deque

DevOps and Accessibility

Dylan Barrell, Chief Product Officer

Deque

Founded: 1999

Mission: Digital Equality

Focus: To achieve sustainable accessible software development through the application of tools and processes

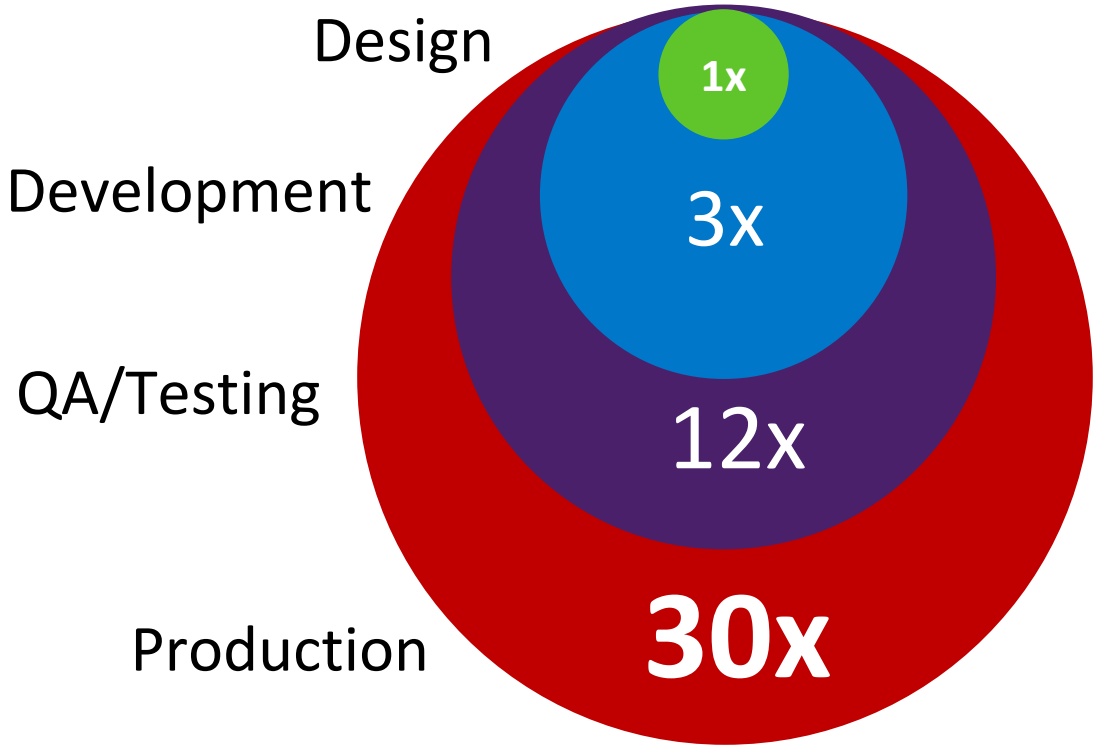
Technologies: axe® suite of tools for automating accessibility testing

Value to the business

- **Increase revenue:** 73% of Americans are influenced by accessibility
- **Lower cost:** Digital sales channels cost far less to run than physical
- **Avoid risk:** Lawsuits and brand damage

What about value to development?

Value in DevOps: Where you find and fix issues matters

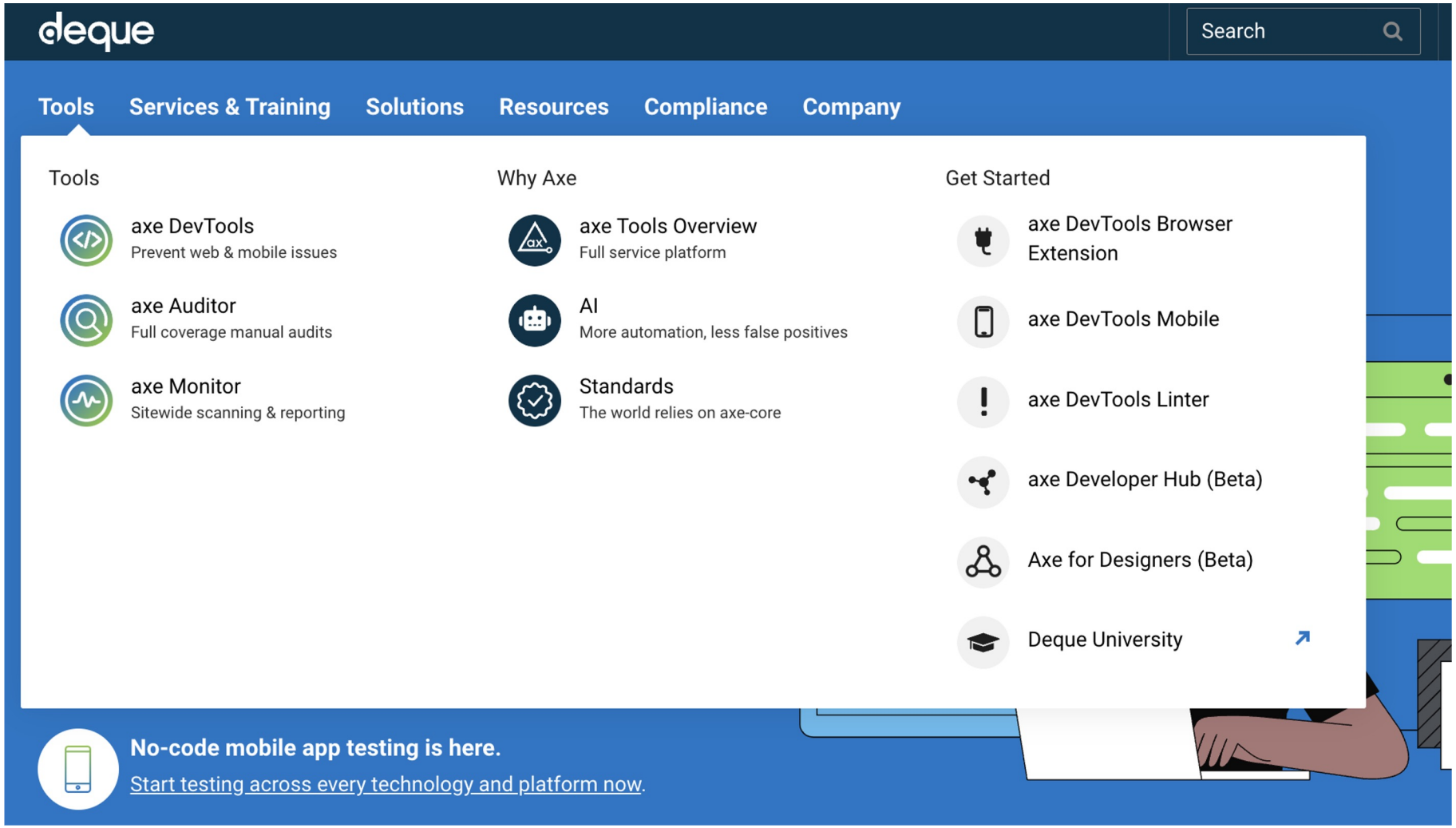


What is WCAG?

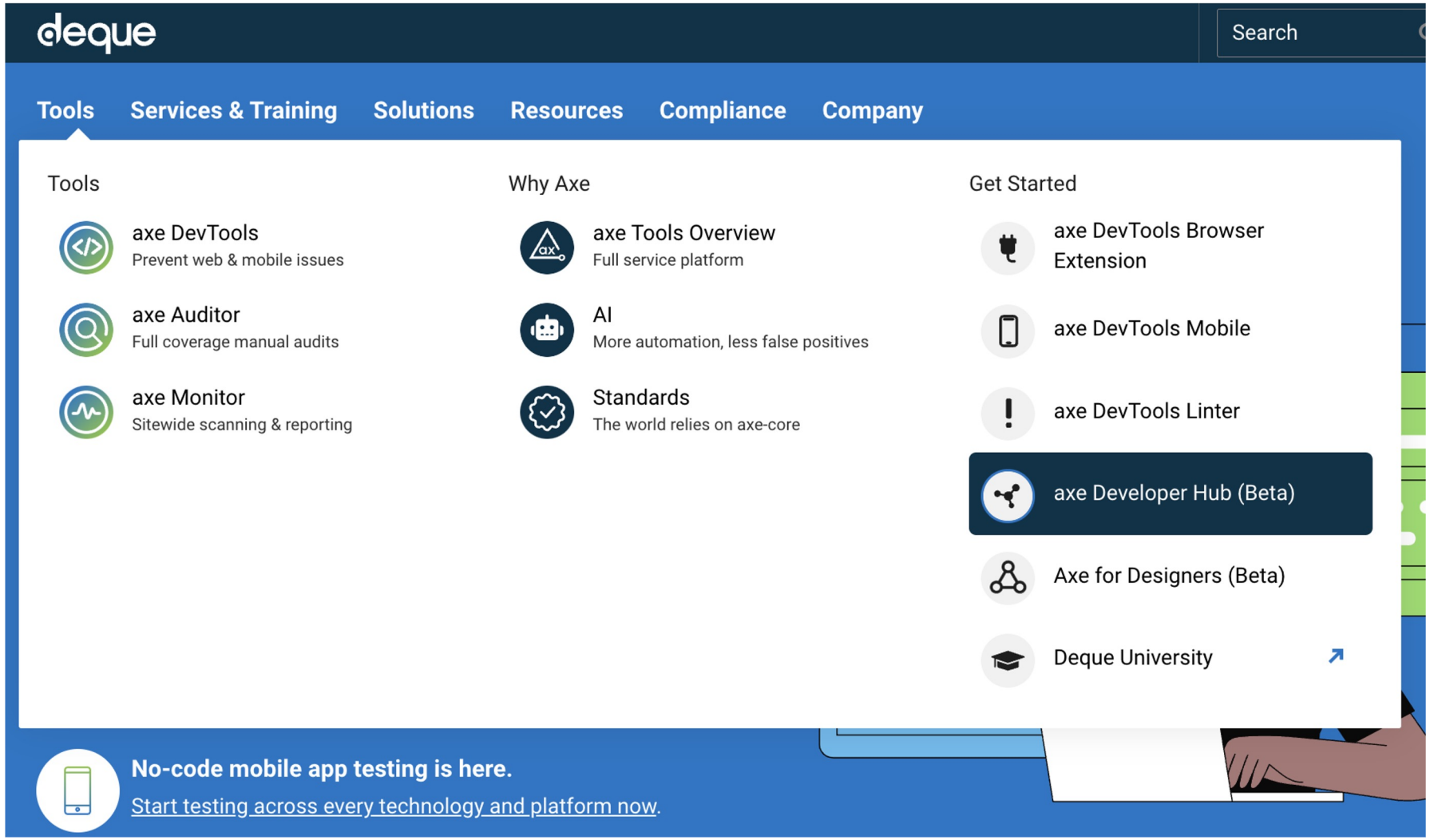
- Web Content Accessibility Guidelines
- 1.0 published May 1999
- 2.0 published December 2008
  - 2.1 June 2018
  - 2.2 currently in final draft
- WAI-ARIA 1.0 published March 2014
  - added semantics that were/are not available in HTML
- Four principles
  - Perceivable
  - Operable
  - Understandable
  - Robust

Perceivable Example

Operable Example



Operable Example



Some interesting statistics

- 50 success criteria (SC) in WCAG 2.1 A and AA
- Just 3 account for ~60% of defects
- 6 for ~80% of defects
- **Only 15 success criteria account for ~95% of all defects**

https://www.deque.com/automated-accessibility-testing-coverage/

Table 1: WCAG Success Criteria with the Most Issues

#	Success Criteria #	Success Criteria Name	Total issues	Manual issues	Auto issues	Manual %	Auto %	% of ALL Issues by SC	Cumulative % of Issues
1	1.4.3	Contrast (Minimum)	88,714	14,981	73,733	16.89%	83.11%	30.08%	30.08%
2	4.1.2	Name, Role, Value	48,287	22,011	26,276	45.58%	54.42%	16.37%	46.45%
3	1.3.1	Info and Relationships	36,382	19,950	16,432	54.83%	45.17%	12.33%	58.78%
4	4.1.1	Parsing	34,488	3,351	31137	9.72%	90.28%	11.69%	70.47%
5	1.1.1	Non-text Content	23,701	7,687	16,014	32.43%	67.57%	8.04%	78.51%
6	2.4.3	Focus Order	9,553	9,553	0	100.00%	0.00%	3.24%	81.75%
7	2.1.1	Keyboard	9,412	9,178	234	97.51%	2.49%	3.19%	84.94%
8	2.4.7	Focus Visible	7,312	7,312	0	100.00%	0.00%	2.48%	87.42%
9	1.4.11	Non-text Contrast	4,539	4,539	0	100.00%	0.00%	1.54%	88.96%
10	1.4.1	Use of Color	3,713	3,261	452	87.83%	12.17%	1.26%	90.22%
11	1.3.2	Meaningful Sequence	3,313	3,313	0	100.00%	0.00%	1.12%	91.34%
12	3.3.2	Labels or Instructions	2,537	2,019	518	79.58%	20.42%	0.86%	92.20%
13	2.4.1	Bypass Blocks	2,533	532	2,001	21.00%	79.00%	0.86%	93.06%
14	2.4.2	Page Titled	2,211	1,962	249	88.74%	11.26%	0.75%	93.81%
15	3.1.1	Language of Page	2,173	178	1,995	8.19%	91.81%	0.74%	94.54%
	#.#.#	Rest of WCAG 2.1 A/AA SC	16,090	15,889	201	98.75%	1.25%	5.46%	100.00%
		Totals	294,958	125,716	169,242	42.62%	57.38%		

What tools can help

- axe for Designers - Figma plugin for testing designs and communicating design intent
- axe DevTools Linter - integrate into IDE and CI/CD to find accessibility issues while coding
- axe Developer Hub - no code leveraging of e2e tests for accessibility

DevOps and Accessibility

A Case Study of USAA's Success

Steven Rambach
Senior Software Engineer

THE USAA WAY

OUR MISSION

is to empower our members to achieve financial security through highly competitive products, exceptional service and trusted advice. We seek to be the #1 choice for the military community and their families.

OUR CORE VALUES

Service. Loyalty. Honesty. Integrity.

OUR BEHAVIORS

We take ownership.

We strive for excellence.

We foster belonging.

OUR PERFORMANCE STANDARDS

Exceptional Service Team for members.

Winning Financial Strength for employees.

Community Impact for the association. for external stakeholders.

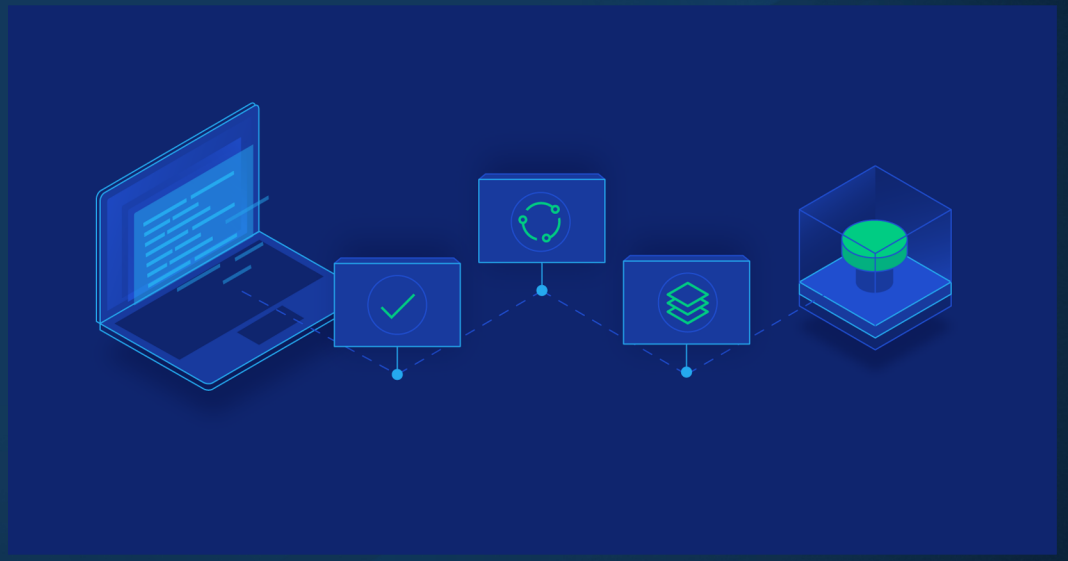
OPERATING WITHIN RISK APPETITE

Accessibility in the past

- Manual consultation
- Limited hands-on manual tooling
- Manual testing attestation
- WCAG version mismatches

Transitioning to CI environments

- Streamlining & automating
  - Code review and deploy
  - Vulnerability management
  - Automated testing
    - Unit/Integration/Functional
    - Security
    - Performance
    - *Accessibility*
  - Automated test evidencing
  - …



Generic diagram for CI things

https://www.toptal.com/devops/effective-ci-cd-deployment-pipeline

How can USAA integrate accessibility testing?

- Minimal developer disruption
- Hands-off evidencing

Generic stock image of guy thinking

Accessibility in CI – Strategy

- Minimal developer impact
  - Utilize pre-existing tests
  - DOM readily available
- Evidence testing
  - Test xml's already supported

Accessibility in CI – Execution

- One-line page scan
  - No new tests
  - No new frameworks
  - One-time setup
  - No new executions
- Export and evidence accessibility testing findings
  - Leverage existing test publishing

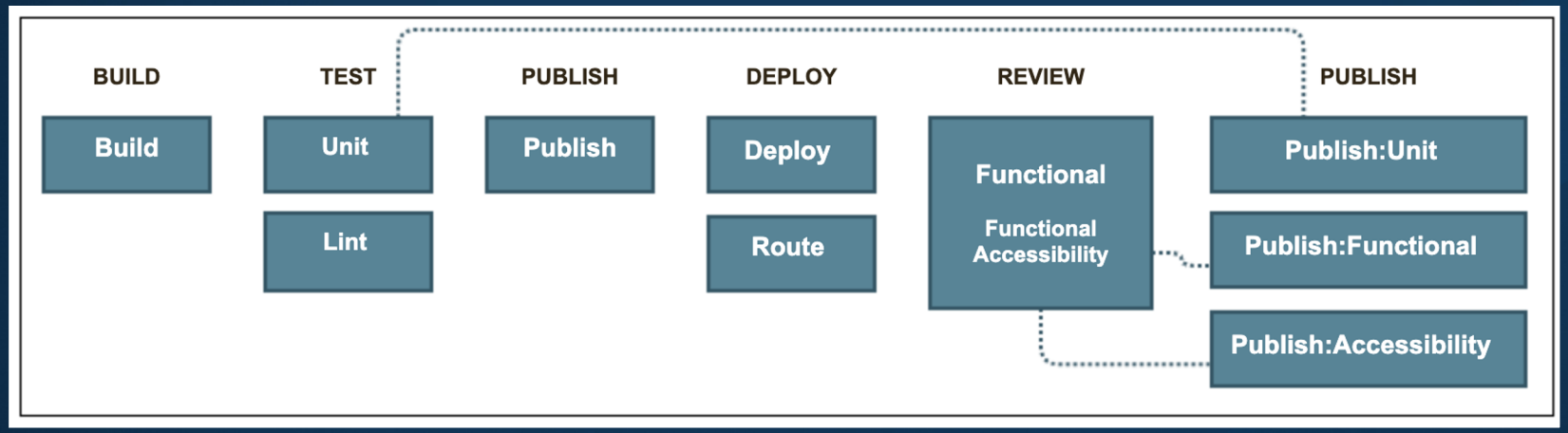
Accessibility in CI – Execution

```
it('should click a link', async () => {

  await $('=Standard Template').click();
  expect(await browser.getTitle()).toContain('Standard Template’);
  //Scans the current page state for accessibility issues
  await browser.axeAnalyze('homepage’);

});
```

Accessibility in CI – Execution



What have we solved?

- Accessibility scans are now automated in a CI setting
  - Minimal code change
  - No extra tests required
- Evidencing of scans is present, and automated

What's next?

- Expand automated testing past WCAG coverage
- Detect issues earlier than code builds
  - Linters
  - Design stages
- Streamline WCAG scans even further
  - One line of code is great, but what about zero?