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DIGITAL MEDIA ACCESSIBILITY

An Evolving Infrastructure of Possibility

Elizabeth Ellcessor

Introduction

Digital and networked media, such as the World Wide Web, initially offered the possibility of many-to-many communication, flexible forms of content presentation and new means of interacting with others. Yet the development of these technologies around an able-bodied norm, seen in the graphical user interface and the rise of audiovisual content, resulted in an online environment that excluded many people with disabilities. In the words of Gerard Goggin and Christopher Newell, digital media, “the very technologies that are supposed to provide the solution to disability,” can “actually build in disability.”¹

This argument stems from a social model of disability, in which disability is understood not as an individual characteristic but as the result of an inhospitable social and physical environment.² Much scholarship on disability access has considered how the social model is implicated in design practices; when tools, technologies, spaces and services are designed for an able-bodied normative body, they reproduce and exacerbate the inequalities of disability.³ To address these exclusions, advocates have argued for increased *accessibility*.

Accessibility is a term used to describe redesigning or supplementing exclusory structures to increase disability access. In the case of digital media, exclusions can happen at the levels of hardware, software or content and various accessibility standards have been developed to render the web, and other digital media formats, usable by and inclusive of people with disabilities. Many of these standards stem from those developed for web content accessibility—the World Wide Web Consortium’s Web Content Accessibility Guidelines (WCAG) 1.0 (1999) and 2.0 (2008) and the US Section 508 standards (2001, newly released in 2017). I refer to both WCAG and Section 508 as “standards” because they are, in the words of sociologist Lawrence Busch, “means of partially ordering people and things so as to produce outcomes desired.”⁴ Standards organize and direct relationships between people, institutions and technologies. Furthermore, I follow architect Keller Easterling in understanding standards as a form of infrastructure, exerting power equal to or greater than traditional forms of governance and producing particular conditions of possibility and impossibility.⁵

Standards, however, are not neutral; they are sites of negotiation and power. As Busch argues, standards are always a site of contestation, precisely because they have important effects in the world.⁶ Furthermore, standards are performative, in that they do not take on meaning until they are enacted. In the case of accessibility, the dominant WCAG standards are a voluntary form of

governance, meaning that they rely upon the choices and actions of individuals, nations and corporations to take effect. Therefore, the history of digital media accessibility is not simply a policy history, or a timeline of events, but an uneven process characterized by tensions regarding technical specificity and intended audience. Though my focus is primarily on accessibility in the US context, these concerns are only amplified in international accessibility efforts, which must also wrestle with the nuances of different scripts, languages and legal contexts.

This chapter looks to the history of web accessibility as it has evolved from a short set of guidelines to a complex framework intended to both *harmonize* with international legal systems and professional needs, and to allow for *variety* in its application to a range of systems, audiences and content. Much of this analysis is made possible through analysis of primary texts, including the records of the Web Accessibility Initiative Guidelines Working Group, the text of US laws and announcements published in the *Federal Register* and draft guidelines and standards documents. I have also conducted over 40 interviews with developers, policy makers and users with disabilities regarding their understandings of and experiences of accessibility; these individuals were largely based in the United States, with a smaller number hailing from other Anglophone nations. Thus, again, this history is not simply a series of events; it is a polyvocal, contested and incomplete story in which particular themes and trends can be observed and contextualized in order to better understand the relationship between disability and digital media. Ultimately, I argue that as digital media accessibility has standardized, it has also become increasingly available, flexible and amenable to diverse interpretations and applications, making it increasingly prevalent and relevant to users with disabilities; increasingly, accessibility standards act as an infrastructure that enables a range of relations between technology, disability and individual experiences.

Early Standardization, Specificity and Audiences

The origins of web accessibility standards in the United States might be traced to an April 1997 meeting at the White House, at which the World Wide Web Consortium (W3C, the international volunteer governing body of the web) launched its Web Accessibility Initiative (WAI), with the support of the US Government. Initial projects were to include developing protocols and data formats to make the Web itself more accessible, including adding video and captioning elements.⁷ This event kicked off a process of standardization that would lead to the development of the first W3C accessibility document, the Web Accessibility Guidelines (WCAG) 1.0, and the first set of legally enforceable standards, the Section 508 standards, which applied to US federal agencies and their contractors.⁸

In truth, of course, there was a longer history to computer accessibility and standardization. Elizabeth Petrick has traced the history of accessibility and the personal computer, arguing that “the development of accessible technologies intersected with a history of civil rights and the emergence of identity politics,”⁹ and that accessible personal computer technology was at once political, legal and social, with its potential for equality reliant upon the widespread incorporation of technological access measures. I have similarly traced the history of the Internet, disability rights legislation and accessibility as they intersected throughout the 1980s, including the passage of the 1986 Amendments to the Rehabilitation Act of 1973, which introduced Section 508 of Title V, the first legal requirement for accessibility of computer equipment for people with disabilities in the federal sphere.¹⁰ Even within the narrower context of the World Wide Web, standards development was underway well before 1997. The Trace Research and Development Center at the University of Wisconsin-Madison released its first set of guidelines, “Design of HTML (Mosaic) Pages to Increase Their Accessibility to Users with Disabilities Strategies for Today and Tomorrow,” in 1995; in subsequent years, along with testing its own practices, Trace

collected and amalgamated accessibility documents that were being developed elsewhere, putting together a central set of best practices. When the W3C began formulating web accessibility standards, they took version 8.0 of the Trace Center's "Unified Guidelines" as their starting point.

Once the WAI working group took over guideline development, it discovered pervasive tensions regarding technical specificity and audience. First, specificity was a sticking point, as many stakeholders wanted the guidelines to be as pragmatic and technologically detailed as possible. This was understood to serve developers and policy makers, both audiences that would need detail in order to produce code and law. On the other hand, too much specificity risked making the guidelines inflexible and causing them to lag behind technological changes. The second tension surrounded the intended audience. As Gregg C. Vanderheiden, chair of the working group, recalled:

There's such a diverse audience. We actually have policy makers who want to make policy about [web accessibility], but won't have a technical background ... We have individuals with disabilities, who aren't going to use [the guidelines document] but want to understand what it does or doesn't do to help them. We have people who are creating web pages, and they want to know what is it that they have to do, and how on earth do you go about doing that?¹¹

WCAG 1.0, released in 1999, attempted to handle its diverse audience and the need for specificity through the development of several different documents, including "frozen," inflexible guidelines and "living" notes and techniques to update technical details.

Nonetheless, WCAG 1.0 was criticized for being overly complex and too technologically specific in its recommendations—many of which were "out of date by the time it was published," in the words of one W3C participant¹²—and impenetrable to a non-specialist audience.¹³ This critique was particularly damning because, as governance without the force of law, WCAG 1.0 relied upon the diffuse community of web developers, companies and individuals adopting these guidelines and implementing the practices laid out in the techniques document. In a very real sense, these standards could not act as infrastructure without implementation; impenetrable language and complex organization, plus quickly out-of-date technical specifics, hindered this process.

The US federal government was also wrangling with accessibility standardization in the late 1990s, following a flurry of legal activity related to disability rights. The Americans with Disabilities Act (ADA) passed in 1990, enshrining equal rights protections, the Telecommunications Act of 1996 broadened requirements for closed captioning and introduced Section 255, which required manufacturers and service providers to make equipment and services accessible to people with disabilities whenever "readily achievable,"¹⁴ and the Rehabilitation Act was amended again in 1998. This version of Section 508 established that a variety of digital technologies, including "Web-based information and applications," be accessible to federal employees and required that disabled employees and members of the public seeking federal services "have access to and use of information and data that is comparable to the access to and use of the information and data" by peers who do not have disabilities.¹⁵ This version of 508 tasked the Architectural and Transportation Barriers Compliance Board (often referred to as the Access Board), with writing policies and directives for enforcement.

To do so, the Access Board assembled the Electronic and Information Technology Access Advisory Committee. In addition to government personnel, participants on the Advisory Committee included leaders in accessibility from academia, the W3C, industry organizations and technology corporations, as well as disability advocates. Section 508 standards developed with a focus on legal enforceability via specificity and a presumption of a limited government audience. In

a context in which federal agencies would be liable to lawsuits for failure to comply, standards needed to be made as clear as possible both to implement and to interpret, while being written in regulatory language. In order to ensure enforceability, Access Board official Doug Wakefield recalled relying on existing laws regarding disability, accommodations and physical accessibility whenever possible.¹⁶ The need for legally enforceable clarity resulted in an emphasis on specificity, and an acknowledgment that standards could only address some forms of accessibility (and some forms of disability); cognitive impairments, in particular, were prohibitively difficult to address in specific and enforceable standards. Though Section 508 standards based many recommendations on the guidelines found in WCAG 1.0, they eliminated anything requiring subjective judgments, and rephrased many other guidelines into more prescriptive legal language. The need for legal enforceability led to a clearer conception of audience than was seen in WCAG 1.0. The primary audience would undoubtedly be those web developers and managers tasked with bringing government sites into compliance with Section 508. This audience was understood to be willing to comply and merely waiting for instructions.¹⁷ Yet, this audience would expand quickly, as state governments and institutions that received federal funding (particularly universities) adopted 508 standards. The original, limited audience addressed by the standards would eventually prove a challenge, as a broader audience looked to create accessible websites that complied with the law.

The Section 508 standards were published in final form in the *Federal Register* on December 21, 2000, and enforcement of the standards began on June 21, 2001. This concluded the initial phase of web content accessibility standardization, in which questions of technological specificity and intended audience were largely unresolved, leading to confusion and slow implementation. As mentioned, WCAG 1.0 was quickly targeted for criticism; similarly, Section 508 was quickly found to be ineffective. Various studies indicated that awareness of accessibility practices and adherence to these standards remained low in the early twenty-first century, even on sites legally required to conform to 508.¹⁸ Future development of accessibility standards would take these lessons to heart, increasingly working in concert through harmonization efforts and allowing for a variety of implementations.

Harmonization and a Professional Context

The second phase of digital media accessibility standardization followed quickly on the heels of the first. The working group that produced WCAG 1.0 took only a very brief break before beginning work on updated recommendations, culminating in the December 2008 release of WCAG 2.0. The long duration stemmed from fatigue, in-fighting and conflicting understandings of the group's work and a bureaucratic process that prioritized the construction of a "full consensus" document.¹⁹ The difficulties of specificity and audience raised in the first phase reemerged, stronger than ever, in the context of Web 2.0, mobile computing and user-generated-content. Furthermore, seeing WCAG 1.0 taken up as the basis for Section 508—and a host of international legal accessibility standards—indicated that even these voluntary guidelines needed to be aware of a broader context for application and enforcement. Section 508, itself, was also subject to revision in this phase, with efforts beginning with the convention of a new committee in 2006 and extending through the eventual release of new standards in 2017.

This second phase of standards development was marked by an emphasis on "harmonization," which was enabled by a growing professional context. "Harmonization" refers to processes by which accessibility standards and guidelines in various industrial, national and international contexts are brought into agreement in order to facilitate their adoption across borders and industries. In the case of web accessibility, harmonization was an attempt to avoid the problems of earlier standards; according to Shadi Abou-Zahra, of the W3C International Program Office, adopting

regulatory measures piecemeal led to fragmentation and hindered implementation of accessibility.²⁰ Harmonization was supported by a growing professionalization of accessibility. While accessible web development began as a niche, voluntary practice, adopted by a range of developers with varied experience, it grew into a professional specialization in the early twenty-first century. Consultants, boutique firms, advocacy groups, corporate divisions, training modules, textbooks and other indications of professionalism emerged, promoting adherence to existing standards. This, in turn, resulted in a larger, more informed and more receptive audience, engaged in both the formation and uptake of standards.

WCAG 2.0 attempted to directly address the problems of specificity and audience through a totally new, principle-based structure. The core principles of WCAG 2.0 are that content should be perceivable (able to be read or understood), operable (usable via a range of interfaces), usable (a concept similar to usability or user-friendliness) and robust (transformable, unbreakable); together, these are referred to as the POUR principles. This structure connected accessibility to popular digital media concepts such as personalization, usability and flexibility, potentially increasing its perceived relevance in web development fields.²¹

The POUR structure also enabled principles to be separated from technological specifics, which reside in frequently updated supplemental documents. Thus, “techniques” or “how-tos” are updated in accordance with technological changes, new capabilities and changing needs, while the principles remain static and provide a high-level theoretical understanding of accessibility. For instance, alternate text, or alt text, is a textual description of an image that conveys the image’s content to a user who cannot see it. In WCAG 1.0, alternate text was covered in Checkpoint 1.1, which read, in part, “Provide a text equivalent for every non-text element,” and was followed by specific examples of implementation.²² In WCAG 2.0, alternate text was Guideline 1.1, housed under the Perceivable principle. It stated, “Provide text alternatives for any non-text content so that it can be changed into other forms people need, such as large print, braille, speech, symbols or simpler language.”²³ The 1.0 checkpoint emphasized the desired action, while the 2.0 principle emphasized the desired result and referred readers to supplementary documents for explicit instructions. The second structure explained the motivation of the guideline, without technical or instructional specificity, enabling it to be adapted over time and contexts.

Furthermore, the POUR principles were friendlier to a growing audience and broader context for standardization. A participant in the WCAG process recalled that “there was a good sense that if we had something that was good and solid, it would likely be adopted and become a best practice in the industry,” but that accommodating the range of voices at the table was one of the hardest parts.²⁴ In 2005, the working group adopted a consensus-based decision-making process, ensuring that these diverse voices were recognized and addressed. By removing technical specifics and operating via a consensus procedure, WCAG 2.0 grew into a flexible structure for accessibility that was widely targeted for harmonization. WCAG 2.0 has exerted significant productive power within a range of legal and professional contexts, while also being taken as the basis for accessibility laws in numerous contexts. WCAG 2.0 AA conformance was adopted by the European Commission as the goal for all EUROPA sites created after January 2010 and is referenced in Mandate 376, which calls for harmonization of European IT accessibility standards. Additionally, the laws of Australia, Canada and New Zealand directly reference WCAG 2.0, and in 2013, WCAG 2.0 became an ISO International Standard, ISO/IEC 40,500, allowing its use in the policies of countries that only use ISO standards. The expansive use of WCAG 2.0 is also evident in the creation of a draft document dedicated to applying it to non-web technologies.²⁵

The Section 508 Refresh has also aimed for this kind of harmonization. The 2008 report from the Telecommunications and Electronic and Information Technologies Advisory Committee (TEITAC) recommended harmonization with a number of ISO standards, as well as WCAG 2.0, as “harmonization with international standards and guidelines where appropriate may also

benefit agencies, service providers, manufacturers, and people with disabilities.” One TEITAC participant recalled that “people were overwhelmingly supportive of our interest and attempts at harmonizing with the WCAG version 2.0 accessibility standards, because they’re already referenced around the world and a lot of people are already familiar with them.”²⁶ The final rule, released by the Access Board in March 2015, makes harmonization explicit. Rather than rewriting WCAG 2.0 into enforceable standards, as in the previous Section 508 standards, the new standards refer directly to WCAG 2.0 and require its success criteria to be applied to web content as well as any online documents and software.²⁷

Standards harmonization is also important for the growing professional context of accessibility. For many in the IT and web-related industries, including major industry players such as Google, IBM or Apple, harmonized accessibility standards represent a financial savings and a reduction of liability risk. As one industry representative explained, “we want to have a standard to comply with and not have fractured version[s] of that standard in different localities that we have to support.”²⁸ Ultimately, many accessibility experts foresee a harmonization process in which corporations’ internal policies, or “frankenstandards,”²⁹ are aligned with WCAG 2.0 and upcoming federal standards.

Broad agreement on harmonized standards facilitates the development of accessibility as a professional field, ensuring a consensus about what it means to “do” accessibility. As a result, many who work in accessible computing and web development support harmonization as a means of defining their work and ensuring quality. Currently, the International Association of Accessibility Professionals (IAAP) is taking the lead in defining accessibility as a profession. The IAAP has 31 founding members, including major technology firms, large banking corporations, advocacy groups, accessibility consulting firms and assistive technology providers, and has developed educational resources, put together events and overseen the development of certification programs. Like WCAG 2.0, the IAAP is invested in consensus and harmonization; Andrew Kirkpatrick, Group Product Manager of Accessibility at Adobe, stated (prior to the IAAP’s launch) that it was “important for us to try and do it well and that means including people, listening to different ideas and trying to achieve a consensus about the best approach.”³⁰ Here, as in the standards themselves, the second phase of accessibility standardization is marked by an investment in harmonizing diverse voices and forming a flexible, agreed-upon understanding of accessibility as concept, practice and vocation.

Variety and Digital Media Accessibility

Given the ascendancy of harmonized standards, it would appear that web content accessibility is more unified than ever; paradoxically, this has also made it more varied in its applications. Mobile media and video games are just two arenas in which these effects can be felt, as principles are picked up and reapplied, creating an ecosystem in which digital media accessibility can expand beyond explicitly standardized contexts.

“Mobile media” is a term used to refer to text messaging, operating systems, web browsers, “apps” (applications) and other tools and services available on cellular telephones and similar devices (iPods, tablets, e-readers, etc.). The W3C’s first attempts to create standards for mobile media drew explicitly on WCAG 1.0: the Mobile Web Best Practices (MWBPs) were “in part derived from the Web Content Accessibility Guidelines.”³¹ The Mobile Web Application Best Practices, released by the W3C in 2010, notes that “new interaction methods are likely to emerge in the future, particularly in the fields of voice and assistive technology.”³² This indicates that the design and development of mobile applications and hardware was indebted to the field of assistive technology, and thus to the tradition of accessible computer and Internet development. Mobile media is also newly subject to the Twenty-First Century Communication and

Video Accessibility Act (CVAA, 2010), which required smartphones and other advanced communication services to be compatible with hearing aids and to allow web access for visually impaired users, as part of requiring general accessibility to people with disabilities. The revisions to Section 508, and its harmonization with WCAG 2.0, occurred in concert with the process of developing standards for the enforcement of CVAA, the overhaul of standards for Section 255 of the Telecommunications Act of 1996 and the development of standards by the Department of Justice for the application of the ADA to the Internet.³³ Released as a final rule in January 2017, compliance to the 508-related standards will be required beginning in 2018; 255 related standards are pending adoption by the Federal Communications Commission.

A second case of the expansion of digital media accessibility is seen in video games. Not subject to any standards, video games nonetheless may offer accessibility features such as captioning, simplified or alternative input devices or voice-input, among others. One of the leading sources for information and advocacy related to game accessibility is the AbleGamers Foundation. It hosts an online community for gamers with disabilities, including a website, Twitter usage and regular accessibility reviews of major game releases. In 2012, AbleGamers launched the “Includification” project, a set of voluntary standards for accessible video game development that were produced with the participation of several major video game companies. Much like WCAG 2.0, it “does not explain the technical ways to design a video game. Instead, it explains the most important accessibility options that can be included into a video game and what each one of them means to the end-user,”³⁴ focusing on principles rather than technical specifics. Though Includification incorporates elements of WCAG 2.0, it does not reference it directly, and is not part of a broader harmonization effort. However, this is a case in which regulation of accessibility in one arena has led to partial incorporation of those discourses in a different field.

Mobile media and video games demonstrate a progression from limited web accessibility standards to a robust infrastructure for digital media accessibility. The principle-based structure of WCAG 2.0, efforts at wide-scale harmonization and a growing professional community enable the lessons and practices of web accessibility to be broadly applied in a variety of technological, institutional and social contexts. Furthermore, it appears that this growth increasingly recognizes people with disabilities as both users and producers of content, interested in information, communication and entertainment uses of digital media. Where earlier standards presumed a limited audience of developers producing digital media for an audience of people with disabilities, flexible standards for diverse audiences enable people with disabilities to become authorities on accessibility and act as producers. For instance, disabled blogger Glenda Watson Hyatt has translated the POUR framework into a set of materials that explicitly explain accessibility measures and practices to people using commercial blogging software.³⁵ Similarly, users of the Tumblr site *F*ck Yeah, Accessibility* share tips and tricks to address the shortcomings of Tumblr’s code and make content more accessible to a wide audience, with many users with disabilities teaching one another about accessibility and its practices in an informal and interest-driven context. Users with disabilities blend consumption and production, creating new kinds of accessibility and enabling others to do the same.

Conclusion

This chapter has offered a brief sketch of the history of digital media accessibility in the United States, and the ways in which tensions regarding specificity and audience have been addressed through harmonization and professionalization. As a result, these standards have become an infrastructure that is the basis for a variety of applications, reaching new forms of digital media accessibility and connecting with broader audiences, including users with disabilities. Digital media accessibility is many things to many people. It is access to a range of tools,

services, information, interaction and entertainment via hardware and software. It is a professional practice and a legal standard. It is also a deeply personal experience, forged in the specific material, sociocultural and embodied contexts of individual users. As a kind of infrastructure, digital media accessibility standards are an “overt point of contact and access between us all,”³⁶ producing particular, intersectional articulations of bodies, technologies and societies. As infrastructure, digital media accessibility creates possibilities for action and inaction, inclusion and exclusion; it mediates variable articulations of users, technologies, policies and activities.

This understanding of accessibility works in concert with a relational conception of disability and access, in which these phenomena are neither located within the individual nor within society (as in the social model of disability), but are produced in their intersections. Disability studies scholar Alison Kafer proposes a “political-relational model” of disability;³⁷ unlike the social model, which locates disability in a simplified social context, this model sees disability emerging from the interactions of embodied experiences of pain, social and physical barriers and experiences of inequality. Canadian disability scholar Tanya Titchkosky similarly argues that access is relational, emerging in the nexus of bodies, artifacts, social norms, ideologies and other rich contexts.³⁸ Access is not a single state, but a complex and varied relationship. Accordingly, it seems that accessibility is a relational phenomenon, intervening in relations of access and ability in order to produce new relations and new possibilities.

Increasingly, harmonized accessibility standards supported by professional practices and expanding into a variety of digital media contexts represent an infrastructure for digital media accessibility. Insofar as this infrastructure that allows for flexible relations between individuals, technologies and desired uses, it may provide the conditions of possibility for people with disabilities to enter into a range of desired, active and self-directed relationships with digital media. In doing so, digital media accessibility acts as a positive force for increasing digital media access and ameliorating the inequalities of disability.

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