Performance-Based Approach to Usability Requirements

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General Goals

- High quality performance standards for voting
  - Objective, measurable criteria
  - Metrics directly address “bottom line” performance of equipment
  - Fair to all technologies
  - Criteria push technology improvement, but realistic
- High quality performance tests for voting
  - Repeatable, reliable, valid
  - Uncover even low-incidence errors
  - Minimize technical complexity, burden on operator

Approach

- Develop performance requirements and conformance tests for usability of voting systems
- Focus on capturing the indication of a voter's choice
- Based on summative usability testing
  - ANSI NCITS 354-2001 Common Industry Format for Usability Test Reports
  - "Defining a summative usability test for voting systems," UPA 2004 Workshop on Voting and Usability

A Summative Usability Test for a Voting System

- Purpose of the test
- Voting system to be used for the test
- The context of use
- Complexity of test ballots
- Characteristics and numbers of test participants
- Tasks for test participants
- Data collected or measured during the test
- How the test data was analyzed and how a system passes or fails the test

Performance Measures

- Efficiency – time and other resources taken to vote
- Effectiveness – low voter-equipment interaction error rate
- Satisfaction – of voter experience, standard surveys for measuring satisfaction

Roadmap

1. Obtain examples of currently used voting equipment
2. Obtain wide range of samples of recent ballots
3. Formulate preliminary metrics

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4. Formulate 3 test ballots, low, med., high complexity
5. Formulate test script
6. Formulate instructions
7. Determine how to record voter sessions
8. Design satisfaction questionnaire, PRA approval
9. Obtain human subjects study approval
10. Run initial experiments until confident in basic protocol

Roadmap (continued)

11. Formulate preliminary performance benchmarks
12. Design statistical approach: error level, # of subjects, confidence levels
13. Formulate approach for demographic selection of subject voters
14. Recruit sufficient # of subject voters to validate
15. Run full-scale usability tests
16. Propose “final” protocols, test ballots, and benchmarks

Benchmarks are based on the actual measurements of performance achieved by the voting systems.

Questions and Discussion

VVSG Version 2 will contain some performance benchmarks.