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Examining the Relationship Between Legislation and Web Accessibility Compliance: From Theory to Practice

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ABSTRACT

This study examines the relationship between legal frameworks and web accessibility compliance across e-commerce platforms in the United States, United Kingdom, Canada, Australia, and South Africa. Using a mixed-methods design, 56 websites were evaluated against WCAG 2.0 and 2.1 Level AA standards, focusing on visual, auditory, operational, and content-related barriers. In parallel, national legal systems were analyzed using six variables: subject matter, definition, clarity, exemptions, penalties, and reporting. The findings underscore the role of accessible technologies in reducing barriers for people with disabilities and frame digital exclusion as a product of broader structural and systemic inequalities. Although WCAG is widely referenced, substantial implementation gaps persist, particularly in commercial contexts where legal requirements are ambiguous or weakly enforced. While structural and navigational accessibility showed relative strength, major disparities emerged in regulatory clarity, with the United States and United Kingdom leading and South Africa trailing, especially in large commercial e-commerce environments.

KEYWORDS

Web accessibility; legislation; e-commerce

1. Introduction

What motivates companies to implement web accessibility for the disabled? We may like to think it is pure social conscience and a desire for inclusivity. Some of us may assume it is cynically motivated by profits and increasing the customer base. It may be that fear of prosecution under legislations requiring accessible sites is what drives implementation. Or a desire for displaying the most advanced technologies and interfaces.

This study focuses on web accessibility legislation due to its central role in enforcing digital inclusion. Unlike voluntary efforts, legal frameworks establish binding obligations, define standards, and introduce enforcement mechanisms that can compel organizations to comply with accessibility requirements (Dobransky & Hargittai, 2016; Hosking, 2008). By examining and comparing national laws, this research seeks to understand how differences in legal clarity, scope, and enforcement influence actual accessibility outcomes (Gov UK, 2024; US DOJ, 2024). This approach provides a necessary perspective on the structural conditions that enable or hinder the implementation of accessible web design across countries (Ferri & Favalli, 2018; Lewis, 2021).

Recent studies in technical fields have underscored the critical importance of web accessibility for individuals with disabilities, highlighting the development of various evaluation tools and methodologies (Acosta-Vargas et al., 2018). Despite this increasing recognition, research remains insufficient in addressing the accessibility of commercial services (Noh et al., 2015), particularly in relation to legislation concerning the rights of people with disabilities (Meral & Turnbull, 2016).

The research's primary objective is to investigate the correlation between the degree of web accessibility and the passage of web accessibility legislation in recent years in the United States, United

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Kingdom, Canada, Australia, and South Africa, based on the data from top e-commerce corporations in these countries and their web accessibility laws.

These websites were assessed based on Web Content Accessibility Guidelines (WCAG) level AA criteria – which was adopted as the local standard, in these countries. Additionally, we examine how each country's web accessibility laws, such as the Americans with Disabilities Act in the USA and the Equality Act in the UK (Fichtner & Strader, 2024; Gov UK, 2024), influence website compliance. Our analysis shows significant differences between the local top-leading commercial corporation websites, with notable correlations between the stringency and enforcement of national accessibility laws and the overall accessibility of e-commerce platforms.

This study adopts a "from theory to practice" perspective on web accessibility by integrating insights from Disability Studies with a comparative analysis of law and implementation. It conceptualizes web accessibility not merely as a technical feature or a voluntary organizational decision, but as a structural outcome shaped by how accessibility obligations are defined and enforced in law. Methodologically, the study combines website accessibility assessments based on WCAG with an examination of national accessibility legislation, focusing on how clearly accessibility duties are articulated, how broadly they apply, what exceptions are allowed, and whether effective enforcement mechanisms—such as penalties and reporting requirements—are in place. Empirically, the study examines whether differences in the design and enforceability of legal frameworks are reflected in observable accessibility outcomes in commercial websites across multiple national contexts. From a policy and practice perspective, the findings highlight the importance of clear and enforceable regulation in translating formal disability rights into accessible digital services within the business sector.

This paper begins with a theoretical and legal background on disability, web accessibility, and digital regulation. It then presents the research design and mixed-methods methodology used to evaluate e-commerce websites and national accessibility legislation. The results of the website assessment and the comparative legal analysis are subsequently reported, followed by a discussion of their implications and the paper's conclusions.

2. Background

2.1. Disabled society?

The Social Model of Disability Shifts focus from individual impairments to the ways society creates disabling environments. While the medical model of disability views a person's physical or cognitive differences as the primary issue, the social model argues that disability arises from external barriers—such as inaccessible infrastructure, discriminatory attitudes, and exclusionary policies (Morris, 2001). The goal of this approach is not to "fix" the individual, but to "fix" the environment to make it more inclusive for everyone (Oliver & Barnes, 2010).

In the context of new technology, it has the potential to either reinforce existing inequities or disrupt them by reconfiguring how individuals interact with their environment (Goggin & Newell, 2005). When technologies are developed with consideration for diverse needs, they can act as tools for dismantling societal barriers, fostering greater inclusion and accessibility (van Deursen & van Dijk, 2019). Conversely, if these systems fail to account for varying user experiences, they risk perpetuating exclusion (Duman et al., 2016).

Furthermore, critical disability theory adopts a version of the social model based on the principles: disability is a social construct, not the inevitable consequence of impairment; disability is characterized as a complex interrelationship between impairment, individual response to impairment, and the social environment; the social disadvantage experienced by disabled people is caused by the physical, institutional, and attitudinal barriers operating together (Hosking, 2008). Consequently, the social environment fails to meet the needs of people who do not match the social expectation of normalcy and (Adam & Kreps, 2006), that keeps the systematic discrimination and power in the society (Hosking, 2008).

2.2. The role of business in society

The structural framework of information technology highlights how new communication technologies, like the internet, drive social change by being easy to adopt and enabling broader control by businesses (Scherer et al., 2019). The internet's widespread use has transformed communication and society, introducing new challenges. Its infrastructure is increasingly controlled by commercial corporations, similar to essential services like electricity and roads (Schroeder, 2018). This shift has democratized access, particularly for people with disabilities, providing them with opportunities previously out of reach and promoting their societal inclusion (Newell, 2004). Evaluating e-commerce websites for accessibility is essential for ensuring these benefits extend to everyone, improving society.

2.3. Institutional digital accessibility framework

The participation of people with disabilities in the digital environment is shaped by the interaction between technological design, social structures, and institutional incentives. While digital technologies can reduce barriers, they may also reproduce exclusion when accessibility is treated as optional rather than integral to design (Ellcessor, 2016; Goggin & Newell, 2005). From the Disability Studies perspective, digital exclusion is understood as a consequence of inaccessible environments rather than individual impairments, positioning websites as social spaces that can either enable or restrict participation (Morris, 2001; Oliver & Barnes, 2010).

At the organizational level, the implementation of web accessibility is influenced not only by technical feasibility or ethical intent, but also by motivation and expected outcomes. Expectancy-based motivation theories suggest that organizations are more likely to invest in accessibility when they perceive clear incentives or consequences associated with their actions (Sycheva et al., 2019). In the context of web accessibility, such expectations are shaped by broader regulatory environments that signal whether accessibility is a voluntary aspiration or a binding obligation.

Within this integrated framework, the two theories serve complementary analytical functions. Disability Studies provide the conceptual lens for interpreting observed accessibility barriers as structurally produced features of digital environments rather than individual limitations. Expectancy-based motivation theory, in turn, explains why variations in regulatory expectations, clarity, and enforcement are likely to shape organizational decisions regarding accessibility implementation. Together, these perspectives inform the formulation of the research questions and hypotheses and guide the interpretation of the empirical findings as evidence of how national regulatory contexts influence accessibility practices in commercial websites.

2.4. Who is a person with a disability?

For the purpose of measurement and comparison, this study includes commonly used functional definitions of disability alongside its conceptual framework. These definitions enable the identification of individuals experiencing limitations in vision, hearing, mobility, or cognition, and support consistent classification across datasets. Their inclusion ensures clarity in the scope of analysis without undermining the broader understanding of disability as shaped by environmental and societal barriers.

A person with a disability is someone who has significant difficulty in his ability to function in daily life activities as well as participate in routine activities in general. They are individuals with a physical, mental or intellectual disability including cognitive, permanent or temporary impairment (Adam & Kreps, 2006), which materially limits their functioning in one or more of the major areas of life (Wolbring, 2011).

In Europe, it is estimated that about 15% of the population employed in the workplace are persons with disabilities (Bonaccio et al., 2020), while in the US, 25.7% of all adults are people with disabilities (Zhao et al., 2019).

Many people with disabilities rely on assistive technologies—such as screen readers, screen magnifiers, alternative input devices, and captioning systems—to access digital content (Aleksandrova & Nenakhova, 2019; Jaeger, 2011). The effectiveness of these technologies depends on websites being

designed with appropriate semantic structure, operability, and technical compatibility, enabling assistive systems to correctly interpret and convey content (Ellcessor, 2016; Goggin & Newell, 2005). When digital environments are not built to support assistive technologies, accessibility barriers emerge through design choices rather than individual impairments, reinforcing digital exclusion and limiting equal participation online (Dobransky & Hargittai, 2016; Morris, 2001; Oliver & Barnes, 2010).

2.5. Doctrinal basis of web accessibility

Recent case law has clarified web accessibility obligations through complementary judicial approaches that assess websites both as service environments and as technical systems whose design can independently produce exclusion. Together, these strands establish that discrimination may arise from how a website functions in practice as well as from the role it plays in mediating access to services (Ferri & Favalli, 2018; Heyer, 2007).

In the United States, Robles v. Domino's Pizza (2019), treated a website and mobile application as gateways to a company's services, reasoning that digital barriers preventing disabled users from ordering food are functionally equivalent to barriers at a physical service point. The doctrinal significance lies in the analogy: when a website mediates access to goods and services, inaccessibility constitutes unequal access to the service itself.

A complementary focus on technical accessibility appears in Gil v. Winn-Dixie Stores and Inc. (2021). There, the court examined the website's incompatibility with screen readers and its failure to support effective navigation, locating discrimination in concrete design choices that prevented blind users from completing online tasks. The claim was grounded in demonstrable technical barriers embedded in the website's implementation, rather than in abstract equivalence alone (Lazar, 2022).

A similar emphasis on the effects of digital design appears in the United Kingdom. In R (Rowley) v Minister for the Cabinet Office (2021), the court held that inaccessible digital communication constituted unequal access, focusing on how information was delivered online and its practical usability for disabled users. The doctrinal point was that when digital channels are used to provide services or information, their accessibility must be assessed in terms of actual user access (Gov UK, 2024).

Taken together, these decisions establish a clear doctrinal position: web accessibility obligations arise both because websites function as service environments and because technical design choices can directly exclude users. This convergence explains the reliance on a shared technical benchmark for evaluating accessibility in practice, a role increasingly fulfilled by the Web Content Accessibility Guidelines (WCAG), discussed in the following section.

2.5.1. Web Content Accessibility Guidelines document

WCAG 2.0 (W3C, 2008) is a World Wide Web Consortium (W3C) document covering various types of internet consumer platforms. Its guiding principle is the adaptation of existing situations to people with disabilities without harming those who do not have disabilities. Some of its requirements are subject to automated review; others only by human evaluation (Noh et al., 2015).

The document deals with the accessibility of a site's visual, auditory, operational, and content components that should be adapted for use by people with sensory impairments (sight, hearing and touch), cognitive deficiencies (reading and learning), and motor skill problems (hand operation, epilepsy) or any combination of these. It divides accessibility requirements into three levels – A, AA and AAA (from basic to complex), each including the requirements below it. Most website accessibility requirements exist at level A (W3C, 2008).

2.6. Legal requirements

The United States, United Kingdom, Canada, Australia, and South Africa all mandate digital accessibility to promote inclusivity for individuals with disabilities, aligning with WCAG (W3C, 2018). In the U.S., Section 508 of the Rehabilitation Act and the Americans with Disabilities Act (ADA) require equal access to electronic information, with recent DOJ rules enforcing WCAG 2.1 Level AA compliance for state and local governments (Fichtner & Strader, 2024; US DOJ, 2024). The UK's Equality Act

2010 and Accessibility Regulations 2018 obligate public and business sectors to meet WCAG 2.1 standards, with noncompliance deemed discriminatory (Gov UK, 2024). Canada's Accessible Canada Act (2019) and provincial laws like Accessibility for Ontarians with Disabilities Act (AODA), enforce WCAG 2.0 or higher, targeting a barrier-free nation by 2040 (Henderson, 2024; Hosting Canada, 2024). Australia's Disability Discrimination Act 1992 and National Transition Strategy require WCAG 2.0 Level AA for public services (AU CFA, 2024; Gov.AU, 2020). South Africa's Equality Act (2000) and related digital policy frameworks reference accessibility obligations aligned with WCAG 2.1 Level AA, though enforcement mechanisms remain comparatively limited (SA Gov, 2021). Therefore, the most updated regulation for Web Accessibility will be examined in this research. Where national regulations explicitly reference WCAG 2.0, alignment was assessed in light of WCAG 2.1 Level AA as the prevailing international benchmark at the time of analysis.

2.7. Evaluating web accessibility

Ismailova and Inal tested the websites of the top universities in Kyrgyzstan, Kazakhstan, Azerbaijan and Turkey using automated assessment tools. They showed that university websites are more popular in Turkey, and in Turkish universities, developers pay more attention to performance, followed by the Azerbaijani, Kyrgyz and Kazakh universities. Many of the university websites in the study did not meet the WCAG 2.0 accessibility criteria. Only a few of Kyrgyz and Kazakh university websites reached level A conformance, and even fewer achieved level AAA accessibility conformance (Ismailova & Inal, 2018). The present study compares the accessibility level of e-commerce websites from United States, United Kingdom, Canada, Australia and South Africa, in compliance to WCAG 2.0 level AA with some updates from version 2.1.

Krawiec and Dudycz focused on automatic accessibility verification of web pages. They rated the capabilities and ease-of-use of most tools available for accessibility testing, some of which are free and others that charge a fee. The advantage of automated tools is the ability to verify quickly all pages on the site. These tools differ in terms of their scope of verification; therefore, studies have proposed criteria for rating these tools' technical capabilities. Nevertheless, these tools do not enable evaluation in accordance with all web page accessibility criteria so that manual testing by experts or users is necessary (Krawiec & Dudycz, 2017). Thus, the present study employed a few automated tools – each with advantages – along with manual inspection of site components that cannot be inspected automatically.

One method used by Lorca et al. to rate European banks' website accessibility was the Web Accessibility Barriers (WAB) metric – a form that rates websites' accessibility according to WCAG 1.0 criteria (Lorca et al., 2012). Errors are rated on a scale of 0 (no accessibility barriers) to 5 (most of the site components are inaccessible) according to a frequency percentage on the site. Completing the form requires manual and automated review (de Andrés et al., 2009).

The present study uses a newer rating form – similar to the WAB metric – and based on sections of WCAG 2.0, Accessibility Barrier Scores (ABS) (Hudson, 2011) it contains six main features that reflects the structure of websites: Image and color, Structure and navigation, Video and audio, Forms, Data tables and Understandability. We use it to reliably test quantitatively the accessibility of retail corporations' websites.

2.8. Comparing legal requirements

Meral and Turnbull (2016) analyzes Turkey's disability policy, comparing it to the United Nations Convention on the Rights of Persons with Disabilities (CRPD) and U.S standards. While Turkey's laws align with the CRPD, implementation gaps persist. The analysis utilizes Social Model and Critical Theory to examine the impact of web accessibility regulations on businesses, as we have mentioned above. Therefore, the authors recommend legislative improvements, accessibility standards, and active participation of persons with disabilities in decision-making (Meral & Turnbull, 2016).

Bratan et al. (2020) examines the implementation of the CRPD in Germany, Hungary, Portugal, and Sweden, focusing on policy alignment, practical application, and accessibility of assistive technologies. It compares the effectiveness of policies in education, employment, independent living, and public spaces. Sweden and Germany were found to provide better support for assistive technologies and inclusivity,

while Hungary and Portugal face limitations. The study recommends standardized indicators, adopting successful policies, and expanding NGO involvement to improve inclusivity across Europe (Bratan et al., 2020).

2.9. Assessing legal requirements

Majambere (2011) emphasizes that the effectiveness of a legal framework depends on how well its provisions are articulated and structured. This ensures laws are not only enforceable but also accessible to diverse stakeholders, including governments, organizations, and individuals with disabilities. Similarly, (Levin, 2018) highlight the importance of integrating reporting and penalties into legislation to promote accountability and compliance (Gunningham, 1987).

Hence, six variable subject matter, definition, clarity, exemptions, penalties, and reporting—are selected to evaluate the efficacy and predictability of web accessibility laws, providing an interconnected framework for cross-jurisdictional analysis.

- The subject matter examines the comprehensiveness of the law. Does the law encompass key areas such as websites, mobile applications, software, and other digital tools? Comprehensive coverage ensures that legal frameworks address emerging technological contexts (Porter, 2013). The Americans with Disabilities Act (ADA) initially focused on physical spaces but has been interpreted to cover digital environments. However, this may lead to inconsistent interpretations (US DOJ, 2024).
- Definitions are critical for reducing ambiguity in legal texts. Terms like "accessibility," "disability," or "compliance" need to be precise, reflecting international standards like WCAG (Whalen, 2022). The European Union's Web Accessibility Directive (2016) explicitly references WCAG 2.1, offering a clear benchmark for compliance (EU Union, 2021).
- Clarity ensures that the language of the law is straightforward, making it easier to implement and enforce. Ambiguous legal texts can lead to confusion and inconsistent application (Majambere, 2011). Notably, Accessible Canada Act (ACA) includes simple language and step-by-step compliance guidelines, which facilitate implementation by organizations (Hosting Canada, 2024).
- Exemptions assess whether laws provide reasonable accommodation for cases where compliance may be excessively burdensome. Overbroad or vague exemptions, however, can weaken a law's effectiveness (Whalen, 2022). Australia's Disability Discrimination Act (DDA) allows for "unjustifiable hardship" exemptions (AU Gov, 2025).
- Penalties evaluate the strength of enforcement mechanisms. Laws with clearly defined consequences for noncompliance are more likely to be effective (Levin, 2018). The UK's Equality Act relies on individuals bringing private claims, which limits its enforcement capacity (Gov UK, 2024).
- Reporting assesses whether laws require regular documentation or public disclosure of web accessibility compliance (Eusébio et al., 2023; Yu, 2002). Under Section 508 in the U.S., federal agencies must submit annual reports detailing audits and actions to address accessibility gaps (Fichtner & Strader, 2024; GSA US, 2024).

3. Research design

This study examines the relationship between legal frameworks and web accessibility in commercial websites for individuals with disabilities, focusing on how regulatory environments shape accessibility implementation. Website accessibility data were collected from leading e-commerce platforms in the United States, United Kingdom, Canada, Australia, and South Africa between December 2020 and April 2021, during a period of intensified reliance on digital services. The legal analysis draws on the most recent versions of national accessibility regulations available at the time of analysis (2024). This temporal separation is justified by the fact that web accessibility legislation in these jurisdictions develops gradually and builds on established legal obligations, allowing the regulatory context to be treated as a stable institutional reference for the analysis.

The research employs a mixed-methods approach (Krawiec & Dudycz, 2017) conforming of Images and Color, Structure and Navigation, Video and Audio, Forms, Data Tables and Understandability to WCAG

Level AA criteria (W3C, 2008, W3C., 2018). Additionally, a quantitative analysis conducted from June to August 2024 evaluates the comprehensiveness, clarity, penalties, and reporting requirements of web accessibility laws in the same countries (Levin, 2018; Majambere, 2011), providing a comparative assessment of their effectiveness in promoting accessible digital environments across diverse socio-demographic contexts.

3.1. Research questions and hypothesis

RQ1: To what extent does the strength of a country's web accessibility regulations in United States, United Kingdom, Canada, Australia and South Africa influence the overall level of website accessibility?

H1: Countries with stronger and more effectively enforced web accessibility regulations, as measured by factors such as clarity of definitions, scope of coverage, severity of penalties, and the existence of robust reporting mechanisms (Bratan et al., 2020; Meral & Turnbull, 2016), will exhibit higher levels of website accessibility, as assessed by WCAG criteria (Ismailova & Inal, 2018).

RQ1.1: Which national regulatory context (United States, United Kingdom, Canada, Australia, South Africa) is associated with higher levels of web accessibility for people with disabilities?

H1.1: Despite the formal adoption of WCAG as a common accessibility standard across the United States, the United Kingdom, Canada, Australia, and South Africa (Gov.AU, 2020; Gov UK, 2024; Hosting Canada, 2024; SA Gov, 2021; US DOJ, 2024), differences in the clarity, scope, and enforcement of national accessibility regulations will result in systematic cross-national variation in accessibility outcomes among commercial websites (Yang & Chen, 2015).

RQ1.2: To what extent do the web accessibility regulations in the United States, United Kingdom, Canada, Australia, and South Africa promote digital accessibility for people with disabilities?

H1.2: Countries with web accessibility regulations that are more comprehensive, clearly defined, and strictly enforced—particularly those aligning with international standards (Levin, 2018; Majambere, 2011)—will exhibit higher levels of compliance with web accessibility requirements among e-commerce websites (Dobransky & Hargittai, 2016).

3.2. Methodology

A. The web accessibility evaluation of e-commerce websites was conducted using WCAG 2.0 with some updates from 2.1 (W3C, 2008, 2018), focusing on visual, auditory, operational, and content accessibility barriers (Goggin & Newell, 2005). A standard online shopping process was simulated, and websites were rated on a 0 (inaccessible) – 10 (totally accessible) scale using a customized checklist based on WCAG AA standards, adapted from the ABS document (Hudson, 2011), covering six key areas: Images and Color, Structure and Navigation, Video and Audio, Forms, Data Tables, and Understandability (Appendix A; H1.1). Automated tools were used to assess measurable criteria, while manual testing addressed elements requiring human judgment, such as multimedia content and complex information comprehension (Krawiec & Dudycz, 2017). To ensure reliability, an additional sample test of five websites (10% of the total) was reviewed by a second coder (Lorca et al., 2012).

B. An assessment of the effectiveness of web accessibility laws was conducted by two independent coders- one a law student with expertise in information systems and experience at the Equal Rights Authority in Israel, and the other a law student who founded a legal clinic for people with disabilities, provided diverse and critical perspectives in evaluating the web accessibility (Bratan et al., 2020; Meral & Turnbull, 2016). Focusing on Subject Matter, Definition, Clarity, Exemptions, Penalties, and Reporting (H1.2). Each criterion was rated on a 0 to 10 scale, with higher scores indicating a more effective legal framework. The coders analyzed the clarity and alignment of the laws' definitions of web accessibility with recognized standards like WCAG, as well as the impact of exemptions (e.g., for small businesses), strong penalties for noncompliance, and robust reporting

mechanisms on accountability and transparency (Levin, 2018; Majambere, 2011; Yang & Chen, 2015). To ensure consistency and reliability, coders were provided with legal texts, WCAG documentation, prior research, and detailed rubric. This methodology emphasized the importance of precise definitions, clear requirements, and accountability mechanisms in advancing equitable outcomes for individuals with disabilities (Bratan et al., 2020; Cohen, 1960; Meral & Turnbull, 2016; Viera & Garrett, 2005).

3.3. The data

A. 56 websites were inspected: 14 from the United States, 12 from United Kingdom, 12 from Canada, 10 from Australia and eight from South Africa. Although, these are not a representative sample of retailers in the evaluated countries, they were selected as the top e-commerce websites of retail corporations in each country, according to the size of the local market. The focus was on selecting local corporations with a corporate social responsibility policy and many employees. Some of the companies selected in South Africa are not independent local businesses. They are owned by international corporations but hold local brands. To provide a cross-sectional view of business norms in a defined consumer sector (Beschorner & Hajduk, 2017; Leitner & Strauss, 2010), the common sample size for academic research dealing with web accessibility was used (Sohaib & Kang, 2017). The corporations included, for example, Wal-Mart from the United States, Tesco from United Kingdom, Sobeys from Canada, Woolworths from Australia and Pick n Pay from South Africa. These are the leading retail corporations in the countries in question (BusinessTech, 2019; Grocery, 2018; NRF, 2019; Retail Council of Canada, 2019; Retail Economics, 2019).
B. The examination includes accessibility laws from five countries—USA, UK, Canada, Australia, and South Africa—each selected for its unique approach to legislating digital accessibility in public and private sectors (AU Gov, 2025; CA DOJ, 2023; Gov UK, 2024; SA Gov, 2020; US ADA, n.d.) countries were chosen because of their diverse legal frameworks, which range from comprehensive national policies, like the USA's Section 508 and ADA, to regional regulations, as seen in Canada's Accessible Canada Act (ACA) and provincial laws (H1.2).
C. By evaluating websites against accessibility criteria and comparing them with each country's legal standards, the approach seeks to identify how legislation influences accessibility compliance (H1).

4. Limitations

The analysis is subject to several methodological limitations. First, regarding the website evaluations, automated accessibility testing tools evolve over time and may yield different results across versions; this limitation was mitigated by combining multiple tools with structured manual inspections anchored in WCAG 2.0/2.1 Level AA. In addition, the assessments reflect a cross-sectional snapshot of accessibility at the time of data collection and do not capture subsequent design changes. Second, regarding the legal analysis, the coding relies on statutory texts and official regulatory guidance; although conducted independently by trained coders using a predefined rubric to ensure reliability, it cannot fully capture variation in judicial interpretation or enforcement practices. Finally, considering both components together, the focus on leading e-commerce platforms reflects dominant market norms but limits generalization to smaller or less visible commercial websites.

5. Findings

5.1. Web accessibility evaluation

The website analyses were conducted using one-way ANOVA to determine the variances between and/or in each of the selected countries (H1.1), by the categories listed in the checklist form, i.e., Images and Color, Structure and Navigation, Video and Audio, Forms, Data Tables and Understandability. In addition, to identify the variations between the categories comprising a website, one-way repeated measures ANOVA was conducted.

5.1.1. Reliability analysis of the website evaluations

To test the reliability of the e-commerce websites, five sites were randomly chosen – one from each country. These five websites were analyzed by two different coders according to all the criteria listed on the checklist form (Appendix A). One coder tested the entire sample of websites, and the second tested only these five websites. They worked according to the same criteria and the same tools.

The Pearson correlation rank shows a correlation of $r\ (135) = 0.94$, $p < 0.001$, which indicates a very high reliability among judges.

To see whether there is a difference between the five countries in the characteristics of their e-commerce websites, six one-way ANOVAs were conducted. The independent variable was the country (United States, United Kingdom, Canada, Australia and South Africa) and the dependent variables were the characteristics of websites: Images and Color, Structure and Navigation, Video and Audio, Forms, Data Tables and Understandability (H1.1).

No significant difference between countries regarding Images and Color, $F\ (4,51) = 0.61$, $p = 0.660$; Structure and Navigation, $F\ (4,51) = 0.91$, $p = 0.465$, Video and Audio, $F\ (3,\ 3) = 1.95$, $p = 0.299$; Forms, $F\ (4,46) = 1.59$, $p = 0.192$; Data Tables, $F\ (4,20) = 0.68$, $p = 0.612$; or Understandable, $F\ (4,\ 51) = 0.52$, $p = 0.720$ were found. The following Table 1 summarizes the mean accessibility scores for e-commerce websites across the five countries.

Even though the websites were relatively similar in their characteristics, we sought to explore the differences that did emerge. For the analysis. only four characteristics out of the six were chosen (the

Table 1. Mean accessibility scores by country and website characteristic.

Characteristic	Country	*N*	Mean	SD
Images & color	United States	14	6.32	1.04
	United Kingdom	12	6.73	0.94
	Canada	12	6.77	0.68
	Australia	10	6.33	1.20
	South Africa	8	6.48	0.86
Structure & navigation	United States	14	7.25	0.87
	United Kingdom	12	7.34	0.97
	Canada	12	7.68	0.94
	Australia	10	7.08	0.59
	South Africa	8	7.13	0.53
Video & audio	United States	3	3.03	2.38
	United Kingdom	1	7.25	
	Canada	2	6.50	1.41
	Australia	1	7.25	
	South Africa	0		
Forms	United States	14	5.19	1.88
	United Kingdom	9	5.29	1.96
	Canada	12	5.76	2.05
	Australia	9	6.79	1.89
	South Africa	7	6.77	1.54
Data tables	United States	10	4.70	2.07
	United Kingdom	6	6.08	2.01
	Canada	4	4.75	1.66
	Australia	3	4.50	0.87
	South Africa	2	4.50	0.71
Understandability	United States	14	6.17	1.82
	United Kingdom	12	7.03	1.35
	Canada	12	6.31	0.97
	Australia	10	6.70	2.17
	South Africa	8	6.54	1.85

(*Source*: Authors' data).

Table 2. Differences between main website accessibility characteristics.

	n	Mean	SD
Images & color	51	6.53	0.89
Structure & navigation	51	7.30	0.80
Forms	51	5.84	1.94
Understandability	51	6.54	1.67

(*Source*: Authors' data).

other two properties had missing values): Images and Color, Structure and Navigation, Forms and Understandability. A repeated measures ANOVA was performed with the independent variable being the characteristic type, and the dependent variable the level of the characteristic.

This analysis showed that there were significant differences between the different characteristics, $F(3,150) = 9.11$, $p < 0.001$, $\eta^2 = 0.154$. The subsequent Table 2 shows the differences between the main accessibility characteristics, revealing that Structure and Navigation scored significantly higher than the other categories.

A Bonferroni correction performed following the analysis illustrates that Structure and Navigation were significantly higher than the Images and Color, Forms and Understandability characteristics.

5.2. Legal assessment

Two professional coders independently assessed the legal environment of the websites based on six aspects of the law—Subject Matter, Definition, Clarity, Exemptions, Penalties, and Reporting. The decision to use two coders was deemed sufficient, as previous research suggests that two coders can provide reliable and valid assessments, especially when there are clear evaluation criteria and the coders are well-trained (Cohen, 1960; McHug, 2012; Viera & Garrett, 2005). Each coder assessed the six legal aspects for five different countries (H1.2).

These aspects were theoretically derived to capture distinct components of web accessibility regulation. Conceptually, the construct was treated as formative, rather than reflective, since each dimension represents an unique aspect that contributes to the overall strength of the legal framework, without assuming internal consistency or mutual interchangeability.

Moreover, these six legislative components were designed to capture distinct yet interrelated aspects of web accessibility regulation. While each dimension was examined individually, their conceptual interdependence suggested the potential for an integrated analytical framework. To assess this, the items were evaluated for internal consistency and thematic alignment. The evaluation process confirmed that the components collectively reflect a coherent legal structure, rather than a set of disconnected regulatory attributes. This supported the use of the six elements not only as separate indicators, but also as parts of an unified framework for assessing the comprehensiveness and enforceability of national accessibility legislation.

A first indication of agreement was received by differentiating the scores. Most differed by only one unit over an actual scale of zero to ten (1–10), while the other assessments were identical across coders. The minimum observed assessment level was four and the maximum was eight. These values are shown in Table 3. In addition, country mean assessment, and subject matter assessment are provided, with their standard deviations. For agreement we calculated the common Cohen's Kappa (McHugh, 2012), however, with adjustment to the scale used by the coder to assess the legal aspects (1–10 integer Likert scale). Specifically, the rate of agreement for each country and overall was one less difference over the total expected value, see Table 4. Kappa parameters were calculated for each country and across all countries, as well as Z and p-value and 95 percent confidence intervals. Calculation of a weighted Kappa yielded similar results, that is, on average, we may argue that the agreement levels were weak according to Cohen's categorization, yet this was mainly due to the small number of items to assess and the minimal, only two, number of coders. A complementary internal consistency (Alpha Cronbach) is shown in the legend of Table 4 for each coder.

- numbers are for the legal aspects: (1) Subject Matter; (2) Definition; (3) Clarity; (4) Exemption; (5) Penalties; (6) Reporting.

Table 3. Coders' assessments of national legal accessibility aspects.

	1	2	3	4	5	6	Mean	SD	Diff.
USA	7.5	6.5	6.5	7	6.5	7.5	6.92	0.49	5
UK	7.5	7	6	7	6.5	6.5	6.75	0.52	3
Canada	7	6	5.5	6.5	7	6	6.33	0.61	2
Australia	7	6	5	6.5	6.5	6	6.17	0.68	2
South Africa	5.5	5.5	4.5	5.5	5.5	5	5.25	0.74	5
All Mean	7.00	6.50	5.57	6.71	6.57	6.36	6.45	0.48	22
All Variance	0.50	0.67	0.45	0.41	0.29	0.81	0.23		

(*Source*: Authors' analysis).

Table 4. Inter-coder agreement statistics for legal accessibility assessments.

	Diff.	% Agree	% Chance	Cohen's k	Z	*p*-value
USA	5	88.0	78.8	0.432	4.214	<0.001
UK	3	92.6	86.3	0.460	3.132	<0.001
Canada	2	94.7	90.0	0.472	2.742	0.003
Australia	2	94.6	89.8	0.471	2.345	0.009
South Africa	5	84.1	73.3	0.406	2.668	0.004
All	22	91.9	85.1	0.456	21.16	<0.001

(*Source*: Authors' analysis).

Table 5. Inter-coder reliability (RWG) for legal accessibility aspects.

	S^2	$S^2_{mpv/m}$	R_{WG}
Subject matter	0.571	4.000	0.857
Definition	0.679	4.500	0.849
Clarity	0.531	4.490	0.882
Exemption	0.490	4.408	0.889
Penalties	0.388	1.347	0.712
Reporting	0.801	4.459	0.820
All aspects	0.379	2.559	0.852

(*Source*: Authors' analysis).

Internal consistencies were calculated for each coder and for each pair of assessments by country, regardless of the small number of assessed items. Both coders showed a high level of consistency (Cronbach's alpha; Coder 1: $\alpha = 0.772$; Coder 2: $\alpha = 0.887$). These alpha values represent the consistency at which each coder rated the subject matter across the countries. We further used the R_{WG} coefficient as an intercoder agreement measure. This type of index is the most used as an inter-coder agreement, where the value above 0.80 are considered good, and above 0.70 as fair agreement.

Table 5 shows the intercoder reliability for each legal aspect and across all legal aspects. All calculated indices were high (>0.80) except the one for penalties, which was still at a fair level. Similar calculations were applied to each country across the six aspects, which yielded index levels above 0.75. Overall, we may argue that the rates received from both rates were reliable and applicable to further research. Specifically, by using the mean assessment per each country per each subject matter we were able to correlate the website assessment scores with the legal environment within which these websites were operated.

5.2.1. Regulation and implementation's correlation

Next, we tested the correlation between the website assessments and the legal state assessments in the complete dataset ($n = 56$ websites) (H1). Table A1 shows these correlations between the website assessment item and the legal aspect assessment. This is a partial list for those correlations which appeared to be significant ($p < 0.05$). In this table, the correlation between each legal subject-matter and the website assessment is given followed by their actual *p*-value. For example, sufficient color and sufficient color contrast were found to positively correlate with clarity aspect ($r = 0.417$, $p < 0.01$) and this was consistent with exemption, penalties and reporting ($r = 0.402$, $p < 0.01$; $r = 0.409$. $p < 0.01$; $r = 0.400$, $p < 0.01$; respectively). In another website assessment, these correlations were found to have a negative effect, e.g., (use of linked images and ($r = -0.392$, $p < 0.01$; $r = -0.347$, $p < 0.01$; $r = -0.316$, $p < 0.05$; $r = -0.390$, $p < 0.01$; $r = -0.269$, $p < 0.05$; $r = -0.316$, $p < 0.05$) for subject matter, definition, clarity, exemption, penalties, and reporting, respectively. The complete list is shown in Appendix A.

6. Discussion

This study examines the relationship between web accessibility legislation and accessibility practices in commercial websites across five English-speaking countries, combining a comparative perspective with contributions to theory and method. Methodologically, the study systematically links detailed website-level accessibility assessments with a structured analysis of legal frameworks at the level of specific legal components. At the theoretical level, the paper frames web accessibility as influenced by how

accessibility laws are designed and operationalized, rather than treating regulation as an uniform background condition.

The findings show that e-commerce websites in the United States, United Kingdom, Canada, Australia, and South Africa exhibit broadly similar levels of web accessibility, with no substantial differences observed across the accessibility features examined (Table 1). These features represent observable website characteristics derived from the Web Content Accessibility Guidelines (WCAG) 2.1, which define accessibility through a set of testable Success Criteria (SC). Specifically, the evaluation assessed whether websites provide text alternatives and sufficient color contrast (SC 1.1.1, 1.4.3), apply clear semantic structure and consistent navigation mechanisms (SC 1.3.1, 2.4.1, 2.4.6), and support accessible form interaction through appropriate labeling and error identification (SC 3.3.1, 3.3.2). Across all countries, features related to Structure and Navigation received the highest scores, indicating more consistent implementation of these WCAG 2.1 requirements (Table 2; W3C, 2018).

In contrast, greater variation was observed in the legal frameworks governing web accessibility. The United States and the United Kingdom demonstrated higher levels of regulatory clarity and enforcement, while South Africa scored lowest overall (Tables 3 and 4). Importantly, the findings reveal meaningful associations between legal environments and WCAG 2.1–aligned accessibility features: compliance with minimum color contrast (SC 1.4.3) was positively associated with stronger legal frameworks, whereas the use of linked images without adequate text alternatives (SC 1.1.1) was negatively associated with stricter regulatory regimes (Appendix A).

6.1. Web accessibility evaluation

Accessibility is not merely a matter of ethical consideration; it is a legal imperative. The United Nations Convention on the Rights of Persons with Disabilities (CRPD), ratified by a majority of countries worldwide, mandates accessible information and communication technologies (Article 9). This includes provisions for accessible formats, such as providing text alternatives for audio and visual content, ensuring equal access to information for all users (Article 21) (UN Enable, 2001, 2006).

Hence, the aim of developing accessible websites is to create a more inclusive digital environment for all users (van Deursen & van Dijk, 2019). Nevertheless, as Gonçalves et al. (2018) caution, while usability for all improvements can enhance accessibility, they do not necessarily ensure that the specific needs of users with disabilities are fully met.

This research evaluated the accessibility of e-commerce websites using a combination of automated tools and manual testing to identify barriers that impact users with disabilities. Automated tools, while essential, are limited in their scope, typically detecting only 30–50% of accessibility issues (Sutton, 2021). This underscores the need for manual testing to assess usability and address more complex barriers, such as video content and user interaction challenges (Matuzović, 2020), like has been done in this research.

For example, the following Figure 1 illustrates how automated tools, such as a WCAG Color Contrast Checker, were used to evaluate visual accessibility features and ensure sufficient contrast between text and background colors. Additionally, the next Figure 2 presents a manual captioning test, demonstrating how video materials were reviewed to verify compliance with accessibility standards for multimedia content. These examples highlight the complementary roles of automated and manual methods used in this study.

The web accessibility evaluation showed that e-commerce websites in the USA, UK, Canada, Australia, and South Africa exhibited broadly similar accessibility patterns across Images and Color, Structure and Navigation, Video and Audio, Forms, Data Tables, and Understandability (Table 1). Structure and Navigation consistently achieved the highest scores (Table 2), indicating more reliable implementation of WCAG 2.1 Level AA success criteria related to semantic structure and navigability (SC 1.3.1; 2.4.1; 2.4.6) (H1.1). This distribution is consistent with prior empirical evaluations reporting uneven compliance across website components, with structural features less frequently associated with accessibility barriers than interaction- and content-intensive elements (Ismailova & Inal, 2018; Noh et al., 2015). By contrast, lower scores for multimedia, forms, and data tables point to recurring gaps in WCAG 2.1 criteria related to alternatives for prerecorded media and input assistance (SC 1.2.1; 1.2.2; 1.2.3; 3.3.1; 3.3.2), aligning with evidence that accessibility barriers tend to concentrate in complex online tasks (Dobransky & Hargittai, 2016; W3C., 2018). Taken together, these findings enrich prior

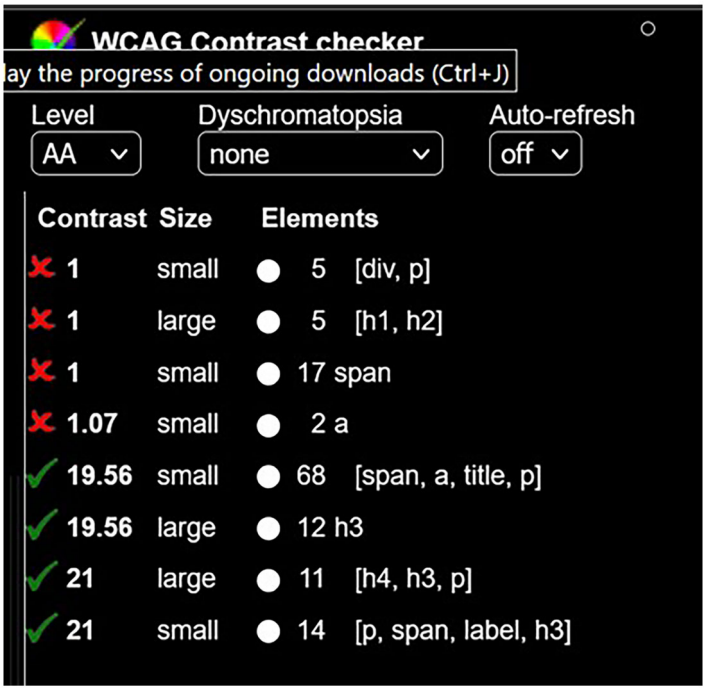

Figure 1. Example of an automated WCAG color contrast evaluation. *Source*: Authors' screenshot from an accessibility testing tool.

Figure 2. Manual evaluation of video captions. *Source*: Authors' screenshot (YouTube (Sainsbury's, 2017)).

research by demonstrating that accessibility gaps previously documented mainly in institutional settings also characterize large-scale commercial platforms across multiple national contexts.

> Accordingly, while understanding the findings in the context of the Social Model of Disability, businesses should prioritize key accessibility areas such as video/audio content, forms, and data tables (Appendix A), where people with disabilities face the most significant challenges (Table 2), and comply with global standards like WCAG (W3C., 2018) to ensure consistent accessibility across regions (Bigby, 2019). Likewise, adopting inclusive design practices and supporting assistive technologies—such as screen readers and magnifiers—reflects the Social Model's call for environmental changes to accommodate diverse needs, rather

than focusing on fixing and the individual (Aleksandrova & Nenakhova, 2019; Oliver & Barnes, 2010; van Deursen & van Dijk, 2019)

Nevertheless, an exclusive reliance on technical fixes and automated tools risks reproducing a medical model of disability, in which accessibility barriers are treated as individual problems rather than as outcomes of organizational and systemic design choices (Krawiec & Dudycz, 2017; Oliver & Barnes, 2010). To address this, commercial corporations should implement accessibility through concrete organizational practices: integrating accessibility requirements into early design and procurement stages; systematically involving people with disabilities in usability testing and evaluation processes; and assigning clear internal responsibility for accessibility across product teams rather than confining it to technical specialists (Ferri & Favalli, 2018; Gjerde & Alvesson, 2020). Beyond formal compliance, organizations should complement automated checks with ongoing qualitative feedback to capture barriers that emerge in real use (Schur & Adya, 2013). Normatively, this shift reframes web accessibility as a matter of organizational accountability and social justice, positioning accessibility obligations not merely as technical standards to be met but as expressions of how power, inclusion, and exclusion are structured within digital systems (Adam & Kreps, 2006; Oliver & Barnes, 2010).

6.2. Legal assessment

Websites should be recognized as public spaces, equivalent to physical places, offering accessibility opportunities for all users. Similar to restaurants, grocery stores, public institutions, and hospitals, websites function as essential public environments (Freeman et al., 2020). Just as physical spaces are required to provide accessible accommodations under the CRPD and the social model of disability (Bratan et al., 2020; Morris, 2001), commercial websites must also ensure accessibility in line with EU Directiveon web accessibility (EU Union, 2021; Ferri & Favalli, 2018).

The societal impact of law is inherently multifaceted, as legal frameworks may operate both as instruments of protection and as mechanisms that reproduce exclusion. While laws can promote social order, protect individuals from harm, and advance justice (Sharma, 2023), they may also entrench discrimination against marginalized groups when legal duties are framed narrowly or enforced inconsistently (Freeman et al., 2020). Within the doctrinal framework of web accessibility articulated in this study, this tension is reflected in judicial approaches that conceptualize inaccessible websites either as neutral technical artifacts or, alternatively, as service environments whose design can produce unequal access. As demonstrated in accessibility case law, when inaccessibility is treated as a functional barrier to accessing goods, services, or information, it is doctrinally aligned with principles of nondiscrimination rather than with discretionary technical compliance. Accordingly, the effectiveness of accessibility law depends on doctrinal features such as clarity, enforceability, and normative alignment with equality values, which determine whether accessibility obligations are interpreted as binding duties shaping organizational behavior or as peripheral technical recommendations with limited social impact (Heyer, 2007).

From a business perspective, the enforcement of web accessibility laws can be interpreted through Vroom's expectancy model, according to which organizations are more likely to invest in accessibility when they anticipate that compliance will produce tangible benefits or avert negative consequences (Sycheva et al., 2019; van de Van & Graafland, 2006). Within the legal doctrine governing digital accessibility, such expectations are shaped by how clearly accessibility obligations are articulated, how broadly they apply to digital services, and how credibly they are enforced through sanctions or remedial mechanisms. When accessibility requirements are framed as binding legal duties—rather than aspirational guidelines—organizations are more likely to internalize accessibility as a strategic priority aligned with both regulatory compliance and corporate responsibility objectives (Leitner & Strauss, 2010). Hence, clear and enforceable accessibility laws function not only as compliance instruments but also as normative signals that define accessible websites as integral components of equal participation and nondiscrimination in the digital marketplace (Hoepner & Schopohl, 2019).

In this study, the legal assessment revealed substantive cross-national disparities in the regulatory environments governing web accessibility (Tables 3 and 4). The USA and the UK exhibited higher

mean scores, particularly with respect to definitional clarity and enforceability, indicating more stable and predictable compliance expectations. By contrast, South Africa ranked lowest overall, reflecting comparatively weaker regulatory definition and enforcement mechanisms (Tables 3 and 4). These findings support H1.2, which hypothesized that web accessibility regulations that are more comprehensive, clearly articulated, and effectively enforced are associated with higher levels of compliance (Levin, 2018; Majambere, 2011). This pattern is consistent with prior comparative research showing that, despite shared formal commitments to international disability rights frameworks, national legal regimes vary substantially in how accessibility obligations are operationalized and enforced in practice (Bratan et al., 2020; Meral & Turnbull, 2016; Yang & Chen, 2015).

Beyond formal compliance, the policy implication of the findings is that web accessibility in commercial digital services should be treated as a binding public-interest obligation rather than as a discretionary technical enhancement. Normatively, this positions accessibility as a condition for equal participation in digital markets, consistent with the social model of disability and socio-legal accounts of digital exclusion as structurally produced (Ellcessor, 2016; Hosking, 2008; Oliver, 1990). From a regulatory perspective, effectiveness depends less on the proliferation of new rules than on the consistent operationalization of existing obligations—through clear allocation of responsibility, predictable enforcement signals, and stable expectations regarding compliance outcomes (Levin, 2018; Yu, 2002). For organizations, this underscores the need to internalize accessibility as part of routine governance and risk management, rather than as an one-time compliance exercise, while recognizing that many accessibility barriers remain experiential and cannot be fully captured through automated testing alone (Goggin & Newell, 2005; Krawiec & Dudycz, 2017).

6.3. Legal requirements and actual implementation

Web accessibility has gained significant legal traction in recent years, with numerous countries enacting legislation mandating accessible websites and digital content (Bigby, 2019). These laws often reference international standards like the WCAG to provide specific requirements (W3C, 2008). However, the gap between legal requirements and actual implementation remains a critical concern. Various factors, including technical complexity, lack of awareness, and resource constraints, can hinder organizations from fully adhering to accessibility standards (de Andrés et al., 2009), despite the existence of clear legal obligations (Abu Addous et al., 2016; AudioEye, 2022).

The social model of disability argues that disability is not primarily a medical condition of the individual but a result of societal barriers that exclude and marginalize people with impairments (Linton, 1998). This perspective aligns with the expectation model (Sycheva et al., 2019), which emphasizes how societal norms and expectations often impose unnecessary or outdated solutions on people with disabilities (Attakora-Amaniampong et al., 2024). For example, the expectation model reflects the tendency to design tools or environments based on assumptions about what is "normal" or "functional," instead of focusing on inclusive solutions that meet diverse needs.

The results of the analysis provide strong support for H1, indicating that stronger and more effectively enforced web accessibility regulations are associated with higher levels of website accessibility. Significant positive correlations were found between the clarity of legal aspects and website accessibility features, such as sufficient color and contrast, which also correlated with exemptions, penalties, and reporting. Conversely, some website elements, such as the use of linked images, showed negative correlations with legal aspects like subject matter, definition, clarity, exemptions, penalties, and reporting.

The following Figure 3 presents a correlation scatter plot illustrating the relationships between web accessibility features and the strength of legal frameworks across the examined countries. Positive correlations, such as those between color contrast and legal clarity, are represented by circular markers, while negative correlations, such as the use of linked images, are shown with cross markers. The figure demonstrates how stronger and clearer legislation is associated with higher levels of accessibility compliance among e-commerce websites.

The findings suggest that persistent accessibility gaps stem less from the absence of legal standards and more from failures to translate formal obligations into routine organizational practice. Even where legal duties are clearly articulated, accessibility often remains disconnected from procurement, product

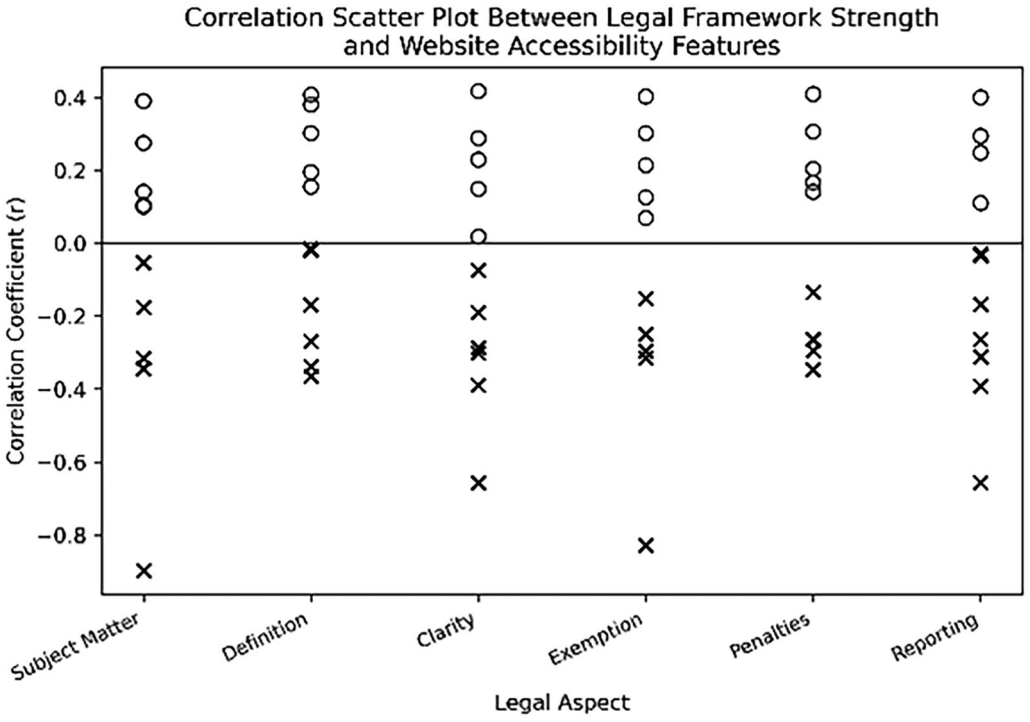

Figure 3. Correlation scatter plot between website accessibility features and legal aspects. (*Source*: Authors' analysis).

governance, and quality assurance workflows. Addressing this gap requires embedding accessibility into existing operational infrastructures—such as vendor contracting, release management, and product accountability—so that accessibility considerations shape decisions throughout the lifecycle of digital services rather than being addressed post hoc. From a normative perspective, this shifts web accessibility from a discretionary compliance task to a structural condition of equal participation in digital markets, aligning legal obligations with the broader principle that exclusion in digital environments is produced by institutional design choices rather than individual limitations (Hosking, 2008; Krawiec & Dudycz, 2017; Oliver, 1990; W3C, 2018).

7. Conclusion

This study examined the relationship between web accessibility in commercial websites and the enactment and enforcement of web accessibility legislation across five national contexts: the United States, the United Kingdom, Canada, Australia, and South Africa. Through a comparative analysis of accessibility practices and legal frameworks, the research assessed how differences in regulatory approaches are reflected in real-world accessibility outcomes within the commercial digital environment.

The findings advance a theoretical understanding of web accessibility as a structurally and institutionally produced outcome, rather than a purely technical feature or voluntary organizational choice. They demonstrate how accessibility outcomes in commercial websites are shaped by the clarity and enforceability of legal obligations, illustrate the value of integrating accessibility evaluation with regulatory analysis, and provide comparative insight into how national legal contexts influence practical accessibility implementation in the business sector.

Website accessibility was evaluated using WCAG 2.0 and 2.1 guidelines, focusing on visual, auditory, operational, and content barriers (Goggin & Newell, 2005). A customized checklist based on WCAG AA standards was used to assess websites on a 0–10 scale (DingoAccess, 2011), including six areas of a website: Image and Color, Structure and Navigation, Video and Audio, Forms, Data Tables and Understandability. Both automated and manual testing methods were employed (Krawiec & Dudycz, 2017). Additionally, the effectiveness of accessibility laws in these countries was assessed by two independent coders, focusing on criteria such as subject matter, definition, clarity, exemptions, penalties,

and reporting, in a same numeric scale (Bratan et al., 2020; Levin, 2018; Majambere, 2011; Meral & Turnbull, 2016; Yang & Chen, 2015).

The web accessibility features across e-commerce websites in the USA, UK, Canada, Australia, and South Africa exhibit overall similarity, with no significant differences in categories such as Images and Color, Structure and Navigation, Video and Audio, Forms, Data Tables, and Understandability. Among these, Structure and Navigation consistently achieved the highest scores (H1.1). Conversely, Legal analysis revealed notable differences, with the USA and UK scoring higher in clarity and enforcement, while South Africa ranked lowest overall (H1.2). Finally, correlations were identified between accessibility features and the legal environment. For example, sufficient color contrast correlated positively with stronger legal clarity, exemptions, and penalties, whereas practices like linked images showed negative associations with stricter regulatory frameworks (H1).

Organizations should operationalize web accessibility by embedding WCAG requirements into routine decision-making across design, development, and release processes, treating accessibility as a standard condition of digital quality rather than a corrective add-on (W3C, 2018). In practice, this requires combining automated checks with systematic manual inspection of key user tasks—particularly forms and multimedia content—where barriers most commonly persist (Krawiec & Dudycz, 2017; Noh et al., 2015). Consistent with the social model of disability, organizations should ensure compatibility with assistive technologies and incorporate structured input from people with disabilities to capture barriers that are experiential rather than purely technical (Morris, 2001; Oliver & Barnes, 2010; Goggin & Newell, 2005). At the policy level, the findings suggest that clearer statutory duties and predictable enforcement mechanisms can support these practices by reinforcing accessibility as a routine organizational responsibility within commercial digital services (Levin, 2018; Majambere, 2011; Yang & Chen, 2015).

8. Future research

- Longitudinal Study of Web Accessibility Improvements - explore how the level of web accessibility across e-commerce websites evolves over time in relation to changes in legislation. This could involve examining whether legal reforms lead to sustainable improvements in accessibility, considering variables like website design trends and technological advancements
- Comparative Analysis of Accessibility Practices in Different Sectors - expanding your research beyond e-commerce to include other sectors (e.g., healthcare, education, government) could provide insights into how accessibility practices vary and how laws apply differently across industries.
- User-Centered Evaluations of Accessibility Laws - Conduct a study that directly involves people with disabilities to evaluate their experiences with websites subject to different accessibility laws. How do users perceive the effectiveness of these laws? This qualitative research could provide valuable insights into the real-world impact of regulations on the disabled community.

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Author contributions

CRediT: **Harel Chait**: Conceptualization, Data curation, Formal analysis, Investigation, Methodology, Validation, Visualization, Writing – original draft; **David G. Schwartz**: Conceptualization, Supervision, Writing – review & editing.

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Appendix A. Web accessibility and legal aspects correlation

The upcoming Table A1 presents the correlation coefficients between website accessibility features and the legal aspects, highlighting both positive and negative relationships between regulation strength and accessibility implementation.

- Numbers are for the legal aspects: (1) Subject Matter; (2) Definition; (3) Clarity; (4) Exemption; (5) Penalties; (6) Reporting.

Table A1. Correlations between website accessibility items and legal aspects.

Website assessment item/correlations with the legal aspects	(1)	(2)	(3)	(4)	(5)	(6)
Use of linked images with an appropriate text alternative (alt text) and a descriptive title (title)	−0.316* 0.013	−0.269* 0.036	−0.390** 0.002	−0.316* 0.013	−0.347** 0.006	−0.392** 0.002
The minimum size of a regular text will be 18 points, and a bold text will be 14 points	0.275* 0.032	0.302* 0.018	0.288* 0.025	0.302* 0.018	00.204 0.115	0.294* 0.022
Use more than on designed elements (for example: color and bold) as the way of conveying information or functionality	−0.344** 0.007	−00.015 0.911	−0.287* 0.025	−0.297* 0.02	−0.264* 0.04	−0.264* 0.04
Sufficient color contrast between foreground (text) and background (at least 1:4.5)	0.390** 0.002	00.195 0.132	0.417** <0.001	0.402** 0.001	0.409** 0.001	0.400** 0.001
Use of an appropriate markup for headings and sub-headings that convey the document structure (e.g., H1–H6, semantic elements and landmarks)	0.1 0.456	−0.365** 0.005	0.018 0.894	0.069 0.608	0.141 0.291	−0.034 0.799
Enable to visually identify when a page component revives focus via the keyboard (e.g., Visual keyboard focus)	0.141 0.279	0.380** 0.003	0.229 0.076	0.214 0.097	0.166 0.201	0.248 0.054
Prerecorded audio-only or video-only material with an accessible alternative that presents equivalent information (a summary)	−0.898** 0.006	0.407 0.365	−0.657 0.109	−0.829* 0.021	−0.262 0.57	−0.657 0.109
Enable to programmatically identify form inputs (e.g., Through use of explicitly associated labels and title attribute)	−0.176 0.193	−0.338* 0.011	−0.302* 0.024	−00.25 0.064	−0.294* 0.028	−0.312* 0.019
The keyboard appears on mobile devices when filling special fields (like telephone, email etc.) will be match the letter types are needed.	−0.316* 0.024	−0.02 0.888	−0.191 0.18	−0.295* 0.035	−0.135 0.343	−0.168 0.24
Page title and headings and form labels and instructions are clear and easy to understand	−0.053 0.685	0.155 0.232	−0.075 0.566	−0.151 0.245	−0.266* 0.038	−0.028 0.83
Explanation or definition is provided for unusual words and abbreviations	0.104 0.424	−0.169 0.192	0.149 0.252	0.126 0.333	0.306* 0.016	0.11 0.398

(*Source*: Authors' analysis).
For each assessment item, the upper value is the correlation coefficient, and the lower is the actual *p*-value.
*$p < 0.05$; **$p < 0.01$.