

A 360° Approach to Accessibility Testing

Why a Consistent Methodology is Critical in Accessibility Testing

One of the biggest challenges in addressing website accessibility is the fact that your company's digital presence is constantly growing and changing. Taking the necessary steps to ensure a website is accessible is a large undertaking, and ensuring that it stays accessible over time is an ongoing process. Only by accurately testing your site can you continue to address accessibility issues or problems. But what is the best way to carry out accessibility testing to ensure accurate and actionable results? The key to successful accessibility testing is using a consistent approach or methodology. A comprehensive, thoughtful process that maximizes the outcome makes all the difference to ensure your website and applications are accessible to all users, regardless of physical ability.

Which brings us to 360° web testing: the approach that Deque advocates for obtaining the most detailed and accurate sense of a site's accessibility.

The 360 Degree approach to a website that we will be discussing includes:

- 1) Using automated testing software to test a wide breadth of pages, perform thorough testing, and to test various user inputs.
- 2) Using manual testing for use cases and areas of the WCAG standard where having a human review and understand the context and nuance of particular issues is useful.
- 3) Ensuring that testing includes users with disabilities who actively use assistive technology.



Automated Testing as Part of Your 360° Approach to Web Testing

How do you test for web accessibility? Whether you are testing for WCAG 2.0, 508, or any of the other accessibility standards used internationally, you will benefit from using a mix of manual and automated testing techniques, applied regularly and consistently.

While manual testing can yield detailed and accurate results, the cost of this method is high, and the shelf life of the testing results can be extraordinarily short.

On average, experienced web accessibility experts conducting manual tests spend anywhere from 1–3 hours doing a thorough examination of a page for violations of WCAG 2.0. Factors that affect the length of the review include complexity of the page, number of violations on that page, requests to identify every single violation on every page, and misleading browser and assistive technology bugs. In addition to discovering each issue, the expert is often asked to clearly explain, in writing, exactly where the problem is located and how to resolve it.

Now imagine a project where the objective is to manually review 100 pages on a specific site. The client has a modern, dynamic and interactive site that is updated regularly with new content. The release cycle for infrastructure changes to the site is based on an agile timeline, so changes to the underlying template and code happen as frequently as every 4 weeks.

- Approximate hours for manual accessibility review for 100 pages = 100-300 hours
- Potential shelf life of that review – 4 weeks

Clearly this approach is not feasible for most organizations.

So, how do you balance practicality with accuracy? The smart solution is to use automated accessibility scans to monitor the breadth and depth of your site(s), coupled with focused manual testing on key representative pages. In other words, use the power of automation as a proactive warning system and use manual testing to confirm that key users paths are truly accessible.

What is the right mix of manual testing (high touch) and automated testing (high tech)? Based on our experience, the most effective and efficient use of your resources is to employ the 80/20 rule. 80% of your testing effort should be automated and 20% should be manual. We recommend monthly, automated scans for unambiguous or explicit accessibility issues. These smart scans will alert you if accessibility testing was skipped during development, or if obviously inaccessible third party content was added.

What are the top 5 explicit accessibility issues that can be identified with an automated scan?

Accessibility Issue	WCAG 2.0 Success Criteria	508 Paragraph
Images missing alt attributes	1.1.1	(a)
Active images with a null alt attribute	1.1.1	(a)
Form fields missing explicit labels and/or titles	1.1.1	(n)
No title on a web page	2.4.2	(k)
No primary language specified for the web page	3.1.1	Not Applicable

Running a monthly scan across your site to identify explicit accessibility issues is one of the very best methods for detecting accessibility problems when you have limited resources. These monthly scans will help you get your head turned in the right direction so you can focus your detailed manual testing efforts in the smartest way possible. An approach that combines robust automated testing with select manual testing is an approach that is practical and realistic for organizations to implement.

Remember, what gets measured gets done. If you don't monitor the accessibility health of a web site on an ongoing basis, it will decay.

Manual Accessibility Testing as Part of Your 360° Approach to Web Testing

Automated accessibility testing is an integral part of your 360° approach to accessibility testing, but there are some issues that require manual testing. To get a truly comprehensive testing process, you have got to bite the bullet and experience the page with:

- A screen reader
- Speakers and microphone off
- No mouse

You will need to run three test cycles: one with “no sight,” one with “no sound,” and one with “no mouse.” If you don’t conduct this type of usability testing during the web development process, people with disabilities in the real world become the usability testers. And that is a recipe for unhappy users and lost customers.

A Practical Accessibility Testing Plan

In our experience as website accessibility consultants for large clients, we have developed the following practical accessibility testing plan as a way to monitor a site with over a million pages maintained by over a thousand web developers and content contributors:

- Comprehensive Testing
 - High Tech
 - Enterprise Accessibility Scans
- Representative Pages
 - High Touch + High Tech
 - Page by Page Testing Tools
 - High Touch
 - Expert Functionality Testing
 - Screen Reader
 - No Sound
 - Keyboard Only
- Key User Paths
 - High Touch
 - Usability testing with people who have disabilities

Where to Focus Your Energy

None of us have the resources to conduct comprehensive manual accessibility testing on every page of our site(s). Even if we did have the resources to do this, the moment we finished the test, we'd have to start all over again, because our sites are constantly changing. So, the smartest way to leverage your manual testing is to focus on the following types of pages:

- Site-wide Templates
- Representative Pages that include
 - Informational Images
 - Active Images
 - Forms
 - Data Tables
 - Multimedia
 - Dynamic Pages
 - Modal Windows
 - Color
 - Timers
 - Different Languages
 - Critical Pages
 - Key Entry Points
 - Key User Paths
 - Highest Traffic Pages
 - The Obvious
 - Feedback Form
 - Accessibility Policy Pages

As you develop your list of representative pages for manual accessibility testing, keep these additional factors in mind:

- Audience for this Page
- Impact of Not Having Access to the Information / Functionality on this Page

One final consideration when reviewing the list of representative pages is to imagine you are talking to a disabled user. Picture yourself explaining how you used automated testing to proactively look for problems and used focus manual testing to make sure that key user paths were truly accessible to people with disabilities. Will the user see that you really cared about equal access and did everything within your power to make progress and maintain accessibility?

Focused Hands-on Accessibility Testing and WCAG 2.0

Once you have selected the representative pages you will test manually, you need to make sure you have a comprehensive, consistent testing methodology that is effective and efficient. Here at Deque, we have analyzed the 38 individual WCAG 2.0 AA success criteria and determined that the following checkpoints must be manually verified as follows:

WCAG 2.0 AA Success Criteria	Keyboard-Only Testing Required	No-Sound Testing Required	Screen Reader Tester Required
1.2.1 Transcript		X	
1.2.2 Captions (prerecorded)		X	
1.2.3 Captions (live)		X	
1.3.3 Sensory		X	
1.4.2 Audio Control	X		X
2.1.1 Keyboard	X		X
2.1.2 No Keyboard Trap	X		X
2.2.1 Timing Adjustable	X		X
2.2.2 Pause, Stop, Hide	X		X
2.4.3 Focus Order	X		X
2.4.7 Focus Visible	X		
3.2.1 On Focus	X		X
3.2.2 On Input	X		X
3.3.1 Error Identification	X		
3.3.1 Error Identification			X
3.3.2 Labels or Instruction	X		X
3.3.4 Error Prevention	X		X

Note the overlap between the twelve success criteria that must be verified by keyboard alone and the eleven success criteria that must be verified by screenreader testing. The only difference between the two is for keyboard only testing you need to test for 2.4.7 Focus Visible, while this test

is not critical for screen reader users. It is important to keep in mind that screen reader testing is not identical to testing with keyboard alone.

Remember, that sighted people with manual dexterity disabilities that cannot use a mouse are not likely to be using a screen reader. Powerful features in modern screen readers certainly help people with visual disabilities, but we can't lose sight of accessibility issues that cause barriers for keyboard only users.

Remembering Why

As you are considering your strategy for manual and automated accessibility testing, remember to keep the core purpose in mind. The goal is to remove barriers on the web so that all people, regardless of disabilities, can obtain the same information and perform the same functions. So, every time you can honestly report “no sight, no sound, no mouse: no problem!”, know that you have played a part in building a web for all.



Putting it all together: Deque's 360 Degree Accessibility Testing Methodology in Action

So far, we've talked about the two main methodologies that Deque uses to perform accessibility testing: automated testing, using Deque's WorldSpace platform, and manual testing to provide depth and focus of expertise where it's needed.

While both methodologies are important, it's how they are used together that makes the difference. Let's walk through a fictionalized case study of a client we'll call Fiction Bank. While our illustration uses a financial institution as the organization doing the testing, it could be any company, government agency, or educational institution that could use and benefit from this approach.

Fiction Bank has a problem. They have received a complaint about the accessibility of their site via a state regulator. The single problem has raised the issue of how accessible their site is overall and the need to comply with the ADA to ensure all web users, and particularly people with disabilities, can use the site without barriers.

Before engaging in automated or manual testing, some important organizational work needs to be accomplished up front:

- 1) A list of all the "transaction paths" (user tasks and the clicks required to accomplish them) needs to be created. In the case of Fiction Bank, example transaction paths would include logging into their account, checking their account balance, paying a bill, and contacting customer support. It's not uncommon for the list of transaction paths to be quite long, depending on the size and sophistication of the web application that's being evaluated.
- 2) The transaction paths are then prioritized, based on their popularity as reflected in usage logs, and based on the level of importance as core functionality as defined by the business. The ranking of the transaction paths helps to ensure that the most important and heavily used features have appropriate urgency and the resources assigned to them. For Fiction Bank,

contacting customer service by email or via an online form was prioritized higher than contacting customer support by fax, a feature that the product team indicated was seldom used.

Accomplishing items #1 and #2 create the start of an action plan. The team knows what the most important areas of the site are to review first and what has less urgency.

At this point, the portfolio of transaction paths can be used to design a testing plan that allows the team to take a complete 360° approach and draw on the strengths that automated and manual testing offers.

For Fiction Bank, the combined high priority transaction paths totaled several hundred thousand pages. Clearly, to conduct manual review of those pages would have taken a great deal of time and an unrealistic budget. So, in this case, automated testing can help ensure that the breadth of pages receives the attention that it needs.

Additionally, a number of the transaction paths are data-driven (i.e. the pages render differently based on the selections and input the customer makes). Different states, for example, have different regulations regarding credit cards; so which state the user selects impacts the content that they see. Testing 50 state permutations would be time consuming and costly using manual testing, but WorldSpace allows customer data entry to be scripted and played back during testing, achieving efficiency and scale.

There were some areas where manual testing was important. For example, Fiction Bank had several pages with complex tables that compared the financial products they offered. Automated testing could accomplish a high level sense of the level of accessibility, but manually testing these pages to ensure a screen reader user could navigate the information successfully provided a more conclusive and thorough outcome.

Taken together, manual and automated testing combined within a testing plan that identifies and prioritizes transaction paths provides a complete, 360° view of the level of accessibility of the site. Because it draws on the strengths of both testing approaches, Deque has found it provides the most cost-effective and thorough results.

Contact Deque to Learn More

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