A Tool for Supporting Web-Based Empirical Research: Providing a New Basis for Web Design Guidelines

Jen Barrick, Brandon Maust, Jan Spyridakis, Matt Eliot, Carolyn Wei, Mary Evans, Kate Mobrand

Department of Technical Communication
University of Washington
Overview

- Current basis for Web design guidelines
- Next step: remote studies
- Difficulties
- Our solution: a holistic research tool
- Implications for research
Basis for Web Design Guidelines

- Expert evaluations
- Usability lab testing
  - Eyetracking
- Surveys
Next Steps

- Rigorous, externally valid, empirical research of online behavior
  - Remote, Web-based studies
  - Large samples
  - Real users in real time/space
  - Comprehensive measurements (behavior, performance, perceptions)
Conducting Remote Studies

Our Internet-based research process:
- Identify adaptable site
- Develop experimental conditions and measurement materials
- Instrument test site
- Run pilot study
- Run series of final trials
- Analyze data
Our Study: Hyperlink Wording

Effect of generic, informative, and intriguing link labels on users’ browsing behavior and comprehension

<table>
<thead>
<tr>
<th>Link Wording</th>
<th>Generic</th>
<th>Informative</th>
<th>Intriguing</th>
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<tbody>
<tr>
<td>Volcanoes</td>
<td>Samoa’s Volcanic Origins</td>
<td>Samoa’s Fiery Past</td>
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<td>Biodiversity</td>
<td>Native Animal Diversity</td>
<td>Tropical Menagerie</td>
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<td>Filariasis</td>
<td>Blood-Borne Disease</td>
<td>Insidious Blood Worms</td>
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Manu'an birds

The Manu'a Islands are famous for local culture and spectacular beauty, and they are an important part of local history, but the wildlife is also special. There are four kinds of birds living in Manu'a that do not occur on Tutuila.

The most beautiful of these is Samoa's only parrot, the sega vau, or blue-crowned lory. This is a tiny jewel of a bird, only 7 inches long, but colored with emerald green back and wings, ruby red face and throat, and a sapphire blue crown. Segavao often come into villages to feed on the nectar of coconut (niu) and coral tree (gaetae) flowers, but they are not easy to see in spite of their bright colors. Your first clue to their presence is often their high-pitched whistles.

Another special bird of Manu'a is the sega o le vau, the lesser (Fiji) shrikebill. This is a charcoal-grey bird with tiny white corners on its tail. This bird is found nowhere else in the Samoan islands. Segao le vau are usually heard before they are seen, for they often make a loud chattering as they poke through dead vines or jela leaves. These birds often ignore people, and if you sit very still they will sometimes feed within arm's reach.

The spotless crake is a small black bird that is extremely rare and has...
Remote Studies: Problems

- Common difficulties:
  - Generating and modifying test sites and surveys
  - Tracking dependent measures of interest
  - Interpreting data from log files
  - Aligning data across servers and formats
  - Exporting data to standard software

- Existing solutions: partial or high effort
Our Solution: Holistic Tool

- Set of PHP and Perl scripts that...
- Supports design, management, and conduct of remote experiments
- Streamlines:
  - Development of experimental materials
  - Data collection
  - Data analysis
Implications: Design

- All experimental conditions generated from single code source
  - e.g., without tool, recent study would have required >500 hand-coded changes to implement 5 conditions across a 19-page Web site
- Site-wide changes easily implemented
- Adding or removing conditions trivial
- Survey design/revision was simple
Implications: Measurements

- Allowed ID of specific links clicked
- Bypassed tedious log file analysis
  - Tracked by assigned ID, not IP address
- Stored path and survey data as single unit per participant
Implications: Data Analysis

- Data extraction facilitated by simple data file structure
- Data easily processed with familiar applications: SPSS, Excel, Access, etc.
- Relationships easily identified among behavior, performance, perceptions
Implications: Logistics

- Remote participation
- No special software required
- Single URL distributed
- Conditions automatically, randomly, and transparently assigned
- Data collected transparently
- Aberrant behavior easily identified
Implications: Research

- Tool facilitated a remotely-conducted, naturalistic study
  - Comprehensive measurements
  - Statistically significant results
  - Externally valid findings
  - Proof of concept for conducting online studies remotely

*Moving beyond the usability lab offers a new basis for Web design guidelines*
For Further Information

- Jen Barrick: laeren@u.washington.edu
- Brandon Maust: bmaust@u.washington.edu
- Jan Spyridakis: jansp@u.washington.edu
- Matt Eliot: mjeliot@u.washington.edu
- Carolyn Wei: cwei@u.washington.edu
- Mary Evans: evansmb@u.washington.edu

Publications:
uwtc.washington.edu/people/faculty/spyridakis/spyridakispub.htm