Expertise and Policy Influence of W3C's Web Content Accessibility Guidelines (WCAG)

Research Paper submitted to the Department of Engineering and Society

Presented to the Faculty of the School of Engineering and Applied Science

University of Virginia • Charlottesville, Virginia

In Partial Fulfillment of the Requirements for the Degree

Bachelor of Science, School of Engineering

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Spring 2025

On my honor as a University Student, I have neither given nor received unauthorized aid on this assignment as defined by the Honor Guidelines for Thesis-Related Assignments

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Introduction

I used to hate writing alt text for images. It's tedious, not code, it never felt like it was "my job," and I only ever saw its purpose as the descriptions that show when an image won't load. What seemed so insignificant to me before is, in fact, essential for users who rely on screen readers to navigate the web. After coding for 9+ years, it was only recently that I made that realization. This past summer, I worked as a software developer intern at a small startup company where I was tasked with designing web-based solar tools. These tools are publicly accessible on the internet as web pages designed to connect clients of all experience levels to curated at-home DIY solar information and technology. Because of the timeline of the project, my supervisor and I moved fast and, not realizing it at the time, we cut many corners in the process. Corners that might not affect people like my boss and I and how we interact with the software, but the too often marginalized people with disabilities who face difficulties using the internet every day. The irony of the role was that while I was building a tool to enhance accessibility in solar, I was actively applying habits that discriminated against those with disabilities. I finally learned of my mistakes when I began to study web accessibility.

Web accessibility is often overlooked, not just by junior devs. In a study that analyzed more than 3,500 websites across 22 industries, it was found that 79% of the sites contained three or more types of severe accessibility issues (Curtis, 2022). In the same study, 55% of homepages were found to be missing alt text for their images. One can hear my story on alt text and quickly dismiss it as a problem with the developer and not some broader culture or systemic issue. Speaking from my point of view, I was never taught by my mentors the importance of alt text until I learned of web accessibility guidelines. These guidelines help ensure that content is usable by individuals with a wide range of impairments, including visual, auditory, motor, and cognitive

disabilities. The most popular and influential of these guidelines is the Web Content Accessibility Guidelines (WCAG). The WCAG is a set of internationally recognized standards created by the World Wide Web Consortium (W3C) to make websites and digital tools more accessible to people with disabilities.

While the WCAG remains highly influential because of the varied expertise spanning technical innovation, policy integration, and accessibility advocates, the interactional expertise of disabled individuals themselves is often neglected. The literature review I conducted emphasizes the existing approval of the WCAG but highlights issues and delays in introducing the standard to legislation. Despite this, research suggests that this hasn't stopped the WCAG from playing a major role in accessibility cases in court, continuing to prove its influence. I chose to expand on previous work by examining the different forms of expertise that contributed to the guideline's established influence and its continued development. To do this, I analyzed publications and documents by advocacy groups, accessibility experts, policy-makers, and the W3C itself and their subgroups. In addition, I examined the demographics of W3C experts, the processes of contribution, the articles produced, and the division of labor from the W3C website. I discovered that a wide range of experts all played a role in cementing WCAG as the international standard, but those with disabilities are far more overlooked and unincorporated. I concluded that the WCAG has a strong foundation and history as the first and most integrated set of web accessibility standards, which, at times, is sufficient evidence for adoption. Despite existing at the forefront of guidelines, the design process is still not supported enough by direct research with the people it was written to serve.

Literature Review

Since its initial release in 1999, the WCAG 1.0 and subsequent versions have been immediately influential. The guidelines have been widely endorsed by organizations and experts within the tech industry, in part because many contributors to the WCAG are themselves industry professionals, representing leading companies and advocacy groups, but they have also been widely accepted by organizations outside of tech as well. Research overwhelmingly supports the idea that WCAG has become the foremost standard by which digital accessibility is measured with widespread international acceptance. In a 2006 United Nations audit of global web accessibility conducted by the design agency Nomensa, 100 leading sites from 20 different countries were assessed using WCAG's measure of conformance (Nomensa, 2006). In the audit introduction, the reason WCAG was chosen was that "[WCAG 1.0] form the globally recognised basis for accessibility on the web" (p. 6). More recently, the *Accessibility Guidelines for United Nations Websites* (2013) mandate that all UN sites conform to level AA, the recommended level of compliance by the guidelines, where the measure rates A, AA, or AAA indicate increasing levels of accessibility.

In addition to the UN's sites, legislation often relies on WCAG to support web accessibility policy. In their research, Kelly et al. (2005) claim that "as a stable and referenceable document, WCAG is widely seen as a standard to which legislation and policy can refer, directly or indirectly" (p. 50). Moreover, many countries have incorporated references to the WCAG or the A/AA conformance metric in their legislation because "policy‑makers found them to be a convenient tool for determining whether a website is accessible" (Ribera et al., 2009, p. 1171). However, it is important to note that incorporation doesn't always mean codifying the guidelines into direct law. Legislation will sometimes advise meeting level AA conformance but won't

make any more reference to the guidelines. In other cases, such as the United States' Section 508 of the *Rehabilitation Act* (2018), which mandates federal agencies make their electronic services accessible to people with disabilities, conformance is a legal requirement, but only for official U.S. government sites.

However, despite many references to the guidelines and the long-standing support for WCAG, historically, web accessibility policies have taken a long time to be directly codified into law in many jurisdictions. Section 508, for instance, was not revised until 2018, nearly two decades after the release of the first version of WCAG (Tracy, 2014). The absence of enforceable guidelines is most evident in legislation for the private sector. The Americans with Disabilities Act or ADA does not yet define a technical standard or a specific level of compliance for web accessibility for private businesses. This allows businesses a lot of flexibility in how they implement accessibility features into their sites, and many lawsuits have resulted because of it (Lazar, 2019). In addition, in an older study, Kelly et al. (2005) found in their examination of international legislation, the United Kingdom, United States, Italy, and Australia all either had no mention of websites in their respective accessibility legislation or if there was, it didn't apply to private business.

Slow adoption has not stopped the WCAG from influencing the application of law in court cases in common law countries like the United States or Canada. *Jodhan v. Attorney General of Canada* (2012) is a well-known case in web accessibility of a visually-impaired individual taking legal action against the Canadian government over the inaccessibility of government websites, where WCAG was included as evidence. The case established the precedent that accessibility to government websites is a right for people with disabilities and the government must ensure this (Lazar, 2019). So while lawmakers didn't explicitly set this out, this

case and the WCAG were still able to make a case for accessibility in government sites in Canada and formed the basis for the policy going forward. Moreover, settlements involving American companies H&R Block and Peapod both required compliance with WCAG 2.0 AA (Lazar et al., 2015). There have been many other instances like this in America where the courts have sided with the plaintiff's plea for disability accommodation, ruling that the ADA applies to a firm's website (Peters & Bradbard, 2010). WCAG was also either introduced as evidence to define accessibility conformance or directly cited as the standard for compliance in the resulting settlement. So while progress has been slow and could take many more years before an impact is made in private law, that hasn't stopped the WCAG's influence from having a significant impact on legal interpretations and enforcement.

With past research demonstrating the global outreach WCAG has and its growing place in legislation, I want to build on this work by exploring the question of what built this widespread acceptance and if it is an honest union of relevant expertise. To conduct my research, I utilized concepts of the different forms of expertise in the sociology of scientific knowledge (SSK). SSK studies how scientific knowledge comes to be and how it isn't always simply discovered but rather shaped by social factors like politics and interests. The primary form of expertise I intend to focus on is interactional expertise, the expertise of people who don't directly produce expert knowledge but can still fluently communicate with experts (Collins, 2004). This contrasts with someone who has contributory expertise which is the opposite–expertise of a person who actively participates in producing expert knowledge. This framework states that experts don't necessarily need contributory expertise to contribute to discussions and decisions made in a domain. There are groups of people often overlooked because they don't contribute directly to the domain of knowledge through experimentation but can still carry valuable insights

because of their interactional expertise. By using SSK as my framework, I uncover the degree to which expertise from advocacy groups, accessibility specialists, tech giants, policymakers, people with disabilities themselves, and the developers of the WCAG is accounted for in current and future versions.

Methods

The methodological approach I used was a policy analysis to analyze various forms of expertise that influence the WCAG's moderation and application. This included examining the current staff and hierarchy of members of the World Wide Web Consortium, the process and requirements for joining the team of contributory experts, their subgroups and "task forces", and their methodologies. By exploring W3C's website, I discovered the groups/people they claim to consult and the methods they use for doing so. I read articles and reports from various advocacy and disability rights groups to discover their participation and opinions on WCAG. These publications range from the early 2000s when the WCAG was new to the present day. To examine how technical expertise is examined on the lawmakers' side, I utilized government reports and the preambles of amendments to legislation that included references to the WCAG and the rationale behind it. I will also look at government statements about recent or new amendments going into effect and assess the current state and future trend of WCAG adoption.

Established Authority

Since its creation, the WCAG has quickly become a globally influential framework for digital accessibility by leveraging the authority and expertise of established individuals and organizations. The W3C, led by Tim Berners-Lee the inventor of the Web, was already the de

facto standard-setting body for web technologies like HTML, CSS, etc. (World Wide Web Consortium [W3C], n.d.-d). That institutional authority already gave WCAG legitimacy by association from the get-go.

With immediate support, it wasn't long before the WCAG was officially adopted as an international standard by the International Organization for Standardization (ISO) and the International Electrotechnical Commission (IEC) in 2012, under the designation ISO/IEC 40500:2012. While Bernes-Lee was well-known, ISO is a different level of status, being globally recognized with professionals from 172 countries (Thome, 2024). By becoming a standard, the WCAG's credibility is not only bolstered but also businesses, organizations, or any entity with a website can be assessed by a trusted third-party organization and confirmed to be in line with the published ISO standard. Certification is a quick way for sites to immediately improve their trustworthiness upon first visit and show commitment to the specialized needs of the disabled. This process of accreditation by a larger standardizing body leverages ISO's extensive network of experts, drawing on both contributory and interactional expertise to further elevate WCAG's legitimacy. In addition, as an ISO standard, countries that previously adapted WCAG 2.0 may now be able to adopt WCAG 2.0 as is by referencing ISO/IEC 40500 (W3C, n.d.-g). Therefore, not only does ISO build on the WCAG's authority but also furthers its influence by allowing its adoption in countries' policies, which has its own influence as it spreads internationally and intranationally.

Along with trusted authorities, the WCAG's legitimacy is also supported through public approval or sponsorship by experts from many advocacy groups and tech leaders. The International Association of Accessibility Professionals (IAAP), a nonprofit with professionals from around the globe dedicated to improving the accessibility of people worldwide, references

the WCAG in their certification programs (n.d.). The certifications offered by IAAP certify a group of accessibility practitioners called Web Accessibility Specialists (WAS). Aligning WAS certification with WCAG further institutionalizes the guidelines as the global measure of accessibility by which accessibility experts should follow. Moreover, the W3C is sponsored by the Ford Foundation, Technology and Society Program, US National Institute for Disability, Independent Living and Rehabilitation Research (NIDILRR) and was previously sponsored by the European Commission WAI-DE, IBM, Microsoft, SAP, and more (W3C, n.d.-f). Sponsorship by these established institutions lends both credibility and resources to the initiative, helping to legitimize its goals and attract other expert participation. The support from research funders like the Ford Foundation and NIDILRR grants legitimacy to the accessibility work WAI does and tech giants like Microsoft legitimize the feasibility of the technical application.

Another popular advocacy group that has granted their favor to the W3C is The National Federation of the Blind (NFB). In a statement, the NFB applauded the DOJ for finalizing the web and mobile content accessibility rule in Title II of the ADA (2024). In addition, Amy Mason, a blind editor for the NFB, is a vocal advocate for regulatory backing of the WCAG in America (2023). The knowledge that advocacy groups hold that technical experts can never fully attain is their lived experience and worldview. Approval from groups like the NFB is arguably the most important and the support from members like Mason, those the WCAG was created for, are what most people would look to when determining the authenticity of the guidelines.

Public Policy Expertise

Before the WCAG's inclusion in Title II of the ADA, the DOJ conducted its own research on its feasibility in regulation. Title II prohibits discrimination on the basis of disability

by state and local government and as of April 2024, this now officially includes web and mobile content (U.S. Department of Justice, 2024). While it's another example of legislation taking far too long, the research conducted and detailed in the Notice of Proposed Rulemaking (NPRM) before the final rule was published illustrates careful consideration in picking the WCAG. One reason they cite is that they expect that public entities are already familiar with WCAG because of how long it has existed and how many members of the public and governmental entities are already exposed to it ("Accessibility of Web Information," 2023). This is supported by their finding that 48 of 50 states try to or intend to use a WCAG 2.0 standard or greater for some of their web content. The DOJ doesn't directly contribute to the technical writing of WCAG, making them the interactional experts in this instance. Rather than simply deferring to WCAG's long-standing reputation, the DOJ examined for themselves the legitimacy of the guidelines. This displays that their endorsement stems not only from WCAG's historical authority but also from active, evidence-based assessment which strengthens the use of the WCAG in American regulation.

Another evaluation the DOJ conducted was a cost-benefit analysis of codifying and enforcing WCAG standards. In the same NPRM (2023), it was calculated that over the first 10 years after the publication of the proposed rule, the net annualized benefits would total between $1.5 billion to $1.9 billion. The benefits estimated in their calculations included time savings for current users of State and local government entity websites, time savings for current mobile app users, and earnings from additional educational attainment. Here we see the DOJ contributed to the existing research another form of expertise–regulatory expertise. While for nongovernmental organizations, the established legitimacy of the WCAG is enough to attach a reference to the guidelines with no research of their own, amending it to Article II requires more care. What the

DOJ adds is not only the feasibility of codifying and enforcing the WCAG on public sector sites but the monetary benefit as well.

AG Working Group Demographics

Building on my analysis of the external expertise that shaped the WCAG, I turned my focus to the individuals directly involved in its development and their demographics. The writers of the WCAG form a group within W3C called the Accessibility Guidelines (AG) Working Group. Within the working group, participants are split between members representing a W3C Member organization and individuals who bring particular expertise to the group and are invited to participate as "Invited Experts" (W3C, n.d.-e; W3C, n.d.-b). To determine what expertise is represented in the working group, I analyzed the demographics of the current organizations and people listed on the site's "Participants" page. As shown in Table 1, what I discovered is that members representing North American organizations make up nearly the majority of participants at 49.23%. The next largest group is the Invited Experts who were identified separately as they participate independently and do not have geographic information listed. The other regions, Europe, Asia, South America, and international make up the rest and are far less represented, and some regions aren't represented at all.

Table 1

Distribution of Regions of Organization/Groups Represented by Members

Region/Group	# of Participants	Percentage
North American Organizations	128	49.23%

European Organizations	41	15.77%
Asian Organizations	20	7.69%
South American Organizations	1	0.38%
International Organizations	9	3.46%
Invited Experts	61	23.46%

Note. Invited Experts do not represent an organization like other participants representing a W3C Member Organization and aren't required to provide geographic information and thus aren't regionally distinguishable. Data compiled from *Accessibility Guidelines Working Group - Participants* by W3C, n.d. (https://www.w3.org/groups/wg/ag/participants)

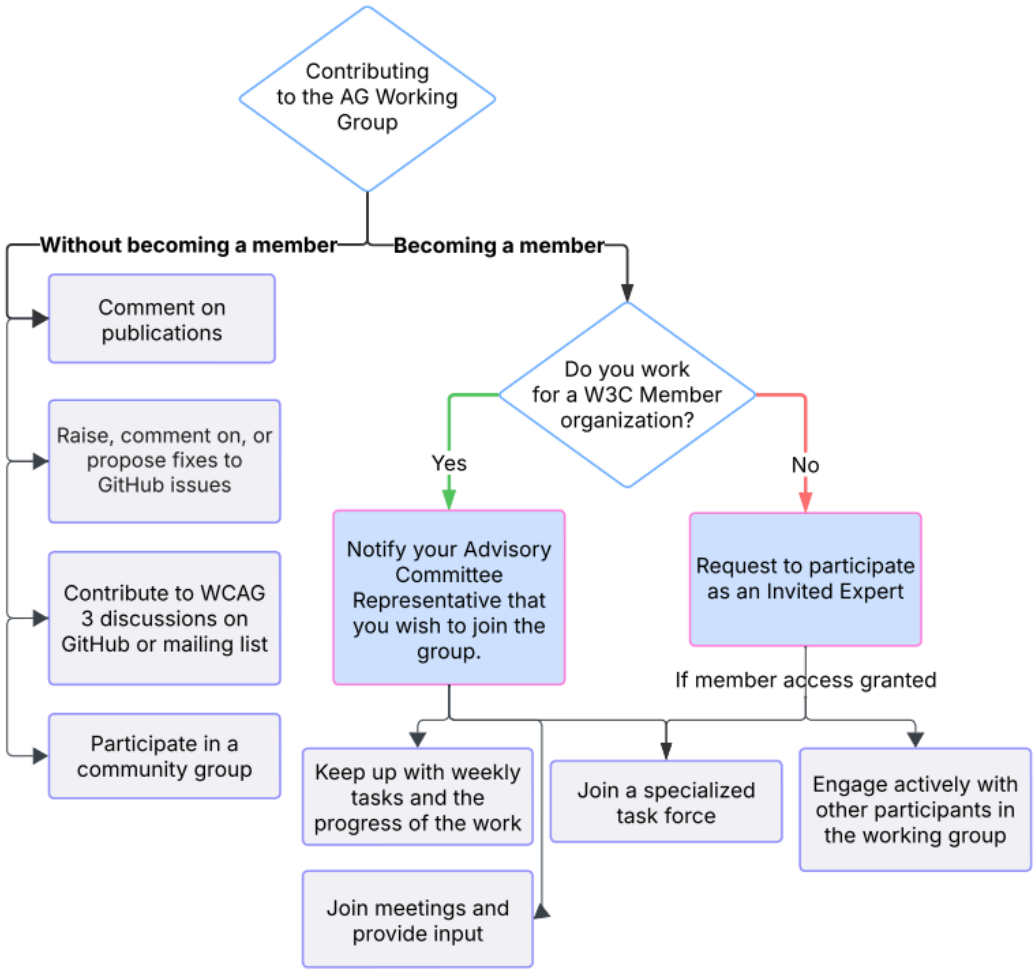
Not only is North America overrepresented over other regions in the working group, but organizations over independent members are as well. This isn't inherently problematic, however, until you consider what types of organizations make up the vast majority. Only twenty-five of the sixty-two organizations represented (40.3%) are non-profits (W3C, n.d.-b). This means not only do organizations outnumber Invited Experts, but the for-profit corporations including Amazon, Google, and Microsoft also outnumber the non-profit organizations. While adverse conclusions cannot immediately be drawn based on demographics alone, certain patterns do raise concern. Conversations about how gaps in participant representation are addressed in the working group become far more significant and the results produced are subject to more scrutiny.

Interactional Expertise Overlooked

As I became more critical of how technical experts incorporated the tacit knowledge of underrepresented disabled individuals, I discovered a significant lack of interactional expertise in the design process. Instead, the interactional expertise of technical experts on the disabled experience is more often relied upon than the interactional expertise of the disabled themselves on the technical domain. For instance, the language used by W3C in how accessibility designers should include the participation of people with disabilities in the design process can be viewed as largely consultative (Karasjärvi et al., 2024). Instead of being viewed as collaborators, the W3C describes the disabled community as an extension with which they can consult rather than one they should be directly working with. While interactional expertise can be viewed generally as the idea that any person doesn't need to directly contribute to a field to be capable of engaging in it, its roots are based on including others in the technical domain, not the other way around. That is to say, developers do have an "outsider expertise" on disabilities, but this isn't the same as the interactional expertise Collins conceptualized in his framework. Collins' (2004) social intent behind the term was to uplift the expertise of the marginalized, not justify the minimal collaboration and token engagement that developers deem sufficient.

Figure 1

WAI's Ways of Contributing to the Accessibility Guidelines Working Group



Note. Information compiled from *Accessibility Guidelines Working Group* by Web Accessibility Initiative (WAI), n.d. (https://www.w3.org/WAI/about/groups/agwg)

W3C's treatment of the disabled community as consultants and not experts of their own is further displayed by how they include participation from nonmembers. Included in Figure 1 is a diagram of the different ways contributions are made in the AG working group for both W3C members (discussed previously) as well as nonmembers. The group primarily seeks input via online forums, comments, GitHub, and mailing lists. One could argue that WAI's system of

collaboration does contribute significantly to the development as their GitHub issues page is thriving with interaction with over 1,800 issues raised and addressed. The issue with this, however, is that there are 555 issues still open with the oldest of them created in October of 2016. In addition, there have been 1,516 closed Pull Requests–specific changes that can either be approved or denied ranging from typo fixes to whole paragraph edits– and yet it's shown that there have only been 94 unique contributors to the WCAG via GitHub, most of which are members of W3C. This means there have been very few nonmembers who have successfully had a change accepted. In addition, there are many issues still waiting to be addressed, some silent for numerous years. What this shows is that under the guise of a thriving hub of public collaboration, it is, in reality, a mess of unaddressed problems and a narrow group of individuals making the decisions.

A consequence of the preference for consultation over direct collaboration has been the disproportionate coverage and gaps in cognitive and learning disabilities. Earlier versions of the guidelines neglected cognitive disabilities placing too much attention on the needs of the blind (Ribera et al., 2009). In 2009, the guidelines were already viewed as the forefront of standardization and yet still had glaring holes. These gaps demonstrated the lack of an even and diverse set of expertise across all web-relevant disabilities. To confront this criticism, the Cognitive and Learning Disabilities Accessibility Task Force, or COGA Task Force, was formed in 2013 which conducts user research for the working group on cognitive and learning disabilities. Their list of publications shows that they don't conduct experiments themselves; instead, they rely on existing literature and community feedback to create their design recommendations and user stories (W3C, n.d.-c). This too has been an ongoing criticism with experts calling for more transparent, empirical backing for the recommendations made (Ribera et

al., 2009). Ramkumar (2025), an accessibility consultant, believes that COGA must be supplemented with direct input from neurodivergent users during testing. Without thoughtful and direct collaboration with affected individuals, interactional expertise is not being valued and the opinions and language of technical experts are overpowering those of others.

Conclusion

While the WCAG is often praised as a collaborative international achievement of technical, accessibility, and policy experts, it remains far from perfect. Far too many focus on the issues of getting the guidelines into legislation not realizing crucial shortcomings within the working group and guidelines themselves. Its most glaring oversight is the disregard for interactional expertise displayed by the limited inclusion and consultative treatment of the very individuals it aims to support: disabled people themselves. Beyond the web, all engineers, designers, and creators should critically reflect on how they define "meaningful" expertise and recognize that valuable contributions come from those traditionally excluded from design conversations. True inclusion requires more than consultation—it demands collaboration and validation through active involvement in the design process.

Web accessibility has undoubtedly made significant strides since the early days of the internet, and the establishment of an international standard is an accomplishment many industries have yet to come close to. Its integration into Article II represents meaningful progress. Yet, to build a truly equitable digital world, more human-centered research must supplement these technical guidelines. Further investigation into why the WCAG has struggled to incorporate lived experiences and experimentation could illuminate a path forward. Accessibility online starts with accessibility in design, and without a culture that deems interactional experts as

anything more than consultants, an equitable internet cannot exist. As web accessibility efforts in policy continue to build momentum from the public sector to the private sector, a truly unified and inclusive standard must be ready when the moment comes.

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