Privacy Perception of Elders

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Net Trust: Cyber Hygiene for All Generations

✓ Change elders’ perception of security risk
  ✓ Make them aware of the risk
  ✓ Without increasing anxiety

✓ Empowering them to manage what they can manage
  ✓ Manage what they cannot

✓ Side benefit increases elder use of all net services
Net Trust: The Technical Result

- Interaction customized for elders
  - Usable for any business
  - Interaction customized for different populations
- Most vulnerable to fraud off-line
  - Have the most wealth
- Side benefit could be used by any business with employees access company sites from home
Working with BITS

✓ Create awareness of the need for design for elders and design for security
✓ SBIR opportunities
  ✓ Technology transfer
  ✓ DHS cooperative support
✓ Partnership with Indiana University Center
  ✓ Individual companies partner ETHOS
    ✓ For previews of work
    ✓ Annual presentations and product previews
Overview

✓ Technology results
  ✓ Three prototypes, three variables

✓ Representative survey
  ✓ Results

✓ Design principles
Three Prototypes. Three Variables

✓ Three Prototypes
  ✓ Trust cube
  ✓ Presence clock
  ✓ Beacon strip
Three Prototypes. Three Variables

✓ Three Variables
  ✓ Utility = perceived usefulness & perceived risk
  ✓ Activity sensitivity
  ✓ Data recipient
  ✓ Data granularity
Demographics

✓ 34 males and 67 females
✓ 23 people lived alone and 78 other
✓ Demographics
✓ Three prototypes
✓ Willingness to pay
Outcome

✓ High degree of correlation
  ✓ Perceived usefulness
  ✓ Perceived risk
  ✓ Activity sensitivity (measured as intimacy)
  ✓ Data recipient
  ✓ Data granularity
Survey

✓ 101 participants, five useful sections
  ✓ Demographics
  ✓ Three prototypes
  ✓ Willingness to pay
Willingness to Pay

✓ Major correlations
  ✓ Utility (benefit v risk)
  ✓ Overall anxiety
  ✓ Income
  ✓ Technology use
Willingness to Pay

✓ Risk is a component of willingness to pay
  ✓ Data sharing correlated
  ✓ Privacy inversely correlated
  ✓ Privacy is inversely correlated with income
    ✓ Distinct from previous populations
What to Do?

- Change risk perception
- Change perceived benefit
- Illustrate utility
How?

✓ Translucent Design
✓ Single narrative
✓ Visible information
✓ No overwhelming detail
Beacon Strip

✓ Utility visible
✓ Data invisible
✓ Risks minimal
Presence Clock

- Utility visible
- Data visible
- Risks social
Ambient Cube Case Study

- Ambient Cube Case study
- Technology as risk communication
- Balance
  - Risk communication
  - Avoid anxiety
  - Requires empowering technology
Stand Alone Warnings

Traditional mechanisms to communicate trustworthiness.
Scary?

Advanced to the dual core.
Mental Models in Security Literature
Safety in numbers
Trust and Context

Resource Verification
Resources can be identified as new versus established; by location; and the by surrounding context.
Trust and Context

Resource Verification

Resources are often fairly easy to identify as “good” or “bad” in physical realms.
Trust and Context

Contextual Information is not available on the web.
Useful?
Defendable?

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“The number of websites hosting keylogging crimeware systems rose by over 1,100, reaching 3,362, the second highest number recorded in the preceding 12 months.” Websense Security Lab
Avoiding Malicious Sites

✓ Net Trust
  ✓ This requires variables that cannot be controlled by the phisher
  ✓ Includes “do NOT trust” signals
  ✓ Includes other “quality of site” signals
  ✓ Design goal: Minimize trust required for toolbar
Do Not Assume Trust

- Reputation based on
- Implicit based on behavior
  - First visit results in delayed rating
    - Time delay is roughly equivalent to lifetime of phishing sites 72hrs
  - 1-nth visit increased by one
  - Increases up to nth visit, decreases to as low as n/2 after a delay
  - Trust fades over time
Do Not Assume, but Enable

- Explicit based on direct entry
  - Rating and comments do not change
  - Set by user
  - Combine peer and centralized ratings sources
  - Minimize explicit user-rating actions
User- Centered Signaling

- del.icio.us
  - Embedded in browsing
  - Requires making all information public
- Google
  - Requires discrete search
- Blogs, Epinions, Amazon Reviews
  - Can be anonymous, rarely is
Net Trust View

Using a user’s **social network** (known as a buddy list) as well as user-selected **centralized authorities** (known as broadcasters) the Net Trust system displays meaningful information to the user so they can make an educated decision about the trustworthiness of a website.
Alternative Interface

☑ Elderly testing
  ☑ Too much cognitive load
  ☑ Unaware of risks
  ☑ In denial about privacy issues
  ☑ No understanding of social networks
SWAT: Surfing With Ambient Trust

- Touch pressure alters the rating
Ambient Trust Orb

✓ All ratings are added together with third party dominance or integration
All ratings are added together with third party dominance or integration
User-Centered Security

✓ This is not a bank. If you enter your bank information your money can be stolen.
User-Centered Security

This is not a bank. If you enter your bank information your money can be stolen.

✓ This is a bank. Please wait one moment while your security settings are changed appropriately.
Design Principles

- Align with their mental models
- Enable them to utilize their social network
- Build for human trust decisions, not technical analyses
Closing

✓ Translucent design
✓ Risk communication, consider cognitive load
✓ Make utility clear
✓ Connect to activity
✓ Automate, inform, empower