

Adaptive Web Accessibility Metrics

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Human Factors, Measurement, Verification.

Keywords

Web Accessibility, Accessibility Evaluation, Accessibility Metrics, Adaptive Web

1. MOTIVATION

Web Accessibility metrics aim at measuring in a precise (often numeric) way the conformance of a given web page with respect to a set of accessibility guidelines. Metrics rely on traditional accessibility guidelines such as WCAG or Section 508, targeting all type of users. Normally, for a more precise assessment that considers specific user groups (blind, deaf, elderly, physically impaired, etc.) only those guidelines that target a determined user group are chosen. This is a first step towards specialization of accessibility metrics; but such a direction can be pursued even more. The following scenarios call for the application of adaptive accessibility metrics:

- Accessibility observatories that need to keep track of accessibility for determined user groups.
- Adaptations are performed by user agents at the user's computer [6] or by server side applications [1]. Metrics can help to determine the impact of adaptations on specific user groups and thus measure the accessibility improvement caused by interface adaptation (if so).
- Quality Assurance when developing websites for particular audiences.
- Knowing beforehand the accessibility level of a web page with respect to a user group allows to apply web content adaptation techniques such as Adaptive Navigation Support [2] or re-ranking search engine results [4].

Metrics based on traditional guidelines are *ad-hoc* solutions that cannot be applied when guidelines change or for a fine-grained approach [3, 7]. In order to address these situations, accessibility metrics should show an adaptive be-

haviour (preferably automatically) and produce user-tailored accessibility scores.

2. ENGINEERING SOLUTIONS

Accessibility metrics are strongly coupled to the evaluation process [8]. Therefore an adaptive evaluation process should take into consideration the following challenges:

- **Automatically capturing and encapsulating user's context data in a profile.** Considering users as member of groups with respect to their disability may not be a very accurate approach. User needs can be so specific that the effect of a given barrier is more closely related to their individual abilities and cannot be inferred from user disability group membership. Thus, users' interaction context should be considered, encompassing the Assistive Technology they are using, the specific browser, the plug-ins, etc. For instance, versioning issues of Assistive Technologies play a key role on evaluations: recent versions can overcome accessibility barriers making the evaluation of some guidelines obsolete while older versions are not able to convey content that conforms with accessibility guidelines.
- **Quantifying guidelines relevance.** In order to tailor evaluation and measurement to the particular needs of users, accessibility barriers or checkpoint violations should be weighted according to the impact they have on determined user groups. Some scenarios require real time scores and there is no place for applying techniques that require human intervention. In order to overcome this problem metrics could access to *Accessibility Commons*-like accessibility metadata authoring frameworks [5] and match a given barrier with triples like \langle accessibility problem, context, severity \rangle that have been stored in advance.
- **Reasoning over guidelines.** Specifying guidelines in such a way that guideline features can be univocally referred and reasoning over them can be done (*e.g.*, by using ontologies). This way, variables that metrics normally require (priorities, number of applied guidelines) can be easily extracted and automatically inferred. What is more, evaluation tools should be flexible enough to interoperate with these guidelines and the above-mentioned user profiles.

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