Automated Testing of Digital Accessibility – The Productivity Challenge

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Presenters

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Presenters

Ernesto Alonso

Technical Lead at A11ySolutions | Computer Engineer
Computer Engineer with over 5 years of experience in digital accessibility. Proven expertise in evaluating accessibility compliance and implementing inclusive solutions from the early design stages through to development and deployment.

Member of the International Association of Accessibility Professionals (IAAP).

Jose Rodriguez

Technical Leader at A11ySolutions | Computer Scientist
Computer Scientist with over 5 years of experience designing and implementing software solutions that simplify the development and maintenance of accessible digital products.

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Agenda Overview

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3 Key Challenges in Scaling Audits

4 Breaking the scalability barrier with Automation

5 Remediation Solution: A11iBot

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8 Impact Metrics and Testimonials
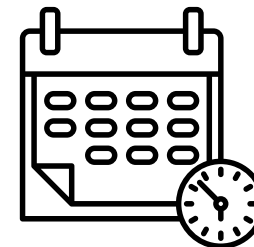
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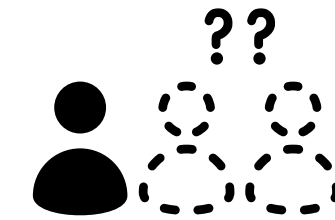# Problem: The Scalability Challenge in Accessibility

Challenge

- **Limited** supply of **qualified a11y experts**.
- **High costs**.
- Long training timelines: **12–18 months**.
- Industry-wide **shortage**.

Current Reality

- Handling **15+ active projects** per day.
- **35%** projected **growth** in the next 12 months.

Critical Need

- **Must double the expert team rapidly,** traditional 12-18 months training isn't viable.

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Scalability Barriers: Two Major Challenges

Scaling with demand

Challenge:
More clients ⟶ More audits ⟶ Limited experts

Consequences:
Delays ⟶ Higher costs ⟶ Client risk

Accelerating Onboarding

Challenge:
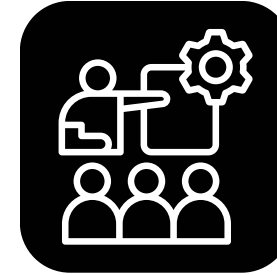Junior auditors take a long time to become fully trained and productive.

Consequences:
Senior overload ⟶ bottlenecks ⟶ Limits scale

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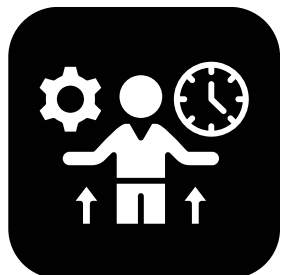# Breaking the scalability barrier with Automation

Augments Expert Capacity

Automated tools handle repetitive, high-volume tasks, freeing experts to focus on what truly requires human judgment.

Accelerates Onboarding

AI-assisted interfaces enable junior auditors to contribute meaningfully from day one, reducing the traditional 12–18 month ramp-up.

Boosts Productivity

Experts can concentrate on complex WCAG interpretations, screen reader testing, and strategic compliance, enhancing overall audit quality.

Scalable & Sustainable

With automation in place, accessibility audits become more consistent, faster to deliver, and capable of meeting growing market demand.

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Remediation Solution: A11iBot

A11iBot is our consolidated complementary tool, designed to receive issues detected by A11yDetector and convert them into immediate remediation instructions.

Advanced Automation

Powered by AI models and specific algorithms, it handles most repetitive tasks, such as ARIA attribute validation, contrast adjustment, and focus order management.

Issue-Based Processing

- Identification of the applicable WCAG criterion (e.g., 1.4.3 Contrast Minimum) and association with the official technique.
- Classification of the type of element (button, link, form, table, etc.).
- HTML/ARIA analysis to detect missing or incorrect markup.

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Live Demo: Workflow and Demonstration

1

Running A11yDetector

Automatic generation of a list of accessibility issues.

2

Sending Issues to A11iBot

Via a browser extension.

3

Detailed Response

- Clear description of the issue.
- Corrected code (HTML / CSS / ARIA).
- Reference to the applicable. WCAG checkpoint and link to the official technique.

🔗 **A11yDetector - Demo Video**

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Impact to Date

Development Stage: Alpha Internal, validated by both, senior experts and junior auditors.

WCAG 2.2 Checkpoints Partially Covered

WCAG SUCCESS CRITERION	COVERAGE
2.1.1 Keyboard (Level A)	Partially covered
2.4.3 Focus Order (Level A)	Partially covered
2.4.7 Focus Visible (Level AA)	Partially covered
1.4.3 Contrast (Minimum) (Level AA)	Partially covered

Preliminary results

30% **Reduction in time** spent on routine checks.

25% **Decrease** in **manual reporting** errors.

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Impact Metrics and Testimonials

Laura Esther Lam Ruano
Mar 25, 2025

"With A11yDetector, we can focus on critical analysis rather than repetitive tasks. It gives us confidence when addressing advanced scenarios."

Yanay Hernandez Sosa
Apr 25, 2025

"Thanks to A11yDetector, I can identify and fix issues in minutes. My reports are now clearer and require fewer revisions."

Senior Experts

- Audit **speed increased by 30%**.
- Manual **errors reduced by 25%**.
- Average **time savings** of **2 hours** per audit.
- Increased confidence in complex cases thanks to instant validation by A11yDetector.

Junior Auditors

- **Learning curve** for checkpoints **reduced by 20%–30%**.
- **Issue reporting improved by 20%–30%** in accuracy and clarity.
- **Real-time practical training**: Each suggestion includes an educational explanation of the related WCAG technique.

Results

No.	URLs	Total bugs	Detected	False Positives	Precision	Coverage
1	https://www.universitiesnz.ac.nz/universities	41	40	1	98%	98%
2	https://sparktoro.com/	6	5	0	100%	83%
3	https://www.smartpassiveincome.com/	47	47	1	98%	98%
4	https://maestrosdehojiblanca.es/	97	92	1	99%	96%
5	https://usainbolt.com/	34	34	0	100%	100%
6	https://lboutique.es/	307	306	3	99%	99%
7	https://accessiblyapp.com/	20	16	0	100%	80%
8	https://www.constructors.com.au/	71	71	0	100%	100%
9	https://www.coe.int/en/web/portal/home	61	54	4	93%	82%
10	https://www.garyvaynerchuk.com/	56	37	4	97%	59%
Total average for All URLs					**98.40%**	**89.50%**

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Results

Robust Bug Detection Performance

- The system demonstrates high precision, averaging 98.4% across all URLs, indicating strong accuracy and a minimal rate of false positives.
- It also achieves an average coverage of 89.5%, effectively identifying the majority of existing issues across tested pages.

Scalable Detection Aligned with Page Complexity

- The positive correlation observed between total and detected bugs indicates that the system's detection capabilities scale effectively as the number of issues increases.
- The tool consistently identifies more issues on pages with higher bug density, reinforcing its reliability in more complex scenarios.

Consistently Low False Positive Rate

- The "False Positives" confirms the system's high precision. This consistency highlights the tool's reliability and accuracy in distinguishing true accessibility issues.
- A small number of URLs show slightly higher counts (3–4), which provides valuable opportunities for targeted refinement and continuous improvement.

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Conclusions and Further work

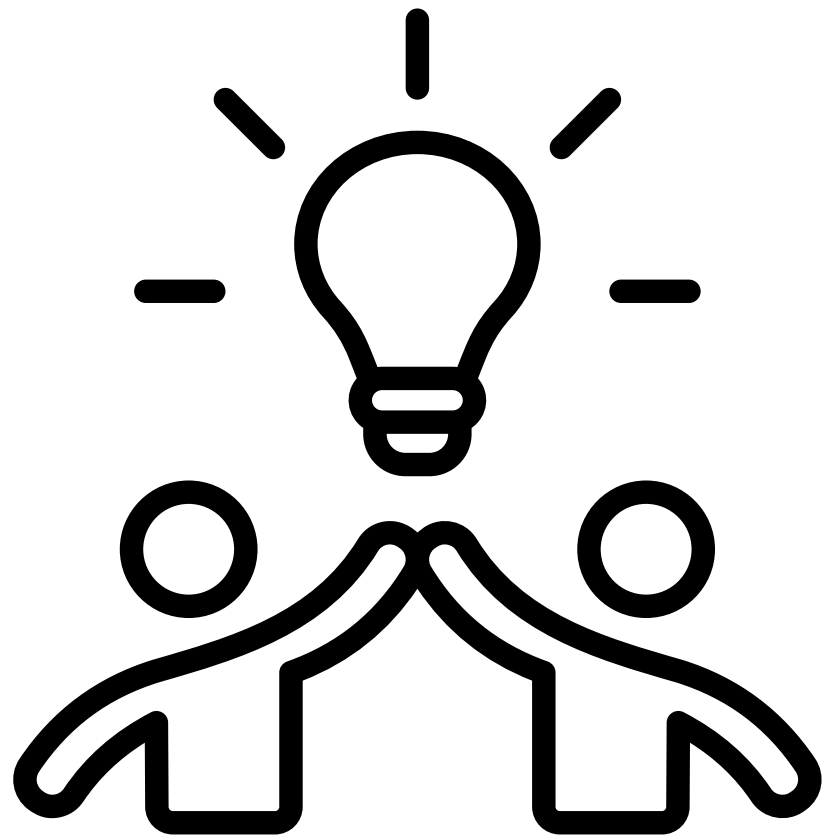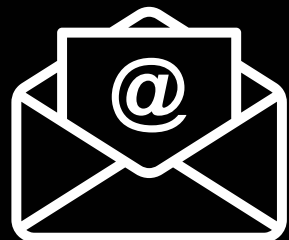| Conclusions	Further work
Human-in-the-loop tools help us significantly **increase the productivity** of our accessibility experts.	• Enhance the user experience based on feedback from our expert auditors.
Our in-development tool has achieved an average of **98.4% precision** and **89.5% coverage across the WCAG 2.2 checkpoints** implemented so far.	• Expand coverage to additional WCAG 2.2 checkpoints.
Beyond error detection, the tool also provides **suggested solutions**, **user impact**, **steps to reproduce**, and more, enriching the quality of audit results.	• Improve integration into our experts' existing workflow for smoother adoption and efficiency.

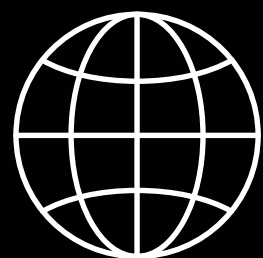A11YSOLUTIONS

Q&A Discussion

Let's Talk Accessibility

- Open floor for audience questions and feedback.
- Optional group discussion on shared productivity challenges in accessibility work.
- Exchange of ideas to inspire future enhancements or partnerships.

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Thank you!

If you're ready to be part of the solution, let's connect and make digital inclusion scalable, one audit at a time.