Usable and accessible e-Voting

Evaluation of the upcoming Norwegian e-Vote solution

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About Norsk Regnesentral/Norwegian Computing Center

Independent non-profit research institution

Applied research on international and national level

Research areas

  Statistics: Primarily oil industry and banking sector
  ICT: Security, Multimedia, e-Inclusion

Motto

"Forskningsresultat som brukes og synes"
"Research results that make a difference"
Outline

Usability and accessibility evaluations

Scenarios

Findings

Conclusions

Questions
Introduction

e-Voting trials in municipality election

e-Vote 2011 project

Prototypes

Development iterations

Usability and accessibility aspects
Usability and accessibility evaluations

Evaluation parts

- Technical testing
  - Markup (HTML)
  - Style (CSS)
  - Accessibility (WCAG)
  - Usability (ELMER)
  - Interoperability (JavaScript)
  - Other

- User testing
  - Ability/disability
  - Nationality
  - Age
  - Gender
  - ICT experience
  - Voting experience
  - Assistive technology

- Expert testing (personas)
Usability and accessibility

Users

Norwegian Association of the Blind and Partially Sighted
Dyslexia Association
Cerebral Palsy Association
Norwegian Federation of Organisations of Disabled People
Senior Centers
Usability and accessibility, cont'd

(Small) financial incentive
In users' home environment
Scientific observer
Video recording
Tasks
Usability and accessibility metrics

Task completion within specified time period

Critical errors
  E.g., particular guidance

Uncritical errors
  E.g., suboptimal work flow (but not exploratory behavior)

Discussion of impression

Ranking of prototypes
Findings

Technical

Upside

No problems with HTML, CSS, and JavaScript
Findings — technical, cont'd

Downside

Static page layout
Lack of fallbacks for technology like HTTP Cookies
At most 85% of WCAG 2 (AA) conformance
Extensive use of tables as means for layout
Text in (raster) images
Low color contrast both with text and images
Insufficient handling of keyboard navigation
50%–70% ELMER conformance
Missing or misleading page headings
Too long help texts
Missing/poor dialogs with user
Findings — personas and users

Upside

- Extensive use of icons appealing in particular to dyslectics
- Clean and simple layout preferred
- The smallest number of navigation options considered as most intuitive
Findings — personas and users, cont'd

Downside

- Lack of multimodal help, e.g. in form of instruction videos
- Confusion by too many options
- "Option suggest" viewed as too demanding compared to other solutions
- No accessible implementation of AJAX/XHR
- Horizontal scrolling
- Help texts too general
- Too small resolutions and poor contrast of user interface elements
- Difficult navigation in sequences of content
- Poor screen reader usability
- Use of unfamiliar terms
- Too small default font sizes and contrasts
- Poor visual feedback and marking of what options (parties/candidates)
- Ambiguous labeling of buttons
- Illogical header and section levels
- Inconsistent ways of selecting items
Findings — general comments

Upside

Positive attitude of vast majority
Favored by disabled persons as they do not depend on other assistance
Problems concerning influence by others outweighed by advantages
Potential to strengthen democracy due to degree of accessibility

Downside

Concerns related to privacy, anonymity, and trust
Conclusions

Significant gap towards accessibility and usability standards
Usability and accessibility not part of development process from the start
Improved training and education of developers and managers
ELMER appears either to have deficiencies or is not applicable
Positive attitude towards e-voting must not be spoiled by poor user experience
Questions

Thank you for your attention!

Questions and comments?

Other information

Project site http://nr.no/pages/dart/project_flyer_e-valg
Till Halbach: http://nr.no/~halbach