), FCC evaluation of the overall complaint will have found that the company had accessibility problems that should have been addressed under the achievable standard. However, evidence of substantial or good faith efforts by the company should weigh in favor of the company and allow for potential fines to be reduced or waived.

Substantial or heavy fines would be levied if:

- (i) the company's accessibility user-testing was found to be plainly insufficient (for example, no test users address any of the operability categories identified in the

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<sup>25</sup> This provision has the desirable tendency to encourage consistency in the design of user-interfaces for similar products, while not restricting innovations whose effectiveness can be demonstrated in user tests.

regulations,<sup>26</sup> or user-testing results were not at all incorporated into the design process, or individuals with disabilities only tested a tiny fraction of the product), *or*

- (ii) evidence submitted shows that the design is *not* derived from a design of sufficiently established accessibility.

Additionally, as in Section 255 enforcement, cease and desist orders, and, in extreme cases, retrofitting of an ACS product, could be ordered in cases whose circumstances require such remedies. However, evidence of user-testing would again weigh in favor of the company.

The process should be structured such that the complainant or the FCC investigator would carry the burden of proof if the ACS manufacturer or service provider shows evidence of (i) user-testing for accessibility or (ii) sufficiently established accessible design derivations. ACS manufacturers and service providers that choose *not* to user-test for accessibility or use sufficiently established accessible design derivations, based on an internal assessment that under the standard of achievability they are not required to, would carry the burden of proof for demonstrating in the complaint process that the achievability standard cannot be met, rather than the complainant or the FCC investigator bearing the burden of demonstrating that it can be met.

Some industry participants may argue that user-testing is already being conducted, and therefore the FCC should not require it. Some industry participants are indeed leaders in incorporating universal design concepts and addressing accessibility needs in the development process for their advanced communications services.<sup>27</sup> Such organizations would bear little or no added burden under the proposed regulations. However, the breadth and depth of user-testing for accessibility across the board for the industry is currently insufficient.<sup>28</sup> Organizations that do not currently address accessibility, either by basing designs on existing designs of established accessibility or by user testing for accessibility, need to amend their practices. Such

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<sup>26</sup> NPRM Appendix B, § 8.6, at 65.

<sup>27</sup> AT&T, Universal Design Policy, <http://www.att.com/gen/general?pid=10191>.

<sup>28</sup> NPRM at ¶ 2.

organizations should be given reasonable time to internally assess the range of products in development and adhere appropriately to regulations under the achievable standard.

## **II. ADVANCED COMMUNICATION SERVICES AND THE ACHIEVABILITY STANDARD SHOULD BE DEFINED TO THE FULL EXTENT CONGRESS INTENDED BECAUSE IT SERVES THE PURPOSE OF THE ACT AND THE INDUSTRY IS BETTER POSITIONED TO BEAR COSTS**

Congress has stated that the purpose of the Act is to “ensure that individuals with disabilities are able to *fully* utilize communications services and equipment.”<sup>29</sup> In order for individuals with disabilities to fully utilize communications services, user-testing requirements should apply to a full range of entities to enforce regulations pursuant to the Act, including those entities within the interoperable video conferencing space. This section first addresses the definition of “advanced communication services”. Second, we address the Act’s definition of “interoperable video conferencing” services. Third, we address the Act’s definition of the “achievable” standard.

### **a. Definition of “Advanced Communications Services”**

Several industry groups have suggested that “advanced communications services” should be interpreted narrowly to only include “services that are essential to two-way, interactive communications and are actually being offered to the public as ‘advanced communications services.’”<sup>30</sup> They propose the specific exclusion of devices that may have incidental communication features, such as a gaming device like a Nintendo Xbox that allows for IP-based applications (like VoIP solutions such as Skype). The Skype feature on the Xbox is designed to complement multi-player games, allowing for better communication among remote team members. Industry groups emphasize that such features are not part of the core features that

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<sup>29</sup> H.R. Rep. No. 11-563, at 19 (2010) (emphasis added).

<sup>30</sup> CTIA Comments at 5.

surround the device and such devices are not replacements for more typical communication services (like a cellphone).

Technology, however, is evolving such that very few devices are used solely for its core purpose because communication services have become so essential to enhancing the human experience (work, relationship, recreation, etc.) that the use of devices has converged and overlap (i.e. computers are used to make calls, and send texts while cellphones can be used to play games, edit work documents, and watch movies on-the-go). Many of these devices may be utilized in “education, rehabilitation, [ ] social interaction,” business contexts, and other essential ways.<sup>31</sup> The Xbox, for instance, already offers Netflix movies and TV streaming as well as DVD playing. With the Xbox Kinect, video chatting with MSN messenger is also possible.<sup>32</sup> With technology improving to integrate vital communication services that improve user experiences, defining the FCC’s regulatory powers as limited to only devices whose “core/primary” feature is communication will limit the full utilization of communication services that individuals with disabilities would experience otherwise. Such devices are already commonly user-tested across a broad range of individuals, and extending user-testing for accessibility on communication features is feasible.

A reasonable limitation for the definition of ACS should be the applications that the devices provide. Flexibility in a reasonable limitation should account for the potential evolution of devices. Those devices whose communication features are used in applications such as education, rehabilitation, or social interaction should be user-tested for individuals with disabilities where achievable. This would allow for the channels for these essential

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<sup>31</sup> Vanderheiden Trace RERC Comment at 10.

<sup>32</sup> Harrison Hoffman, *The Windows Blog*, “Stay in touch with video Kinect on Xbox and Windows Live Messenger,” Nov. 4, 2010, <http://windowsteamblog.com/windows/b/windowsexperience/archive/2010/11/04/stay-in-touch-with-video-kinect-on-xbox-and-windows-live-messenger.aspx>

communication features to be open for developers to leverage in potential accessible applications, like the Xbox and video messaging.

Limiting the term “advanced communications services” to only those services offered to the public was not the intent of Congress. Section 716 included specific wording regarding those services offered to the public.<sup>33</sup> However, the absence of that specific wording in the overarching definition of ACS in the Act implies that Congress did not intend such a limited definition except where clearly indicated in Section 716.

#### **b. Definition of “Interoperable Video Conferencing”**

The definition of “interoperable video conferencing services” is one of four services that ACS is defined as: (i) interconnected VoIP, (ii) non-interconnected VoIP, (iii) electronic messaging, and (iv) interoperable video conferencing. In many ways, video conferencing technologies have the greatest potential for positively impacting the lives of individuals with disabilities. It allows for a broad range of disabilities to leverage the technology for easy communication across huge distances, relaxing the constraints imposed by physical impairments, sensory disabilities, cognitive disabilities, and developmental disabilities.

Within the Act, an interoperable video conferencing service is defined as “a service that provides real-time video communications, including audio, to enable users to share information of the user’s choosing.”<sup>34</sup> As noted in the NPRM, the original Congressional bill text does not include the term “interoperable” in earlier versions of the bill; however, the enacted legislation

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<sup>33</sup> Providing that the Act’s accessibility requirements “shall not apply to any customized services... not offered directly to the public.” 47 U.S.C. §716(i).

<sup>34</sup> Twenty-First Century Communications and Video Accessibility Act of 2010, PL 111-260, §101, October 8, 2010, 124 Stat. 2751.

states the same definition as the versions lacking the term, failing to distinguish the two phrases from one another.<sup>35</sup>

Several industry advocates have stated that this implies that Congressional intent was to limit the definition of ACS to a small subset of video conferencing services that are “inter-platform, inter-network, and inter-provider.”<sup>36</sup> This subset of services is miniscule<sup>37</sup>, largely commercial rather than consumer products. Interoperability is a difficult problem technologically with 58% of companies utilizing the technology stating that it is the greatest obstacle they face in use.<sup>38</sup> This difficulty has apparently discouraged many consumer-providers of video conferencing from implementing cross-provider solutions. Thus, the goals of the Act would be severely frustrated if interoperable were limited to such a narrow definition.

In the Oxford dictionary, “interoperable” is defined as “able to exchange and make use of information.”<sup>39</sup> Applying this definition would mean in practical terms that video conferencing services that were available “inter-platform” would be within the scope of the Act. Platform is defined as “any of several things, or [ ] a combination thereof, depending on the situation: (1) the type of operating system..., (2) the type of processor (e.g., x86, PowerPC, SPARC or Alpha) and (3) the type of hardware system (e.g., mainframe, workstation, desktop, handheld or embedded).” For example, services that provided video conferencing from an iPad to a computer (like FaceTime or Skype) would therefore be within the scope of the Act’s coverage.

Requirements for interoperability standards between different video conferencing services would provide benefits not only for individuals with disabilities but also for all

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<sup>35</sup> H.R. Rep. 111-563, at.2.

<sup>36</sup> ITI Council Comment at 3.

<sup>37</sup> Including Cisco, Polycom, Tandberg, and Vidtel. Irwin Lazar, *NetworkWorld*, “Getting to Interoperable Video Conferencing,” Mar. 29, 2010, <http://www.networkworld.com/community/node/59360>

<sup>38</sup> *Id.*

<sup>39</sup> Oxford English Dictionaries, Definition of Interoperable, <http://www.oxforddictionaries.com/definition/interoperable?view=uk>.

individuals who use video conferencing services in that it would reduce transaction costs of communication and potentially increase business transactions.

**c. Definition of “Achievable”**

The achievable standard of the Act must take into account: (1) the “nature and cost of the steps needed to meet the requirements of this section with respect to the specific equipment or service in question,” (2) the “technical and economic impact on the operation of the manufacturer or provider and on the operation of the specific equipment or service in question, including on the development and deployment of new communications technologies,” (3) the “type of operations of the manufacturer or provider,” and (4) the “extent to which the service provider or manufacturer in question offers accessible services or equipment containing varying degrees of functionality and features, and offered at differing price points.”<sup>40</sup>

The “achievable” standard of the Act is higher than the “readily achievable” standard that was enacted in Section 255 previously. “Achievable” is defined within the Act to mean “with reasonable effort or expense.” Disability advocates have stated that the standard should be similar to that of the new construction standard in the ADA, since the Twenty-First Century Act applies only to equipment manufactured after its effective date and services offered after the effective date.<sup>41</sup> Dr. Vanderheiden stated that:

“It is arguable that the proper standard is similar to the ADA new construction standard, which requires accessibility unless it is ‘structurally impracticable.’ This is a significantly higher standard. However, ‘achievable’ in the Act limits the requirement to a ‘reasonable’ level of expense.”<sup>42</sup>

Dr. Vanderheiden’s analysis of the Act further concluded that:

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<sup>40</sup> Twenty-First Century Communications and Video Accessibility Act of 2010, PL 111-260, §101, October 8, 2010, 124 Stat. 2751.

<sup>41</sup> See Vanderheiden Trace RERC Comment.

<sup>42</sup> *Id.* at 4.

“in contrast to Section 255 and the ADA, the factors do not emphasize the financial resources of the covered entity, but, instead, ask the extent of the ‘impact’ of the steps needed to achieve accessibility. Only if the technical or economic impact is ‘unreasonable’ should accessibility be found un-achievable. This ‘unreasonable impact’ standard should be interpreted similarly to the ‘undue hardship’ standard of the ADA.”<sup>43</sup>

An “unreasonable impact” standard similarly interpreted to the “undue hardship” standard of the ADA would be reasonably applied to user-testing. “Undue hardship” takes into account not only the “financial realities” of an entity, but also refers to any accommodation that “would be unduly costly, extensive, substantial, or disruptive, or that would fundamentally alter the nature or operation of the business.”<sup>44</sup> User-testing for any product is typically limited by the financial realities of entities as well as the nature or operation of the business, thus incorporating that standard would meet all of the Act’s specific achievability factors regarding (1) nature and cost, (2) technical and economic impact, (3) type of operations, and (4) extent of other accessible offerings.

### **III. TWENTY-FIRST CENTURY COMMUNICATIONS AND VIDEO ACCESSIBILITY ACT APPLIES TO COGNITIVE DISABILITIES**

The Twenty-First Century Communications and Video Accessibility Act should apply to cognitive disabilities, first, because the Act refers specifically to cognitive disabilities. Second, although there are arguments against the inclusion of cognitive disabilities, on the grounds that cognitive accessibility is difficult to ensure, we argue that user-testing as stated above would allow for cognitive accessibility to be supplied in many cases.

The Act refers specifically to the definition of disability set forth in Section 3 of the Americans with Disabilities Act (“ADA”) of 1990, 42 U.S.C. 12102.<sup>45</sup> The definition of disability as “physical or mental impairment that substantially limits one or more of the major

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<sup>43</sup> *Id.* at 4.

<sup>44</sup> 29 C.F.R. Pt. 1630, App.

<sup>45</sup> *See* 47 U.S.C. 153, §3(55); Twenty-First Century Communications and Video Accessibility Act of 2010, PL 111-260, §101, October 8, 2010, 124 Stat. 2751.

life activities of such individual” specifically alludes to mental impairments.<sup>46</sup> Other federal agencies have also accepted the application of the ADA to cognitive disabilities.<sup>47</sup> Additionally, the Access Board also incorporated cognitive disabilities into its 1998 regulations for the Telecommunications Act.<sup>48</sup> Currently, the proposed amendments to Section 255 regulations include the requirement of operability with limited cognitive skills.<sup>49</sup> The Access Board Draft Guidelines do not currently include this requirement; however the FCC should retain this coverage, despite its omission from the Access Board Draft.<sup>50</sup>

The key argument *against* the coverage of cognitive disabilities in ensuring advanced communications services accessibility is that it is difficult to describe specific, sharply defined design features that ensure cognitive accessibility (though some sharply defined features, such as compatibility with text to speech tools, do exist). Rather, necessary characteristics of accessible technology for those with cognitive disabilities resist simple specification. For example, “use of clear and simple language”, or “use of simple navigation structure” are both necessary for the accessible designs of user interface, particularly with cognitive accessibility. A navigation menu on a phone is a good case study in design process for cognitive accessibility. Phone navigation menus where basic functions (like alarm clocks or text-messaging) are difficult to find immediately pose difficulties for all users. For a person with full cognitive capabilities, there is some frustration or irritation when such basic functions cannot be found. However, a person

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<sup>46</sup> 2 U.S.C. §12102.3

<sup>47</sup> “Physical or mental impairment means: . . . Any mental or psychological disorder, such as mental retardation, organic brain syndrome, emotional or mental illness, and specific learning disabilities.” 29 C.F.R. 1630.2.

<sup>48</sup> The regulations require the input, control, and mechanical functions of telecommunications equipment and customer premises equipment to be readily accessible and usable by individuals with cognitive disabilities. 36 C.F.R. §1193.41. The regulations also specifically state that it addresses the “access needs of individuals with disabilities affecting hearing, vision, movement, manipulation, speech, and *interpretation of information*.” Telecommunications Act Accessibility Guidelines, 65 C.F.R. §§ 5608, 5625 (emphasis added).

<sup>49</sup> NPRM at 66.

<sup>50</sup> See United States Access Board, *Draft Information and Communication Technology (ICT) Standards and Guidelines*, (Mar. 17, 2010) (“Access Board Draft Guidelines”).

with a cognitive disability (like lack of immediate or short-term memory) might never be able to access such functions if their lack of memory retention does not allow them to navigate such a phone at all. They might experience repeated failures, never arriving at the desired basic function, because their lack of memory retention. Unfortunately, while it is easy to state the issue of navigation difficulties in general terms, specific guidelines for avoiding these difficulties are not available.

Reluctance to require manufacturers to engage with these more difficult to specify or quantify characteristics has led the Access Board Guideline Draft writers to omit these requirements, while other guideline writers have given these requirements lower priority. This reluctance is understandable. However, the FCC should require cognitive accessibility, despite the lack of sharply defined design characteristics that assure it. Ordinary usability rests on the same kind of vague and hard-to-define characteristics needed to ensure accessibility for people with cognitive limitations. Despite the lack of sharply defined characteristics that assure usability, vendors nevertheless consistently are able to produce usable products. As discussed above, the key to generally usable products is the widespread application of user-testing techniques to supplement the available design guidelines. It is completely appropriate to require manufacturers to extend this common practice to address the needs of users with cognitive disabilities.

Since user-testing is standard for most devices defined within ACS, extending user-testing to include individuals with disabilities imposes little additional burden. Additional testing specifically with individuals with disabilities can be included in a general usability testing process.

A second argument against the inclusion of cognitive disabilities in regulation is that because there are people with cognitive disabilities whose abilities to understand and use technology are very limited indeed, it is inappropriate or even impossible to require manufacturers to make products cognitively accessible. This perspective confuses the unrealistic goal of providing absolutely universal cognitive accessibility, without exception, with the completely appropriate goal, as suggested in the proposed FCC amendment of the Section 255 regulations<sup>51</sup>, of minimizing cognitive demands to the extent feasible.

#### **IV. CONCLUSION**

For these reasons, the Commission should consider requiring user-testing for accessibility in order to ensure access to advanced communications services and technology as mandated by Congress through the Twenty-First Century Communications and Video Accessibility Act.

Respectfully submitted,

*/s/ Angela Tse*  
Angela Tse  
Student Attorney

Clayton Lewis  
Scientist in Residence, Coleman  
Institute for Cognitive Disabilities

Brad Bernthal  
Supervising Faculty

**University of Colorado School of  
Law – Technology Law and Policy  
Clinic**  
2450 Kittredge Loop Road  
Boulder, Colorado 80309  
303-492-0610

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<sup>51</sup> NPRM at 66.