Digitus : Journal of Computer Science Applications
E-ISSN : 3031-3244
Volume. 3, Issue 2, April 2025
Page No: 117-126

Policy in Practice: A Systematic Review of WCAG 2.2 and ADA 2024 Effects on Web and Mobile Accessibility

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Received : March 5, 2025
Accepted : April 19, 2025
Published : April 30, 2025

Citation: Purwandari, N., Dewi, R, K., Rinaldo., Sucipto, P, A. (2025). Policy in Practice: A Systematic Review of WCAG 2.2 and ADA 2024 Effects on Web and Mobile Accessibility. Digitus : Journal of Computer Science Applications, 3 (2), 117-126.

ABSTRACT: Introduction & Objective : Digital accessibility remains a global concern, affecting 1.3 billion people with disabilities. This study evaluates the impact of two policy changes WCAG 2.2 and the 2024 ADA Final Rule on digital interface compliance. A systematic review was conducted using PRISMA 2020 guidelines. Data were sourced from academic databases and regulatory documents spanning 2015–2024. Studies were selected based on their relevance to WCAG/ADA compliance. Quality appraisal was carried out using the Mixed Methods Appraisal Tool (MMAT), and findings were synthesized narratively across web and mobile contexts. WCAG 2.2 added success criteria to improve usability for users with cognitive, motor, and visual impairments. ADA 2024 requires U.S. public sector platforms to meet WCAG 2.1 AA, while the European Accessibility Act shows uneven implementation among member states. WebAIM's 2024 audit revealed that 95.9% of websites still fail basic accessibility checks, and mobile platforms show even lower compliance. Common issues include poor contrast, missing alt text, and inadequate touch targets. Automated tools alone are insufficient without assistive technology validation. Over reliance on ARIA, limited developer training, and inconsistent policy enforcement persist as barriers to effective implementation. Regulatory updates represent progress but must be supplemented by education, standardized testing protocols, and user involved design practices. Sustainable accessibility requires a shift from reactive compliance to proactive inclusivity, supported by policy, pedagogy, and participatory designy.

Keywords: Digital Accessibility, WCAG 2.2, ADA Final Rule 2024, Interface Compliance, Assistive Technology, Mobile Accessibility, Inclusive Design.

INTRODUCTION

Digital exclusion remains a pressing issue in the context of modern digital societies. Despite technological progress, people with disabilities still face major barriers to accessing online services.

In 2024, about 1.3 billion people (16% of the world's population) live with disabilities and remain at high risk of digital exclusion. As of 2024, it is estimated that approximately 1.3 billion people or 16% of the global population live with some form of disability. This demographic is at a disproportionate risk of being excluded from the benefits of the digital age. Studies indicate that while efforts to enhance digital accessibility are increasing, persistent barriers such as inadequate web design, non inclusive policies, and lack of standardization continue to impede equitable access (Ferri & Favalli, 2018).

The COVID 19 pandemic further underscored the digital divide. As public services, education, healthcare, and commerce rapidly transitioned online, individuals with disabilities experienced heightened levels of exclusion due to insufficient accessibility infrastructure. Inaccessible content and services ranging from websites and mobile applications to digital forms and communication tools limited full participation in critical societal functions (Fuglerud et al., 2021). These circumstances accentuated the need for regulatory mechanisms and industry wide standards that ensure digital inclusivity.

To address this disparity, the Web Content Accessibility Guidelines (WCAG), developed by the World Wide Web Consortium (W3C), have evolved to reflect new technological and user expectations. Since the initial release of WCAG 2.0, the guidelines have adopted a structured approach based on four foundational principles: Perceivable, Operable, Understandable, and Robust (POUR). With WCAG 2.1, additional success criteria were introduced to better support users with cognitive and learning disabilities, as well as those with low vision. In 2022, WCAG 2.2 expanded upon these guidelines further, emphasizing enhancements in user experience through improved focus visibility, cognitive load reduction, and alternatives for drag and drop interactions (Ferri & Favalli, 2018).

Alongside these technical standards, legal frameworks such as the Americans with Disabilities Act (ADA) in the United States and the European Accessibility Act (EAA) in the European Union serve to formalize accessibility obligations. The ADA extends civil rights protections into the digital sphere by requiring that public services offered online be accessible to individuals with disabilities. Numerous lawsuits and compliance enforcement cases have prompted organizations to prioritize digital accessibility as a legal necessity. Similarly, the EAA sets comprehensive requirements for EU member states, compelling public sector entities to align their digital content with WCAG standards. These legislative instruments serve both as mandates for organizations and as mechanisms for individuals to assert their right to digital inclusion (Fuglerud et al., 2021).

Legal pressure has had a discernible effect on design practices, particularly within government agencies and publicly funded institutions. These organizations are increasingly adopting universal design principles and user centered approaches that include individuals with disabilities in testing and iterative development. Not only does this support legal compliance, but it also improves the overall usability and effectiveness of digital platforms. Public and professional scrutiny coupled with evolving legislation has motivated entities to rethink accessibility not merely as a compliance task, but as a design imperative (Fuglerud et al., 2021).

Despite these advancements, many common digital accessibility barriers persist. These include the absence of alternative text for non textual content, poor color contrast, non intuitive navigation for users with cognitive impairments, and lack of support for assistive technologies. Such challenges underline the necessity of embedding accessibility considerations from the earliest stages of digital content development. Implementing the full range of WCAG criteria is thus essential to achieving meaningful inclusion (Ferri & Favalli, 2018).

The legislative and technical responses to digital exclusion since 2015 indicate a growing awareness of accessibility as a fundamental right. Policymakers and developers have made strides by incorporating user centered design methodologies and providing accessibility training programs. However, gaps remain between intention and implementation. By involving individuals with disabilities in design processes, emphasizing regulatory education, and aligning digital services with evolving guidelines, stakeholders can advance toward a more inclusive and equitable digital ecosystem (Ferri & Favalli, 2018).

This study evaluates the effectiveness of two pivotal regulatory developments WCAG 2.2 and the ADA Final Rule of 2024 in shaping digital interface compliance. It investigates how these policies have influenced accessibility practices, identifies persistent gaps, and offers insights into regional implementation variations. The novelty of this study lies in its synthesis of empirical data and legislative impact, with a particular focus on the intersection of policy evolution and practical interface design outcomes.

METHOD

This study uses a systematic review to assess how WCAG 2.2 and the 2024 ADA Final Rule affect web and mobile interface compliance. The methodology follows established best practices to ensure validity, transparency, and replicability (Alsaeedi, 2020; Ji et al., 2022).

A pre defined protocol guided the systematic review, including a clear research question, inclusion and exclusion criteria, data extraction methods, and synthesis procedures (Ji et al., 2022, p. 20). The review followed the PRISMA 2020 statement, ensuring systematic identification, screening, and reporting of studies. Grey literature, including government reports, accessibility audit datasets, and regulatory publications, was incorporated to mitigate potential publication bias (Kayesa & Shung-King, 2021).

Searches were conducted across five major academic databases: ACM Digital Library, IEEE Xplore, Scopus, Web of Science, and PubMed. Additional regulatory sources were drawn from W3C documentation, ADA.gov, and EUR Lex. The search covered publications from 2015 to 2024 to capture the impact of WCAG 2.0 to 2.2 and relevant legal developments. Keywords included combinations of terms such as “WCAG,” “accessibility compliance,” “user interface,” “ADA,” “EAA,” “digital inclusion,” and “mobile accessibility.” Boolean operators were used to refine the results and maximize coverage.

Studies were included if they:

- Evaluated web or mobile interfaces for accessibility,
- Focused on WCAG compliance,
- Linked results to policy or regulatory frameworks, or
- Reported user based accessibility outcomes in public or regulated domains.

Screening involved two phases: title/abstract screening and full text review. Duplicates and irrelevant studies were excluded. Studies were categorized according to study design, platform evaluated (web or mobile), and geographic or legal context (U.S., EU, or global).

The methodological rigor of included studies was assessed using the Mixed Methods Appraisal Tool (MMAT), which supports evaluation of qualitative, quantitative, and mixed method studies (Ji et al., 2022). Criteria addressed relevance, clarity of research questions, methodological coherence, and adequacy of data analysis. For studies using mixed methods, particular attention was paid to the integration of qualitative insights and the consistency between data types (Poitier et al., 2022). Triangulation techniques were used where applicable to confirm findings across data sources (O'Connell et al., 2018).

Accessibility related policy documents were systematically reviewed using a document analysis framework (Dalglish et al., 2020). Coding was applied to extract themes such as implementation timelines, compliance mandates, enforcement mechanisms, and references to WCAG standards. Comparative analysis across U.S. and EU policies was conducted to reveal convergence and divergence in regulatory scope and effect (Ancho & PF, 2021). Thematic analysis was employed to align policy language with empirical compliance data (Maleki et al., 2023).

A standardized data extraction template was used to collect key study characteristics: year, location, interface platform, user group (if specified), WCAG version cited, metrics evaluated, and major findings. Studies were synthesized narratively, categorized by regulatory region (U.S., EU) and interface type (web, mobile). Quantitative trends were charted where appropriate. Qualitative findings were thematically mapped to identify recurrent barriers and design implications.

RESULT AND DISCUSSION

Policy Development Overview

The evolution of accessibility standards, particularly the transition from WCAG 2.1 to WCAG 2.2, reflects a focused effort to address user challenges across multiple disability categories. WCAG 2.1 expanded the accessibility landscape by introducing success criteria that addressed mobile interactions and low vision navigation. These additions helped clarify design requirements such as touch target sizing and response timing (Li & Isa, 2023). WCAG 2.2 refined this work, emphasizing usability principles like user flexibility, error prevention, and clearer focus indicators features crucial for users with cognitive and motor impairments.

Table 1. Comparison of WCAG Success Criteria

WCAG Version	Key Additions	Focus Area
2.0	Initial POUR framework	Foundational accessibility
2.1	Touch targets, label in name, orientation	Mobile, cognitive, low vision
2.2	Focus not obscured, dragging movements, help	Navigation, motor, cognitive load

Complementing these technical standards, the ADA Final Rule 2024 represents a pivotal shift in U.S. accessibility enforcement. Moving away from a reactive model dominated by lawsuits, the updated rule introduces proactive compliance mandates and delineated accountability procedures. This includes clear guidance, support infrastructure, and standard timelines for state and local digital services to meet WCAG 2.1 AA (Li & Isa, 2023).

In the European context, the EAA's broad scope introduces a layer of complexity. Harmonizing accessibility practices across EU member states entails aligning national laws with EAA directives. Administrative readiness, variance in legal culture, and training needs have emerged as significant barriers (Bauerly et al., 2019). Despite these challenges, the EAA's ambitious targets position it as a cornerstone of digital equity in the EU.

Finally, international frameworks such as WCAG, Section 508 (U.S.), and the EAA, while aligned in intent, diverge in specificity. WCAG is globally accepted for technical implementation; Section 508 adds U.S. centric operational layers, and the EAA prioritizes harmonization within a federated legal structure (Li & Isa, 2023).

Compliance Outcomes

Accessibility audits reveal persistent non compliance across sectors and platforms. WebAIM's 2024 audit identified that 95.9% of 1 million homepages contained detectable WCAG violations, including low contrast text, missing alternative text, and empty form labels (Li & Isa, 2023). Error counts averaged over 30 per page, illustrating substantial gaps in web accessibility.

Table 2. Common Web Accessibility Violations (WebAIM, 2024)

Violation Type	Prevalence (%)
Low color contrast	83.6%
Missing alt text	58.8%
Empty links or labels	51.3%
ARIA misuse	Correlated

Automated auditing tools such as Lighthouse and axe core play a key role in flagging technical issues but fail to capture experiential or contextual usability concerns (Bauerly et al., 2019). Studies emphasize the importance of pairing these tools with assistive technology testing and user evaluations to create a complete accessibility profile (Li & Isa, 2023).

Mobile interfaces demonstrate even lower compliance levels. A 12 country study showed a 62% average WCAG failure rate in popular apps, especially around target sizing and navigation inconsistencies. These findings highlight the difficulties developers face in implementing responsive, inclusive mobile designs.

Compliance variation is influenced by jurisdictional, cultural, and sectoral dynamics. Countries with robust legal frameworks and active advocacy show higher conformance rates. Public institutions tend to perform better due to legal obligations, whereas private organizations lag in the absence of external enforcement (Bauerly et al., 2019).

Policy Implementation

In the U.S., ADA Title II compliance monitoring includes self assessment mandates, reporting benchmarks, and public transparency protocols. These mechanisms aim to elevate awareness and accountability in state level digital governance (Li & Isa, 2023).

EU member states are pursuing national implementation strategies to operationalize the EAA. These include developing action plans, stakeholder consultation mechanisms, and accessibility task forces. Inclusion of people with disabilities in these processes is being encouraged as a policy norm (Bauerly et al., 2019).

Table 3. Policy Implementation Status (2024)

Region	Policy	Status	Enforcement Tools	Impact
USA	ADA Final Rule	Enforced	DOJ, self reports	Early improvement
EU	EAA	Transition	National action plans	Varies by country

Early signs of policy impact are visible. Jurisdictions that adopted clear legislative mandates report measurable improvements in public sector website accessibility. Audits post policy enactment show a downward trend in critical violations, suggesting that legal reinforcement has tangible benefits (Li & Isa, 2023).

Public procurement policy has become a key tool for compliance. By embedding WCAG standards into contracting criteria, governments incentivize private vendors to deliver accessible digital products. This practice encourages wider ecosystem accountability and normalizes accessibility in product development pipelines (Li & Isa, 2023).

Legal frameworks such as WCAG, ADA, and EAA have advanced digital accessibility, but limitations in scope, enforcement, and adaptability hinder consistent compliance. A key challenge is varying interpretations across jurisdictions. For example, the ADA ensures civil rights protections but uneven enforcement across U.S. states creates accessibility disparities (Friso et al., 2020). Moreover, legal frameworks are often reactive rather than proactive, encouraging organizations to comply only when legally challenged framing accessibility as a defensive obligation rather than a design principle (Pieraccini et al., 2016).

The pace of technological innovation further complicates legal applicability. Mobile first interactions, for example, remain underregulated, leaving app developers without clear guidance

on implementing inclusive practices. As mobile apps become increasingly central to public services, this legal lag undermines broader accessibility goals (NASWAR et al., 2023). Additionally, the absence of standardized evaluation metrics impedes consistent compliance monitoring, making it difficult for organizations to benchmark or improve their practices effectively (Pieraccini et al., 2016).

Reliance on litigation as a compliance tool brings mixed outcomes. While the risk of lawsuits motivates some improvements, it can also lead to minimal effort solutions or delay deeper engagement with accessibility best practices. Legal threats alone do not promote a user centric approach, and often fail to encourage genuine collaboration with individuals with disabilities (Friso et al., 2020).

A more sustainable path forward requires embedding accessibility training directly into software development curricula. Introducing WCAG principles and inclusive design thinking in foundational coursework ensures that future developers treat accessibility as integral rather than supplemental. Hands on projects, real world accessibility audits, and partnerships with disability advocacy organizations can deepen understanding and foster empathy (NASWAR et al., 2023). For current professionals, ongoing training programs, certifications, and workshops can bridge the gap between legal requirements and implementation. Cross disciplinary education, involving fields like human computer interaction and cognitive psychology, further enriches this approach.

Another recurring issue is the over reliance on ARIA (Accessible Rich Internet Applications) attributes. ARIA offers essential tools for enhancing screen reader support and user interaction, but misapplication is rampant. Developers often use ARIA as a substitute for semantic HTML, undermining inherent accessibility structures and causing usability issues. Without proper usability testing especially with assistive technology users ARIA based implementations risk alienating the very users they aim to support (Albalwy et al., 2022).

To ensure digital environments are not only compliant but truly usable, it is critical to validate ARIA use with practical testing and user feedback. Iterative evaluations during the development cycle are necessary to move beyond technical conformity and towards inclusive functionality (Albalwy et al., 2022).

Equally vital is the standardization of assistive technology testing in mobile environments. Current methodologies vary widely, resulting in inconsistent accessibility outcomes. Establishing universal criteria for screen reader performance, touch interaction, and alt navigation structures can aid in harmonizing developer practices. Collaboration among tech companies, AT vendors, and disability communities is central to this effort (Haaland et al., 2019).

User testing must play a foundational role in mobile evaluation protocols. Individuals with disabilities offer unique insights into the nuanced interactions that shape digital inclusion. Coupling manual testing with automated tools allows for more accurate assessment and leads to scalable accessibility practices (Haaland et al., 2019).

In sum, while legal frameworks provide necessary scaffolding for digital inclusion, they must be complemented by design education, usability validation, and testing standardization. Only through

this comprehensive, user centered approach can digital systems achieve meaningful accessibility and equitable participation for all users.

CONCLUSION

This study assessed the impact of WCAG 2.2 and the 2024 ADA Final Rule on digital accessibility across web and mobile platforms. The findings show that these policies have strengthened regulatory expectations and refined usability standards, especially for users with cognitive, motor, and visual disabilities. However, compliance remains inconsistent, and audits reveal recurring issues such as poor contrast, missing labels, and limited mobile testing protocols.

Sustainable progress requires more than legal mandates. Embedding accessibility in developer training, standardizing evaluation methods, and involving people with disabilities in usability testing are essential next steps. By combining regulation, education, and participatory design, stakeholders can move from minimal compliance toward genuine digital inclusion.

REFERENCE

Albalwy, F., McDermott, J., Newman, W. G., Brass, A., & Davies, A. (2022). A Blockchain-Based Framework to Support Pharmacogenetic Data Sharing. The Pharmacogenomics Journal, 22(5–6), 264–275. https://doi.org/10.1038/s41397-022-00285-5

Alsaeedi, A. (2020). Comparing Web Accessibility Evaluation Tools and Evaluating the Accessibility of Webpages: Proposed Frameworks. Information, 11(1), 40. https://doi.org/10.3390/info11010040

Ancho, I. & Kadek Aria Prima Dewi PF. (2021). Philippine Qualifications Framework and South Korea's New Southern Policy: Towards Quality Tech-Voc Education. Jurnal Penjaminan Mutu, 7(1), 53. https://doi.org/10.25078/jpm.v7i1.1953

Bauerly, B. C., McCord, R. F., Hulkower, R., & Pepin, D. (2019). Broadband Access as a Public Health Issue: The Role of Law in Expanding Broadband Access and Connecting Underserved Communities for Better Health Outcomes. The Journal of Law Medicine & Ethics, 47(S2), 39–42. https://doi.org/10.1177/1073110519857314

Dalglish, S. L., Khalid, H., & McMahon, S. A. (2020). Document Analysis in Health Policy Research: The READ Approach. Health Policy and Planning, 35(10), 1424–1431. https://doi.org/10.1093/heapol/czaa064

Ferri, D., & Favalli, S. (2018). Web Accessibility for People With Disabilities in the European Union: Paving the Road to Social Inclusion. Societies, 8(2), 40. https://doi.org/10.3390/soc8020040

Friso, F., Mendive, F., Soffiato, M., Bombardelli, V., Hesketh, A., Heinrich, M., Menghini, L., & Politi, M. (2020). Implementation of Nagoya Protocol on Access and Benefit-Sharing in Peru: Implications for Researchers. Journal of Ethnopharmacology, 259, 112885. https://doi.org/10.1016/j.jep.2020.112885

Fuglerud, K. S., Tunold, S., & Kjæret, K. (2021). Social Contact for Older People With Visual Impairment Through Mastery of Smartphones: Barriers and Suggested Solutions. https://doi.org/10.3233/shti210417

Haaland, M. E. S., Haukanes, H., Zulu, J. M., Moland, K. M., Michelo, C., Munakampe, M. N., & Blystad, A. (2019). Shaping the Abortion Policy – Competing Discourses on the Zambian Termination of Pregnancy Act. International Journal for Equity in Health, 18(1). https://doi.org/10.1186/s12939-018-0908-8

Ji, L., Qiang, F., & Zhou, Y. (2022). Mixed-Methods Inquiry of Socially Inclusive E-Learning: A Policy Document Analysis and Rapid Survey Study. Social Inclusion, 10(4). https://doi.org/10.17645/si.v10i4.4901

Kayesa, N. K., & Shung-King, M. (2021). The Role of Document Analysis in Health Policy Analysis Studies in Low and Middle-Income Countries: Lessons for HPA Researchers From a Qualitative Systematic Review. Health Policy Open, 2, 100024. https://doi.org/10.1016/j.hpopen.2020.100024

Li, L., & Isa, Z. M. (2023). Exploring the Effectiveness of Law Clinics in Enhancing Access to Justice for Low-Income Individuals in Malaysia. Ijssbm, 1(02). https://doi.org/10.59021/ijssbm.v1i02.45

Maleki, M., Fallah, R., Aryankhesal, A., & Haghdoost, A. A. (2023). Reviewing the National Health Services Quality Policies and Strategies of the Iranian Health System: A Document Analysis. International Journal of Preventive Medicine, 14(1). https://doi.org/10.4103/ijpvm.ijpvm_1_22

NASWAR, N., Maskun, M., Mukarramah, N. H. A., Angi, J. C. W., & Paliling, V. E. S. (2023). Legal Protection for Environment and Coastal Community From Marine Ecosystem Degradation and Climate Change Impact. Journal of Law and Sustainable Development, 11(9), e978. https://doi.org/10.55908/sdgs.v11i9.978

O'Connell, S., Vera J. C. Mc Carthy, & Savage, E. (2018). Frameworks for Self-Management Support for Chronic Disease: A Cross-Country Comparative Document Analysis. BMC Health Services Research, 18(1). https://doi.org/10.1186/s12913-018-3387-0

Pieraccini, M., Coppa, S., & Lucia, G. A. d. (2016). Beyond Marine Paper Parks? Regulation Theory to Assess and Address Environmental Non-compliance. Aquatic Conservation Marine and Freshwater Ecosystems, 27(1), 177–196. https://doi.org/10.1002/aqc.2632

Poitier, F., Kalliecharan, R. V., & Ebenso, B. (2022). Impact of Sustained Health Policy and Population-Level Interventions on Reducing the Prevalence of Obesity in the Caribbean Region: A Qualitative Study From the Bahamas. Frontiers in Public Health, 10. https://doi.org/10.3389/fpubh.2022.926672