User Experience Design for E-Voting
How mental models align with security mechanisms

Marie-Laure Zollinger

E-Vote-ID 2019
2019 October 2

Joint work with Verena Distler, Peter B. Rønne, Peter Y.A. Ryan, Carine Lallemand, Vincent Koenig
Outline

1. Motivation
2. Design
3. Results
4. Future Work
Motivation

“We take a different approach and revisit an old idea: to provide each voter with a private tracking number. […] This is appealing in that it provides voters with a very simple, intuitive way to verify their vote, in the clear.”

—in Selene: Voting with Transparent Verifiability and Coercion-Mitigation
(Peter Y.A. Ryan, Peter B. Rønne, Vincenzo Iovino)
Design of a user interface

System

Image

Perception
Selene

Vote → Enc(vote) → Tally

Verify

Enc(vote)
A User Centred Approach

Ideation → Generation → Evaluation
Testing with paper
Mobile Application

Please enter your credentials (ID and Password) received by mail.

Password:

Welcome to the 2018 Elections.

We have developed an easy-to-use voting app for your convenience. Click on “Next” to proceed.

Vote for your candidate:
- Candidate A
- Candidate B
- Candidate C
- Blank

You selected:

Candidate B

November 8, 2018

Your vote has been successfully submitted.

When the election is over, you will receive a letter telling you how to check the result.

The votes have been counted.

The results are:

- Candidate B: 41%
- Candidate C: 28%
- Candidate A: 22%
- Blank: 7%

You can now view a list with all submitted votes.

Why should I check if my vote is on the list?
- It lets you control the correctness of our records.
- By doing so, you contribute to validate the result of the election.
- This process allows independent organizations to check the validity.

Below, you can see the list of counted votes. Click on “See my vote” to see your vote in the list.

Retrieving encrypted tracking number.

Decrypting tracking number.

Below, you can see your vote in the list of votes. Thanks for checking!
“Mental models are people’s view of the world, of themselves, of their own capabilities, and of the tasks that they are asked to perform, or topics they are asked to learn.”

—Donald Norman
User Study

Mental Models

Secrecy
Privacy
Coercion

Trust

Verifiability
Hacking
Approachability
Observer

Marie-Laure Zollinger
E-Vote-ID 2019
User Experience Design for E-Voting
What have we learned?

Impact on Voting Research

- People care about *Privacy* and *Coercion*
- *Verification* is confusing
- *Trust* important for security perception
- Accessibility of knowledge

Impact of Design

- 100% of effectiveness
- A lack of understanding
- Security unseen

Limitations

- 1 hour to understand
- Incomplete experience
Future Work

Thanks for your attention!

Marie-Laure Zollinger
marie-laure.zollinger@uni.lu