Authentication Melee: A Usability Analysis of Seven Web Authentication Systems

Passwords continue to dominate the authentication landscape in spite of numerous proposals to replace them. Even though usability is a key factor in replacing passwords, very few alternatives have been subjected to formal usability studies, and even fewer have been analyzed using a standard metric. We report the results of four within-subjects usability studies for seven web authentication systems. These systems span federated, smartphone, paper tokens, and email-based approaches. Our results indicate that participants prefer single sign-on systems. We report several insightful findings based on participants' qualitative responses: (1) transparency increases usability but also leads to confusion and a lack of trust, (2) participants prefer single sign-on but wish to augment it with site-specific low-entropy passwords, and (3) participants are intrigued by biometrics and phone-based authentication. We utilize the Systems Usability Scale (SUS) as a standard metric for empirical analysis and that it produces reliable, replicable results. SUS proves to be an accurate measure of baseline usability. We recommend that new authentication systems be formally evaluated for usability using SUS, and should meet a minimum acceptable SUS score before receiving serious consideration.

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