Observation Study on Usability Challenges for Fingerprint Authentication Using WebAuthn-enabled Android Smartphones

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Introduction

Passwords and Security / Usability Problems

Security:
- Reuse password...

Usability:
- Hard to remember
- Need another device ...

Expectations for New Authentication Protocol: WebAuthn

- Various authentication methods can be provided for websites by using Web Authentication (WebAuthn; W3C standard).
- Biometrics, e.g. fingerprints, can be alternatives to passwords
- Our website (Yahoo! JAPAN[1]) has adopted WebAuthn.
- Users can login using fingerprint authentication with their WebAuthn-enabled Android smartphones in the same manner as screen lock with fingerprint.

Contributions

1. First user study of WebAuthn usability on fingerprint authentication.
2. Design implications for improving usability.  [1]: https://www.yahoo.co.jp

Methodology

Participants

- Android smartphone users
- They have their own accounts on our site
- They had never done WebAuthn registration or tried but failed the setup
- Employed
- Most of them (9/10) have non-IT-related profession

Our Observation Study

- Asked participants to use actual authenticator registration service (see left)
- Get many comments through conversations with moderators.

Study Results

1. System Usability Scale (SUS) Analysis

- SUS score: 63.5 (average), which is "Marginal high."

2. Objective analysis

G1: Unlocking smartphone. (all participants succeeded)
G2: Completing authenticator registration. (only 3 participants succeeded)
- 7 participants could not hold their fingers over the sensor.
- All tapped the fingerprint-like icon on the dialog box displayed by the WebAuthn function.
- Comments of non-successful participants (all of whom tapped fingerprint icon):

G3: Completing login using registered authenticator. (9 participants succeeded)
- [Goal] Participant can login using the registered authenticator after logging out.

3. Subjective Comment Analysis

Fingerprint Authentication Usability is Good for Participants

- Usability is good for almost participants [Q1, Q3, Q5].

Fingerprint Dialog Usability is Not Good for Participants

- Participants frequently tapped their fingerprints on the icon, unexpectedly [Q1, Q2].
- Participants felt not so good about fingerprint dialog [Q4, Q5].
- Things displayed in the box did not remind participants of the fingerprint authentication.
  - Dialog should be implemented like Apple's side button (see right)

Discussion and Design implications

- Get many comments through conversations with moderators.

https://support.apple.com/en-us/HT208109