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Equitable Digital Communication Solutions: An Evaluation of Web Accessibility Among Patient
Resources

LAUREN CARLIN GROFF
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Reviewed and approved* by the following:

Frank Dardis
Associate Professor of Advertising and Public Relations
Thesis Supervisor and Honors Adviser

Tara Wyckoff
Associate Teaching Professor of Advertising and Public Relations
Faculty Reader

* Electronic approvals are on file.

ABSTRACT

The purpose of this study is to define, identify, and compare the level of web accessibility among patient resources provided by various healthcare companies across the medical device, pharmaceutical, and biotech industries. A rubric assessing various accessibility features among patient resources demonstrates Boston Scientific and Johnson & Johnson as providing the most equitable and accessible resources for their patients. Evaluating ethical, legal, and practical elements of the issue, recommendations are made to improve accessibility initiatives among healthcare corporations and positively impact patient-facing resources.

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Chapter 1

INTRODUCTION

In the twenty-first century, access to the internet has become an essential part of everyday life. From accessing health information and reading news updates to gathering transportation information and receiving emergency alerts, humans rely more on the world wide web than ever before. While lack of technological literacy may be the foremost barrier to entry for many users, considering web accessibility is equally salient in the pursuit of fair, equitable access to the internet and the many resources it provides.

The Web Accessibility Initiative defines web accessibility as “*websites, tools, and technologies [that] are designed and developed so that people with disabilities can use them. More specifically, people can: perceive, understand, navigate... interact with...[and] contribute to the Web*”(Web Accessibility Initiative [W3], 2023).

A variety of disabilities can create challenges while attempting to gather information online. Cognitive, physical, auditory, visual, speech, and neurological disabilities have the potential to negatively impact one’s user experience and limit the functionality of certain interactive features. According to Shadi Abou-Zahra, Accessibility Strategy and Technology Specialist at W3C, “*There are over one billion people with disabilities, or about 15-20% of the population. The UN Convention of the Rights of Person with Disabilities defines access to*

information, including the web, as a human right” (Video Introduction to Web Accessibility and W3 Standards [video], Web Accessibility Initiative [W3], 2017).

Creating accessible online material does not only benefit those with disabilities, but those with situational limitations, temporary disabilities, or circumstantial situations. These may include but are not limited to individuals with decreased abilities due to aging, limited access to a stable internet connection, or those in developing countries (Web Accessibility Initiative [W3], 2023). Therefore, the number of users with limitations or disabilities steadily increases as generations continue to age. Adapting web material so that it is easily digestible for all users, regardless of disability or extenuating circumstance, is an increasingly important initiative as dependency on mobile technology heightens and generations continue to age.

This thesis is an examination of web accessibility, its implications, and a comparative analysis of patient resources offered by some of the largest and most well-respected biotech, pharmaceutical, and medical device companies across the healthcare industry. A review of pertinent accessibility components, federal court cases, and a deeper dive into the codependent user-developer relationship are all considered in offering recommendations to improve digital accessibility initiatives in the healthcare space.

Access to readily available medical information online should be a guaranteed right for all. Consideration for the visual and hearing-impaired community should be placed at the

forefront of web development in the twenty first century. Doing so will ensure an equitable digital landscape in an increasingly technology-reliant society, so that no one is left behind.

Chapter 2

LITERATURE REVIEW

Important Features of Web Accessibility

(Sourced from W3 *Introduction to Web Accessibility* and W3C *Standards and Tips and Strategies to Promote Accessible Communication*, produced by *The North Carolina Office on Disability and Health with Woodward Communications*)

Elements of accessible website features include, but are not limited to:

Alternative Formats:

Captions / Subtitles

Incorporating captions and subtitles on audio or video components allows individuals who are deaf or hard of hearing to follow along and understand the information being presented in an alternative format.

Text-to-Speech

Blind and dyslexic users often rely on this feature to guide them through the information presented online. This option allows for the information conveyed to be read aloud and is readily available at the click of a button.

Alternative Text

Alternative text accompanies any graphics presented on a webpage. It explains the purpose and essence of the image being described. This includes brand logos, e.g., “Logo for (company name)”

Keyboard Compatibility

Both physical limitations and temporary circumstances can prevent the proper usage of a mouse or touchpad to scroll through web pages. Sites should be operable entirely by keyboard if necessary.

Voice Recognition

Those with physical disabilities rely on this assistive feature to navigate websites. Voice recognition allows the user to speak out loud how they wish to interact with the site. Sites and apps must be properly coded for this feature to align accurately and be compatible with the page.

Navigational and Structural Elements:

Clear Layout & Design

Navigational structure should be clear and consistent throughout the entirety of the site. Crucial navigation options, including menu bars and buttons should be easily visible at the top of the page. People with visual impairments will be able to find these features more easily when formatted in a user-friendly way.

Color Contrast

Utilizing clear, contrasting colors is crucial in an effort to make all website contents accessible for those with color deficits or low-contrast sensitivity, which can increase over time as individuals age. A quick, easy way to test if color choices have enough contrast to be easily deciphered is temporarily converting the page to black and white.

Buttons, Controls, and Links

Interactive features such as buttons, controls and links should have a large surface area and be easily pressable and visible. This is critical for individuals with reduced dexterity due to physical limitations.

Notifications and Feedback

Embedding feedback messages and notifications with clear instructions enhances the overall user experience, especially for those with learning or cognitive disabilities. For example, an error message ambiguously stating, “error, invalid date” does not provide the user with clear instructions on how to fix their input. Instead, feedback should be as specific as possible, e.g., “month/day/year’ e.g. 02/14/2006”

Interdependence: The Relationship Between Developers and Users

Authoring Tools & User Experience

Placing web accessibility at the forefront of innovative solutions begins with those who build websites on the backend: developers. Developers utilize software (authoring tools) to create the content that appears online.

Conversely, on the other side of the screen – both literally and metaphorically – users access the content developers create. Individuals with disabilities often rely on assistive technologies to make the user interface more accessible. A variety of both input and display

assistive technologies exist, and can include screen readers, screen magnification software, and alternative input devices. Alternative input devices particularly benefit those with cognitive or physical disabilities, and utilize unique technologies such as motion tracking, head pointing, or speech input software to guide users through online resources (Yale, 2024).

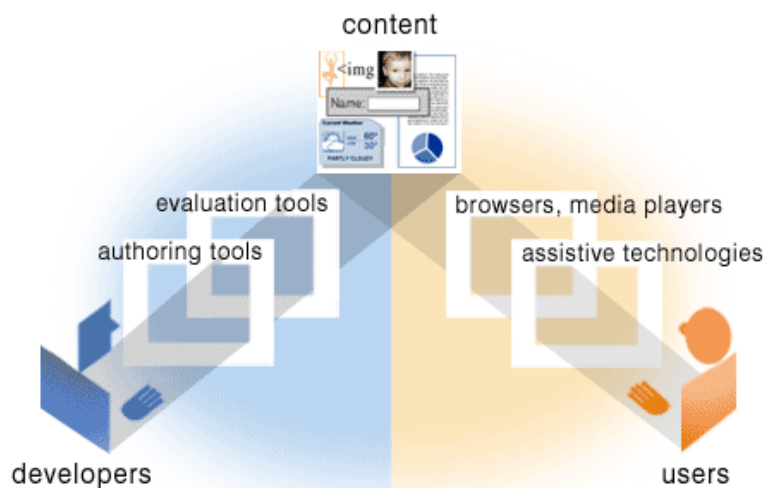


Figure 1. Developer-User Relationship, [image of courtesy of W3]

Confirming both components meet accessibility guidelines is key. Sometimes authoring tools are not properly equipped with accessibility support components, leading to a lack of accessibility options on the user experience side. When developers do not have the necessary support available in their authoring tools software, they may choose on a case-by-case basis to fix the problem manually. However, these creative solutions are labor-intensive and require a bit of extra time and attention from the developer. A lack of resources among developers therefore directly correlates to a decreased chance in enhanced accessibility features for users, which can also hinder the usage of assistive technologies. Without proper coding, tools such as voice recognition cannot function properly (Web Accessibility Initiative, [W3], 2018). Ensuring that

authoring tools are equipped with the proper components to make accessibility features easy to implement is key to increasing web accessibility and a more equitable user experience.

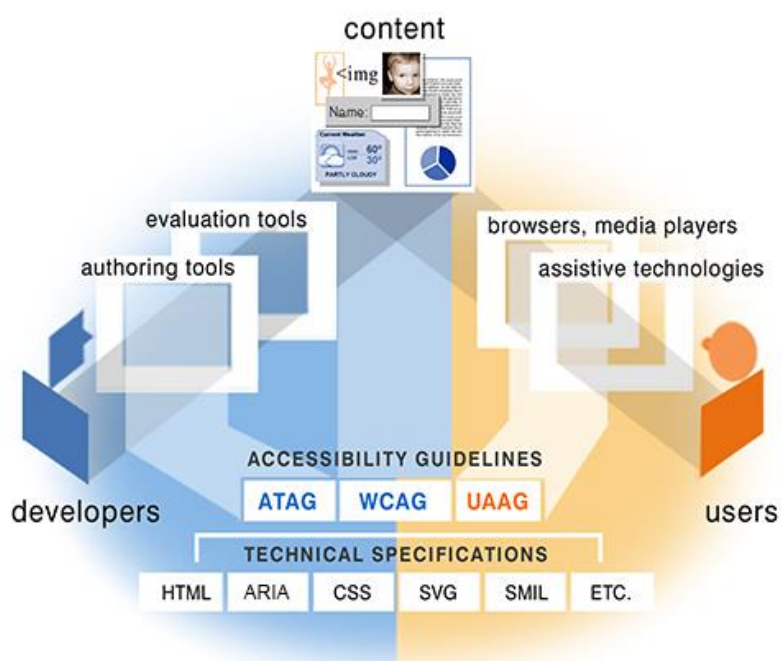


Figure 2. Codependent Accessibility Standards, [image courtesy of W3]

Considerations for Developers

Aside from referencing accessibility guidelines and resources, developers should take the thoughts and suggestions of real users into consideration when designing accessible websites.

Yale’s ITS Web Technologies team suggests, “Stakeholders — even ones that interact with users directly — often have goals that are different from and even in tension with users’. So, it’s best to seek out other, objective sources” (Yale, 2024).

In the pursuit of crafting the most inclusive, user-friendly experience possible, developers and the corporations they work on behalf of should seek the expertise of individuals with disabilities who rely on accessibility features and assistive technologies to browse the web.

User Interviews

Because the realistic needs of users can oftentimes vary from the goals and expectations of stakeholders, conducting user interviews is a crucial step to ensure optimal accessibility when developing web content. Leveraging solicited feedback from interviewees puts realistic accessibility barriers and potential concerns as the central focus of preliminary troubleshooting efforts.

Yale ITS Services cites one major advantage of conducting user interviews as the opportunity to “...get a very authentic sense of the goals that website users have, the tasks they complete, and the challenges they create” (Yale, 2024).

Important consideration should be given to following proper procedures and safeguards in the best interest of participants. Firstly, interviews should be conducted before major design decisions are made; this ensures that user feedback and concerns are at the forefront of innovation. The interview experience should feel comfortable and secure, conducted as a casual conversation to promote open communication and truthful feedback from participants. Before recording interviewee responses, researchers must ask for permission to do so. Audio recording is often superior to note taking, as the conversation can be recorded verbatim and replayed for

future reference. Additionally, freedom from note taking grants researchers the opportunity to be fully present with participants, furthering fostering trust and mutual respect (Yale, 2024).

Heuristic Evaluation

Fielding firsthand interactions with the site being constructed is the best way to elicit truthful feedback and uncover potential oversights. Identifying and gathering participants may prove difficult; a secondary method of review is a heuristic analysis.

Simply put, a heuristic evaluation is a method to easily identify problems on the user experience side before continuing further development on a project. The Interaction Design Foundation describes the heuristic evaluation process to “help highlight potential usability issues early in the design process,” noting, “It is a fast and inexpensive tool compared with other methods involving real users” (Interaction Design Foundation, 2023).

This type of evaluation requires 3-5 trained individuals, assigned to analyze and evaluate the user experience of a particular site. Evaluators may be provided with user personas, or fictional characters with attributes mirroring those of individuals with particular disabilities, to help guide their evaluation process and keep the wants and needs of different types of users in mind. While a heuristic evaluation is not a perfect replacement for a focus group, it can be helpful in identifying potential user experience barriers early in the design process.

Law & Policy

Application and Coverage in the United States

With the support of both governmental and non-governmental organizations, a variety of laws and guidelines have been put in place to promote web accessibility for all Americans. An unorganized or confusing interface can be frustrating for any user, regardless of abilities. For a disabled user, a lack of resources or compatibility with assistive devices immediately diminishes equal access. Like a wheelchair-bound individual facing a staircase-only entry, a disabled user attempting to navigate a website without proper coding or adaptive resources is immediately barred from viewing and engaging with the services offered.

Americans with Disabilities Act

Title II of ADA, the Americans with Disabilities Act, “prohibits discrimination against people with disabilities in all services, programs, and activities of state and local governments” (ADA.gov, 2022, para. 9). Underneath this protection, participation in federal, state and local government programs must be equitably navigable both in-person and online. In recent years, civic engagement opportunities have increasingly become available on the internet. Civic duties and constitutional rights such as applying for benefit programs and absentee ballots, or filing police reports and tax documents, all exist online. The Department of Justice declares “all goods, services, privileges, or activities,” offered to the public must comply with ADA guidelines, and advises content on the web must also follow the same requirements. National and regional level laws can exist in tandem. While ADA is on the federal level, “18 US states have put into place

their own statutes pertaining to technology accessibility” (Web Accessibility Policy and Law, Lazar, 2018).

Aside from the widely known ADA, other technical guidelines and standards have been established in an attempt to hold private entities accountable for ensuring their online materials are accessible for all Americans. Web Content Accessibility Guidelines, commonly referred to as WCAG 2.2, is widely respected and utilized by the federal government in the composition of its own websites (ADA.gov, 2022).

The World Wide Web Consortium and WCAG 2.2

Published by the World Wide Web Consortium, WCAG 2.2 outlines a technical standard for achieving web accessibility internationally. Developed by an international collection of organizations and individuals, the 13 Guidelines are intended to educate web content developers, authoring tool developers, and web accessibility evaluation tool developers on best practices, vital resources, and necessary requirements when crafting an accessible website. The Guidelines are disseminated among four guiding principles, as outlined below:

Perceivable

- Provide *text alternatives* for non-text content.
- Provide *captions and other alternatives* for multimedia.
- Create content that can be *presented in different ways*, including by assistive technologies, without losing meaning.
- Make it easier for users to *see and hear content*.

Operable

- Make all functionality available from a keyboard.
- Give users enough time to read and use content.
- Do not use content that causes seizures or physical reactions.
- Help users navigate and find content.
- Make it easier to use inputs other than keyboard.

Understandable

- Make text readable and understandable.
- Make content appear and operate in predictable ways.
- Help users avoid and correct mistakes.

Robust

- Maximize compatibility with current and future user tools.

(sourced from WCAG 2 at a Glance, published by the W3, <https://www.w3.org/WAI/standards-guidelines/wcag/glance/>)

While WCAG guidelines are considered a rulebook for best practices to achieve the most accessible website possible, they are not explicitly enforced by law. However, ADA's structure "encourages private enforcement through court cases" (Web Accessibility Policy and Law, Lazar, 2018). Therefore, entities in the United States with websites that fail to comply with accessibility guidelines face a heightened risk of legal settlements, negative press, and lawsuits.

National Federation of the Blind v. HRB Digital LLC. and HRB Tax Group (H&R Block)

In 2013, the National Federation of the Blind filed a lawsuit against HRB Digital LLC. and HRB Tax Group, alleging its online presence did not comply with ADA guidelines. The resources available on www.hrblock.com including information on filing taxes, online chat features, electronic tax-return filing and more were not coded properly, deeming them incompatible with assistive devices including screen reading technology, keyboard navigation, and more.

H&R Block was fined a civil penalty of \$55,000 and paid a total of \$45,000 to the two individual plaintiffs. In addition to monetary reparations, the company entered a five-year consent decree with the Justice Department to ensure updates were made to H&R Block's website and mobile apps, aligned with WCAG 2.2 guidelines. In compliance with Title III of ADA, a new set of requirements were put into place including the formation of a cross-functional Web Accessibility committee, established training procedures for customer service specialists to specifically assist disabled users, and a mandatory user accessibility testing group to Beta test H&R Block's published materials online. Additionally, the Decree required the appointment of a designated Web Accessibility Coordinator to ensure all terms of the Consent Decree were met across H&R Block's digital presence. (U.S. Department of Justice, 2014).

National Federation of the Blind v. Target

A class action lawsuit was filed by the National Federation of the Blind against Target Corporation, the popular big box store selling a variety of home and family merchandise. Plaintiffs claimed Target's online shopping experience presented significant challenges for disabled users, its website devoid of proper coding to support screen reading software commonly utilized by blind and visually impaired users to obtain information online. Additionally, resources and information pertaining to corporate functions including "employment opportunities, investor news, and company policies" were not compatible for accessible browsing.

Target motioned to dismiss the suit, arguing that they were not legally required to make their online site accessible. The court denied the motion, citing that federal and state civil rights laws do, in fact, apply to Target's online website including the California Unruh Civil Rights Act, California Disabled Persons Act and Americans with Disabilities Act. While Target attempted to claim only its physical brick-and-mortar merchandise locations were legally bound to comply with accessibility guidelines, the court held their stance that "all services provided by Target, including its Web site, must be accessible to persons with disabilities" (National Federation of the Blind, 2006).

Chapter 3

METHODOLOGY

Basis of Evaluation

The basis of this evaluation method is largely grounded in the requirements and guidelines identified by the WAVE Web Accessibility Evaluation Tool, published by WebAIM. WebAIM, “Web Accessibility In Mind”, is “a non-profit organization based at the Institute for Disability Research, Policy & Practice at Utah State University” (www.webaim.org, 2024).

The WAVE evaluation tool is a free, publicly accessible resource that allows users to simply copy and paste a website address into its search bar. The system then scans the desired web page for accessibility roadblocks, replicating the page in an interactive user interface sprinkled with buttons, colors, icons, and informational dropdown menus. Clear, concise, and informative, these icons and pop-ups detail issues identified with various features of the page. Browsing the drop-down menu for explanations on each component, users can read to learn more about why each feature may have been flagged and its relevance to enhancing the accessibility of the page.

As is true for all automated evaluation tools, WAVE is not a replacement for user accessibility testing. Instead, an automated WAVE report can provide a preliminary guide for evaluators to easily identify major usability issues in the development process. WAVE cites its

main guidelines for identifying and evaluating accessibility errors to reflect WCAG standards and suggestions, organizing its recommendations into various categories.

WAVE-Identifiable Categories

1. Errors

These are issues that may impact certain users of the page and fail to meet WCAG standards.

They can include but are not limited to:

- Linked images missing alternative text
- Empty buttons without value text to describe their function
- Missing heading elements
- Empty links, devoid of text to describe the function of the link

Without the proper implementation of these features, individuals utilizing assistive technologies such as screen readers or relying on keyboard-only navigation will be unable to access the information being relayed.

2. Contrast Errors

Limited contrast between colors can inhibit easy reading for visually impaired and colorblind users. The size of text is also considered here, as larger text requires less color contrast than smaller text. The system highlights:

- Text that does not meet WCAG color contrast requirements
- Text that fails to meet contrast ratio guidelines as outlined by WCAG Level AAA (7:1 for normal text, 4.5:1 for normal text)

WAVE suggests manual testing is when transparency or background gradients are present.

3. Alerts

WAVE flags elements that might raise issues on a case-by-case basis as alerts to suggest further human evaluation. These may include:

- Unnecessarily long alternative text
- Redundant links and titles

4. Features

The “features” section is a positive callout, indicating features currently available on the site that improve accessibility when implemented correctly, such as:

- Alternative text for images
- The presence of form labels

5. Structural Elements

Structural elements show HTML and ARIA pages regions. These encompass features that increase ease of navigation for users with assistive technologies, facilitating ease of wayfinding:

- The presence of navigation elements such as banner landmarks
- Heading and footer page landmarks

6. ARIA

ARIA, or Accessible Rich Internet Applications, is a technical specification determined by the World Wide Web Consortium (W3). WAVE identifies present components of ARIA on the selected webpage including:

- Additional descriptions of present interface elements, such as form controls
- ARIA live regions, which can be used to inform users utilizing screen readers of important webpage content updates

Procedure

Using WAVE's various categories of identification as guidance, I created a unique point-based system to analyze and compare the accessibility of various Fortune 500 healthcare webpages. Based on WCAG specifications and WAVE callouts, I have identified the following accessibility attributes as the salient components of my applied ranking system:

1. Linked Images Missing Alternative Text (LIMAT)
2. Contrast Errors (CE)
3. Navigational Buttons Missing Alternative Text (NBMAT)
4. Navigational Links Without Text (NLWT)
5. Video or Audio Without Transcript (VAWT)
6. Missing Form Label (MFL)
7. Empty Link (EL)
8. Suspicious Alternative Text (SAT)

9. Empty Button (EB)

10. Language Missing or Invalid (LMI)

Based on my comprehensive literature review and extensive research on the various components of web accessibility, these features have been shown to be among those most essential to ensuring an equitable online experience. Without these alternative formats, assistive devices such as screen readers cannot properly guide users through a site. Especially for those who are visually impaired or hearing impaired, transcripts are essential to participating in and engaging with online content.

Each of the ten components are assigned 2 points for each instance the WAVE tool detects its presence on the page being tested. Hence, the webpage with the highest score (and therefore the greatest accumulation of accessibility roadblocks across all five areas) is deemed the least accessible.

Unit of Analysis

For the purposes of this study, I chose to analyze patient resource pages from some of the most prominent medical device and pharmaceutical companies across the healthcare industry.

Given the critical information conveyed on these patient-facing webpages, web accessibility should be a top priority. A lack of alternative text forms or inability to align with assistive devices can leave disabled users unable to obtain information about their upcoming

procedure or treatment. Ensuring patient resources are accessible to users of all abilities is key to fostering an equitable healthcare experience.

While the web pages reviewed in this study may have differed in area of focus, their purpose remained the same: to guide patients through educational materials to equip them with information regarding their diagnoses, upcoming medical procedures and more.

Accessibility Components	Boston Scientific	Stryker	Merck	Moderna	Bristol Meyers Squibb	Zimmer Biomet	Arthrex	Abbott	Regeneron	Johnson & Johnson
Linked Images Missing Alternative Text	0	0	0	0	1	15	2	1	0	0
Contrast Errors	0	0	0	1	3	6	4	3	0	0
Navigational Buttons Missing Alternative Text	0	0	0	0	0	0	0	0	0	0
Navigational Links Without Text	0	0	0	0	0	0	0	0	0	0
Video or Audio Without Transcript	0	0	0	0	0	0	0	0	0	0
Missing Form Label	0	1	0	0	0	0	0	3	0	0
Empty Link	0	1	0	0	0	0	0	0	3	0
Suspicious Alternative Text	0	0	0	0	0	0	0	0	0	0
Empty Button	0	0	1	0	1	0	0	1	2	0
Language Missing or Invalid	0	0	0	0	0	0	1	0	0	0
FINAL SCORE (2 points per instance)	0	4	2	2	10	42	14	16	10	0

Table 1. Comprehensive Results of Patient Resource Pages, Organized by Accessibility Feature

As indicated by the data table above and organized into the bar chart below, Zimmer Biomet's patient resource page ranked as the least accessible among the healthcare companies reviewed.

Lack of Web Accessibility Among Patient Resource Pages

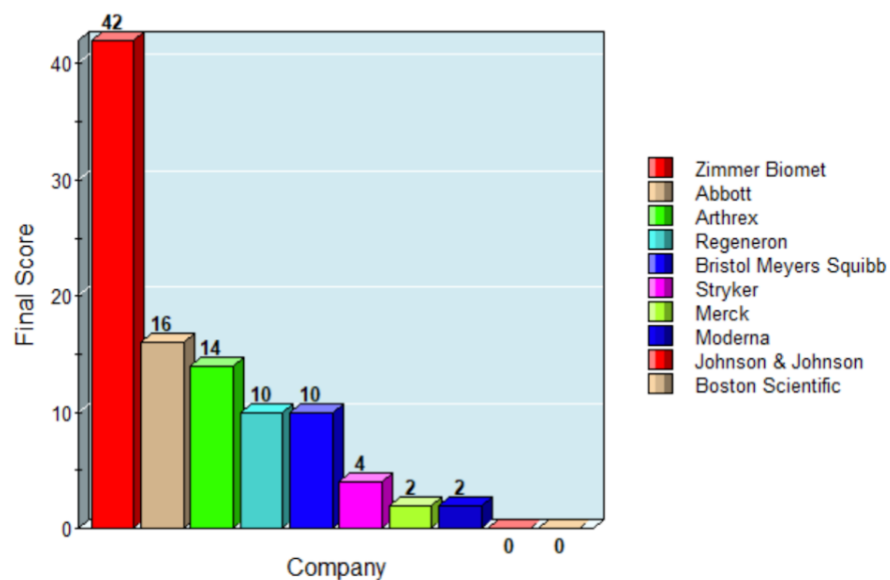


Figure 3. Comparative Analysis of Patient Resources by Respective Organizations

Other Meaningful Insights

Of all the components evaluated, Linked Images Missing Alternative Text and Contrast Errors occurred the most frequently across all companies. These two errors directly impact users who are visually impaired or deaf. Linked images that lack alternative text are not compatible for users with assistive technologies who rely on screen readers to describe images to them out loud. Contrast errors indicate a lack of color contrast in design choices that can make text and graphics difficult or impossible to read for users who are colorblind or visually impaired. These components are essential to creating an equitable navigational experience for users of varied abilities, and a lack of these features immediately creates a barrier to accessing vital patient resources.

Chapter 4

DISCUSSION OF FINDINGS

Practical Applications and Recommendations

For Corporations:

Identify Industry Leaders to Promote Corporate Social Responsibility (CSR)

This study concludes that both Boston Scientific and Johnson & Johnson are leaders in the web accessibility space. Both companies are publicly traded and are headquartered in the United States, providing a myriad of healthcare solutions including biomedical and biotechnological products and services. Their mutual emphasis on improving patient outcomes mirrors their attention to detail in the pursuit of an unequivocally equitable user experience. Patient resource pages evaluated from both companies for the purposes of this study universally met all required parameters to gauge accessibility. Their exemplary accessibility scores should serve as a beacon of proper web design to guide other large healthcare companies towards an ideal user experience. Delegating these two entities as innovative industry leaders will help promote corporate social responsibility among their peers and positively impact the patient experience.

Implement Internal Cross-Functional Committees

Following *National Federation of the Blind v. HRB Digital LLC. And HRB Tax Group (H&R Block)*, H&R Block took measures to amend their wrongdoings and ensure the needs of disabled users would not be overlooked again in the future. By appointing an internal cross-functional committee dedicated to evaluating and improving the accessibility of their websites

and digital tools, the company made lasting changes in their corporate structure to enhance accessibility. An internal corporate initiative such as this should be replicated by the companies evaluated in this research to keep constant innovation and improvement at the forefront of CSR conversations.

For Developers:

Evaluate and Suggest Improvements for Authoring Tools

Change comes from the ground up. Developers must be vocal about components their authoring tools may lack that can result in missing accessibility features. Identifying these oversights provides room for opportunity to enhance the ease with which developers can build out websites that are compatible with WCAG, ADA, and work seamlessly with assistive devices.

Developer Education Opportunities

Organizations such as W3 should use their platform and wealth of resources to campaign for greater web accessibility education in undergraduate and graduate computer science, software development, and IT programs. Accessibility should be a cornerstone of curricula, with one class or even perhaps a certificate program dedicated to signifying a demonstrated understanding of the legal, technical, and ethical dimensions of web accessibility.

Directions for Further Research

Developer Education and Authoring Tools

Understanding the relationship between developers and the authoring tools they use is essential to crafting meaningful solutions for increased web accessibility. Without knowledgeable developers properly educated on accessibility standards and features, companies cannot rely on the assumption that their websites will meet all WCAG and ADA guidelines. Secondly, should the authoring tools developers be equipped with fail to provide easy access to building shortcuts that enhance accessibility and enable the use of assistive technologies, the likelihood of an accessible website effectively decreases. Lack of easy-to-implement accessibility shortcuts requires developers to allocate extra time and effort to create their own workable solutions.

More research is needed to analyze the different types of accessibility features made easily available on authoring tool platforms. An analysis of how many authoring tools lack such features would provide better insight as to where new shortcuts can be implemented to increase ease of use for developers and keep accessibility top of mind.

Opportunities for Collaboration

While consortia such as W3 exist and work to promote increased web accessibility education and implementation, there is much room for growth in the healthcare space. This study

has concluded that significant amounts of online patient resources are not fully accessible or compatible with assistive technologies. For companies who work to serve patients and improve their quality of life, ensuring that their patient-facing pages are equally accessible to individuals of all abilities should be of paramount priority.

Bringing together entities such as the Federation of the Blind and W3 with companies such as Zimmer Biomet, Abbott, and Arthrex promotes open conversation and ensures inclusive decision making. Additionally, each organization has resources to share with one another, including the ability to gather real patients for user accessibility testing and focus groups. These organizations may send forth representatives to account for patient (user,) developer, and client perspectives. Establishing a channel of communication between these separate entities allows them to work in tandem, bringing together various stakeholders to innovate an optimal user experience.

Chapter 5

CONCLUSION

Web accessibility impacts everyone. Unnoticeable for some and detrimental for others, a lack of proper site infrastructure can be a discriminatory hurdle that bars individuals of varied abilities from actively participating in society. As the omnipresence of virtual engagement and reliance on mobile devices presents an obligatory technological literacy for users, it is essential that web accessibility components be placed at the forefront of web-building and updating efforts.

Time and time again, issues of web inequity have been highlighted in the legal sphere, including *National Federation of the Blind v. HRB Digital LLC. and HRB Tax Group (H&R Block)* and *National Federation of the Blind v. Target*. It has fallen upon independent organizations and equal rights groups to defend and amplify the voices of disabled plaintiffs in the fight against large corporations' lack of equitable resources. Increasing international web accessibility awareness in the pursuit of establishing stricter guidelines and legal implications is salient in ensuring a more equitable future where powerful corporate entities are held accountable.

Aside from moral and ethical motivations, businesses and organizations should promote web accessibility if for no other reason than to further their corporate social responsibility initiatives and establish good report with consumers. Exclusionary practices alienate audiences and encourage them to take their business elsewhere. By ensuring that all published digital

materials align with commonly accepted web accessibility standards, corporations can protect themselves from disenchanted consumers, negative press, and potential legal implications.

Developers are the builders of online experiences. Their knowledge and expertise can be the gateway to making the interfaces of virtual experiences accessible to users of all abilities. The relationship between developers and the authoring tools they have access to can significantly impact a site's compatibility with the assistive devices many users rely on to obtain information online. Ensuring that developers are properly educated on web accessibility standards and guidelines is key to identifying and improving authoring tools. Doing so will promote ease of use and encourage greater awareness and implementation of important accessibility components.

Among healthcare organizations, ensuring patient resources are accessible to all users should be a top priority. These webpages often contain pertinent information regarding health conditions, medications, procedures, and guidance towards other educational resources. Patients have the right to be informed about their medical care, regardless of any disabilities they may face.

In conclusion, it is essential that healthcare companies prioritize ensuring their patient resources align with and exceed web accessibility standards. After evaluating multiple elements of web accessibility including both user, developer, and corporate perspectives, it becomes clear that achieving an equitable web experience for all is far from a one-sided effort. Through education, awareness, and peer leadership, healthcare entities should collaborate with both developers and patients in the pursuit of an inclusive online experience for all.

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ACADEMIC VITAE

LAUREN CARLIN GROFF

[LinkedIn](#)

EDUCATION

THE PENNSYLVANIA STATE UNIVERSITY

May 2024 Graduation

Schreyer Honors College

Public Relations (B.A.)

Digital Media Trends and Analytics (Minor)

COMMUNICATIONS EXPERIENCE

Stryker

Communications Intern – Strategic & Marketing Communications Team

MAY – NOVEMBER 2023

- Developed comprehensive communications plan and digital toolkit to support enterprise-wide activation and launch of historic direct-to-patient campaign
- Transformed digitized data into actionable items for salesforce, build template to capture pilot program feedback
- Crafted strategic messaging, draft storyboard, and direct production of internal culture training educational video
- Researched, wrote, and produced unique content briefs for @strykeractive
- Supported digital marketing team with social media audit, content strategy and creation from ideation to deployment

Regan Communications – Pierce Coté

Public Relations Intern

MAY – AUGUST 2022

- Represented extensive portfolio of clients across various industries including environmental engineering, wildlife resource management, healthcare, entertainment, and local government
- Conducted competitive market analysis to implement comprehensive marketing and integrated communications plan, oversee client media training and event coordination, edit and revise value propositions

Downtown State College Improvement District

Public Relations Intern

JANUARY 2022- APRIL 2022

- Facilitated heightened community outreach programming and engagement following COVID-19 pandemic
- Increased Facebook reach by 216.9% and new page likes by 137.5%, leveraged data to optimize social media strategies

Amazon Prime

JANUARY 2021-MARCH 2022

Campus Brand Manager

- Evaluated data analytics to identify and access niche markets for Prime Student benefit programs
- Produced varied shortform multimedia content over a total of 11 months to audience of over 2,000

ESPN College Gameday

Remote Operations Intern

SEPTEMBER 2021

- Assisted Director of Remote Operations in overseeing organizational tasks to support live broadcast

Cape Cod Baseball League

Public Relations & Strategic Communications Intern

MAY – AUGUST 2021

- Spearheaded data analytics project to optimize social media strategies and impact regional advertising budget distribution
- Oversaw management of CCBL social media accounts with over 1 mil. engagements & 42,000 followers

LEADERSHIP

“Build Your Media Brand” Teaching Assistant

AUGUST – DECEMBER 2023

- Facilitated group discussions, supported keynote speaker presentations, reviewed materials and homework assignments for Dean Hardin’s professional development course

Bateman Case Competition

JANUARY 2023 – APRIL 2023

- Chosen to represent the Bellisario College in the annual Bateman Case Competition
- Crafted comprehensive media plan for client, News Literacy Project, and executed at University Park campus to raise awareness of misinformation among online news sources

Bellisario Fellows Program

MARCH 2022 - PRESENT

- Selected to serve as peer mentor and spokesperson for alumni, prospective students, and key stakeholders of the College

Penn State Presidential Leadership Academy

MAY 2021- PRESENT

- Engage in solution-oriented problem solving in a think-tank environment through 7-credit leadership development curriculum instructed by Dean Mather of Schreyer Honors College

PROFICIENCIES & CERTIFICATIONS: Excel, PowerPoint, SharePoint, Adobe Suite, Google Suite, Microsoft Office – Expert, Google Analytics Individual Qualification certificate, Marketo