Towards a sustainable web accessibility

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Goals of this talk

1. To draw a roadmap for sustainable accessibility
2. To argue that we need
   - operative models of accessibility
   - 3 specific processes
Sustainable Accessibility

The problem is
Defining and establishing accessibility processes that can be sustained mainly by their own return on investment as a step towards:

Accessibility Engineering
a systematic, disciplined, quantifiable approach to the development and analysis of accessible web applications
Sustainable Accessibility

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Three Obstacles

Sustainable Accessibility is hindered by

1. Confusion regarding accessibility and how to investigate it
2. Complexity of conformance
3. Paradox of the Return on Investment
1. Confusion: Target.com case

1. Confusion on conformance vs success levels
2. Conflicting results based on different methods: conformance tests and subjective assessments
3. Ambiguity about which pages to test
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1. 3-tiers WAI model: conformance depends on WCAG+ATAG+UAAG; authors have no control
2. Missing link b/w conformance and accessibility
3. Unreliable/invalid ways to rate severity of problems
4. Reliability of conformance based on WCAG20 is unknown
5. Universal Design may be a hindering legacy
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3. The problem with the ROI

Accessibility leads to

1. Large effects for few users
2. Small effects for the vast majority of users

Hence:

1. Accessibility is difficult to measure reliably
2. It’s even more difficult to monetize its advantages
3. The problem with the ROI

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Necessary conditions for Sustainable Accessibility

1. Implementation of accessibility has to make a difference to users
2. Assessment processes have to be effective and efficient
3. Agile design methods are needed
The PCP Accessibility Model I

- can go beyond conformance
- aims at maximizing accessibility through specificity
- supports lightweight processes
The PCP Accessibility Model II

- accessibility model
- includes
- context
- properties
- processes
The PCP Accessibility Model III

- properties
  - describe
  - which parameters to include

- accessibility model
  - includes
    - context

- processes
  - what do we consider accessibility to be?
The PCP Accessibility Model IV

- **Accessibility model** includes **context**
  - May include **properties** describe
  - Which factors influence accessibility?
    - Type of disability
    - Experience level in Internet, assistive technology, website, domain
    - Short term user goals
    - Physical environment
    - Input/output devices

- Which parameters to include
  - What do we consider accessibility to be?
The PCP Accessibility Model V

- The accessibility model includes context, which describes properties that need to be considered. The context may include factors that influence accessibility.
  - Factors include:
    - Type of disability
    - Experience level in Internet, assistive technology, website, domain
    - Short term user goals
    - Physical environment
    - Input/output devices

- Processes include elicitation, measurement, and sampling.

Towards a sustainable web accessibility
Example of Properties

Which definition of accessibility?
(J. Slatin and S. Rush, 2003) and Section 508

A web site is accessible if disabled people can use it with the same effectiveness as non-disabled people.
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A web site is accessible if disabled people can use it with the same effectiveness as non-disabled people.
Example of Context

Which factors influence accessibility?

- type of disability
- experience level in Internet, w/ browser, w/ AT, in the domain
- short-term user goals
- interaction modality/devices
Evaluation Processes

- **Website**
  - sampling process
  - sampled pages
  - elicitation process
  - failure modes
  - accessibility levels
  - measurement process

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Example: Barrier Walkthrough

- analytical method
- based on barriers (ako "vulnerability points")
- forces evaluators to define a context
- helps them in rating severity=$f(\text{impact, persistence})$

(Brajnik, ICCHP 2007; ASSETS 2008)

Example: SAMBA

- method for measuring accessibility (not conformance!)
- combines results from tools with human judgment
- flexible wrt types of disabilities
- robust wrt sampling inaccuracies, tools inaccuracies, judges subjectivity

(Brajnik, Lomuscio: ASSETS 2007; IWWUA 2008)
Evaluating Accessibility Evaluation Methods?

- **efficiency**
  - based on
  - resources expended (time, skills, people, infrastructure) to reach a given level of effectiveness

- **effectiveness**
  - based on
  - validity
  - correctness
  - sensitivity
  - how many of the true problems are found
  - how many of the found problems are true

- **usability of the method**
  - based on
  - reliability
  - how easily can be learned?
  - managed?
  - how reproducible are the results when evaluators/participants change

- **usefulness** (suitability of results to stakeholders)
  - based on
  - suitability of results to report readers
Agile development methods and tools

1. centered on rapid prototyping
2. capable of modeling content types
   ▶ landmarks and directions
   ▶ interest info
   ▶ access mechanisms
   ▶ input data
3. capable of prototyping in different media/modalities
   ▶ to ensure that the same content is rendered regardless of chosen media/modality
   ▶ regardless of transformations that are inherent in accessibility:
      1. inter-media
      2. intra-media
      3. temporal
      4. de-contextualization
      5. linearization
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Open questions/research agenda

1. Develop a sound evaluation framework for AEMs
2. Develop/refine new AEMs and/or accessibility models
3. Compare analytical and empirical methods
4. Effects need to be studied and isolated (e.g., evaluator effect, experience level of users, ...)
5. Define agile development tools.
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We would then ...

1. be able to choose the most appropriate method
2. enjoy consensus on pros and cons of evaluation practices
3. be able to optimally spend our resources
4. include accessibility within regression testing
5. see that accessibility fixes have measurable effects
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Other areas that would benefit

1. Mobile web applications
2. Search engine optimization
3. Audio/Video textual tagging
THANK YOU!

Questions?

These slides:
www.dimi.uniud.it/giorgio/events/addw

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