



Keep it Simple

UX Design in Cybersecurity



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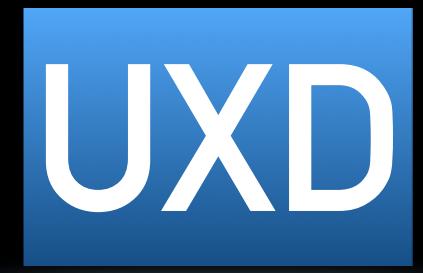


University of
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Learning with Purpose

Outline

- UX Design Overview
- Password UX Design

UX Design Overview



UXD

UX Design

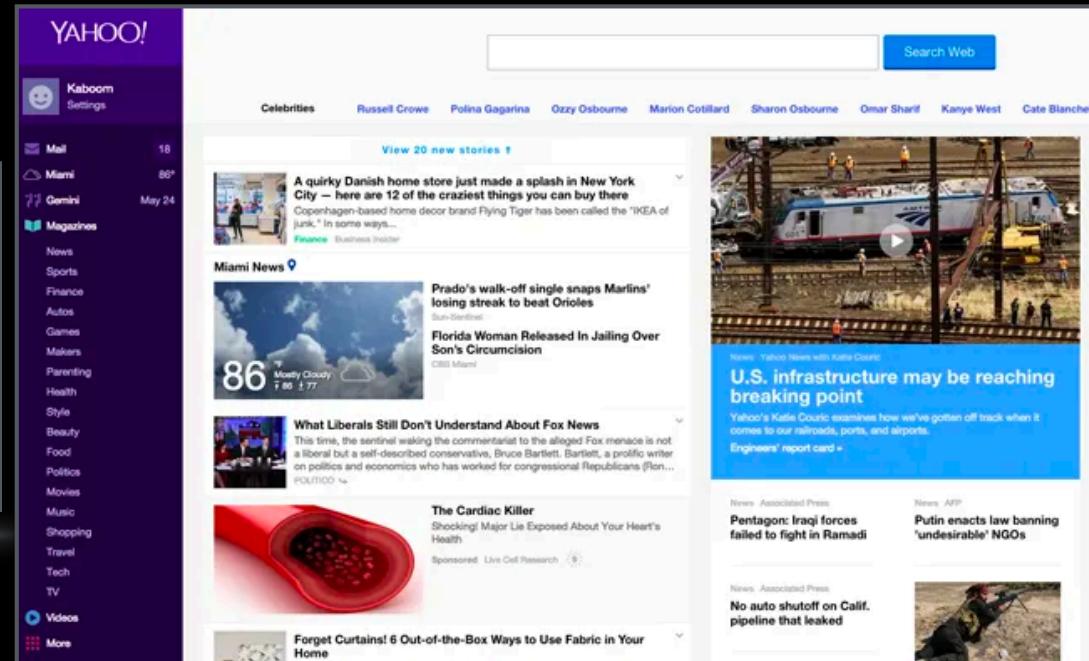
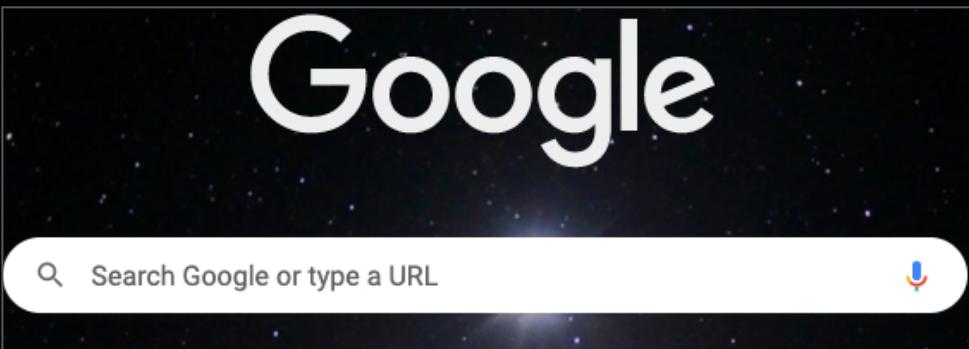
User eXperience (UX) Design is the process of creating products that provide users with a meaningful and relevant experience

UX Design (Cont'd)

Simplicity is a design philosophy that

- helps users achieve their goals faster and more efficiently while enjoying a great user experience

UX Design (Cont'd)



Google directs the user's attention to “search” only

Yahoo diverts the user's attention away from “search”

UX Design (Cont'd)

What is the role of UX design in Cybersecurity?

- One of the goals in a Cybersecurity system: keep users' information safe
- How can UX design help to achieve the goal?

UX Design (Cont'd)

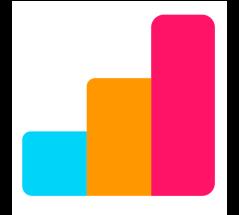
Usable Security (usability + security), e.g.,

- **Passwords and authentication**
- Default Privacy Setting
- Email Encryption

One example — Password UX Design (UXD)



Password UXD



Poll:

- How many different passwords do you have?
- How long are your passwords (how many characters) usually?
- Do you reuse your passwords for multiple accounts?

Password UXD (Cont'd)

Is your password secure?

- What have you learned from “John the Ripper Password Cracker” Activity?



Password UXD (Cont'd)

Passwords are hard to remember, e.g.,

- 50%+ have only five passwords or less
 - many people make small, incremental changes to existing passwords
- 60%+ reuse passwords among multiple websites
- 40%+ change their passwords only once a year or less (30%+ never change their passwords)

Password UXD (Cont'd)

Passwords aren't really secure, e.g.,

- > 50% don't change their password even when a data breach happens
- < 10%, and probably < 2%, have passwords that are complex enough and long enough to withstand a combination of dictionary, rainbow, and brute-force attacks

Password UXD (Cont'd)

- Users prefer:
 - simple, easy to remember, reuse passwords
- Security requirements:
 - lengthy and complicated passwords (e.g., a minimum length of 16 characters)
 - can't reuse passwords

Password UXD (Cont'd)



Simplicity vs. Security?

UXD in CyberSecurity

if simplicity in design is sacrificed, most users choose to sacrifice security, e.g.,

- using short, reused, never changed passwords
- using default setting
 - 95% of the people stick to the default option

UXD in CyberSecurity

UX designers should provide simple and secure UX design, to achieve the system goal (Simplicity + Security), working together with security experts, engineers. e.g.,

- easy and safe authentication
- make the default setting safer



Password UXD

- Make the password requirements visible — Provide simple, clear expectations from the beginning



Email Password Requirements

3. Passwords must include at least three out of four of the following:
 - o Contain at least one upper-case character
 - o Contain at least one lower-case character
 - o Contain at least one special character (i.e., @!#\$%&*)
 - o Contain at least 1 numeric character
4. Valid special characters are: ` ~ ! @ # \$ % ^ & * () _ + - = { } | [] \ : " ; ' < > ? , . /
5. Passwords may include a space
6. Passwords cannot contain all or part of your name

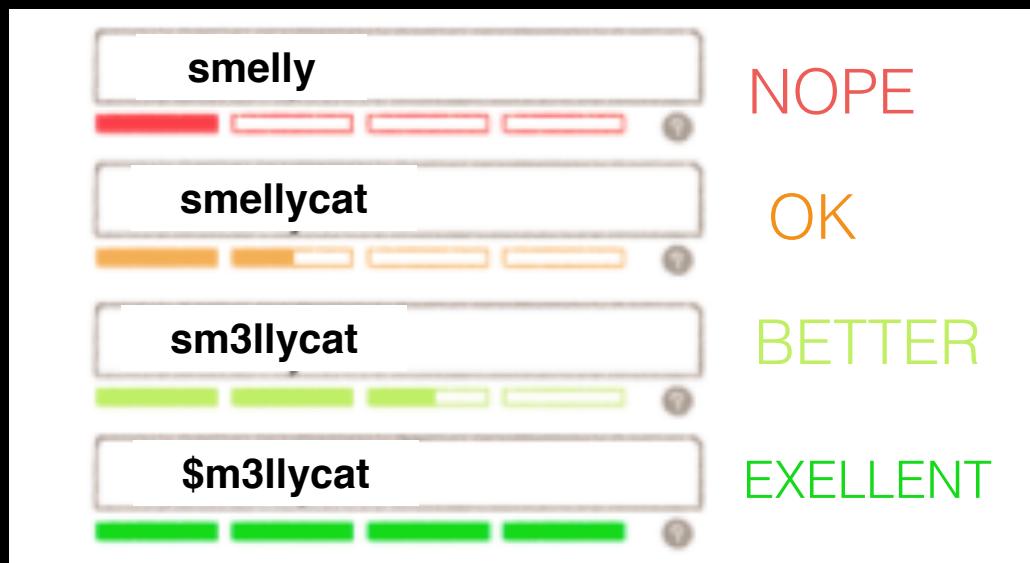
Password UXD (Cont'd)

- Give examples — Educate users how to create safer passwords

Weak Password	Better Password	Excellent Password
kitty	kitt7Smell7	kitt7%Smell7
superman	sup5rm@n	sup5rM@n
susan	Su\$1n53	.Su\$1n53
bluefish	blu5F1sh	blu5_F1sh@

Password UXD (Cont'd)

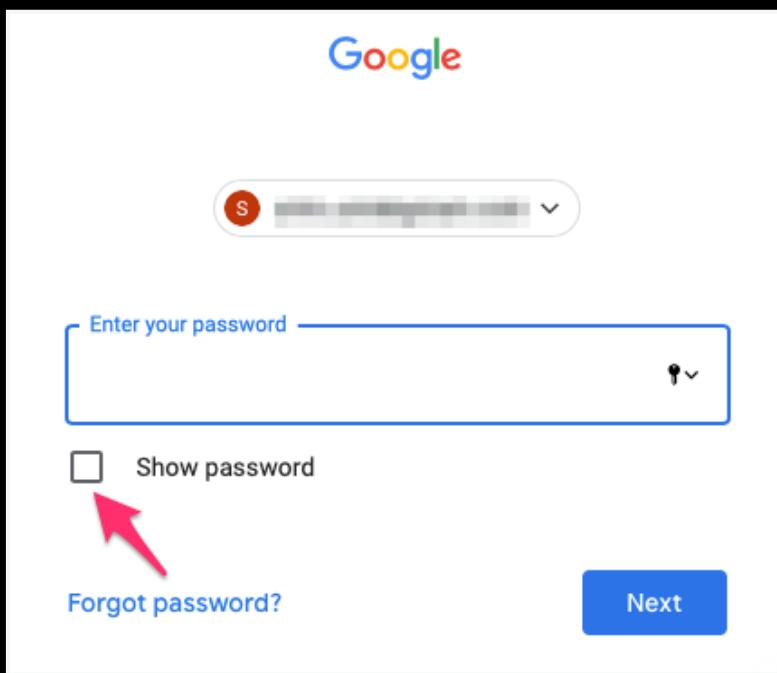
- Show how strong the password is — Motivate people to create stronger password



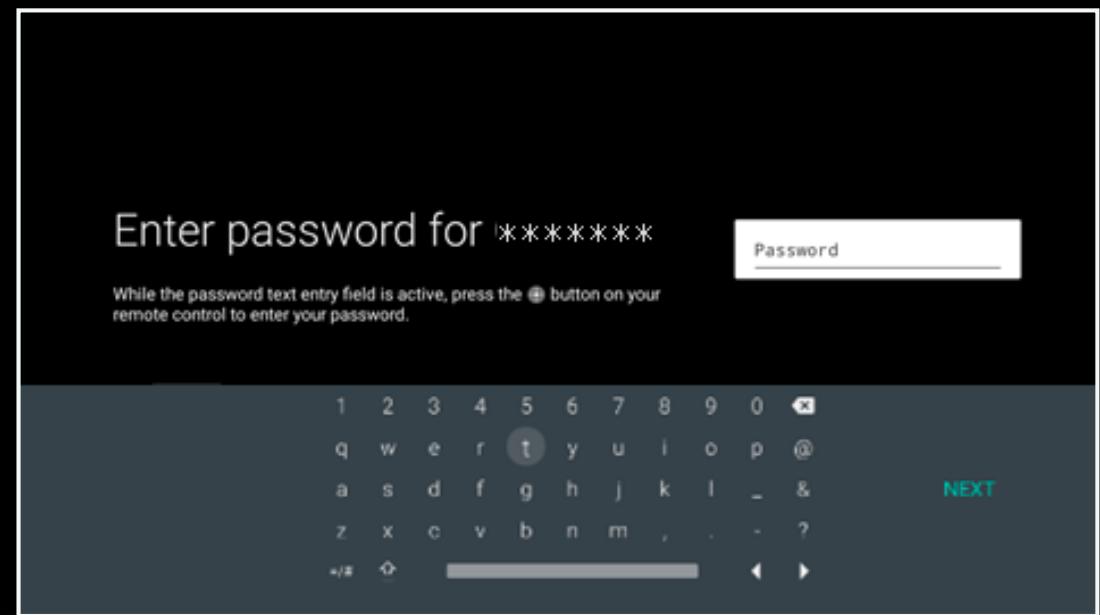
Lifewire.com

Password UXD (Cont'd)

- Allow users to unmask the password — Support user memory and allow users to check their work



Google login



Android TV login with a remote

UXD Activity

Your team is responsible for giving end-users advice on how to create strong passwords

1. Find the slide (with your group number) in the shared Google slides:

<https://tinyurl.com/uxdActivity>

2. Define rules that you will give to the users
3. Pick one password from the wordlist
4. Modify the password to be a strong one
5. Briefly explain why the original word is not secure and why the revised one is better

(Instruction: <https://tinyurl.com/uxdActivityIns>)

UXD Activity (Cont'd)

Presentation time!

Password strength test:

<https://www.my1login.com/resources/password-strength-test/>

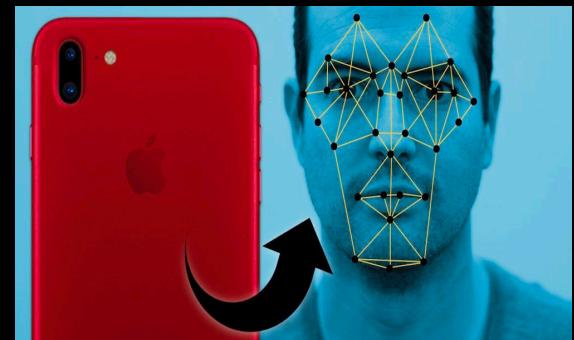
Password UXD alternatives — Biometric authentication

A security process that relies on the unique biological characteristics of individuals to verify users' identities



Biometric authentication (Cont'd)

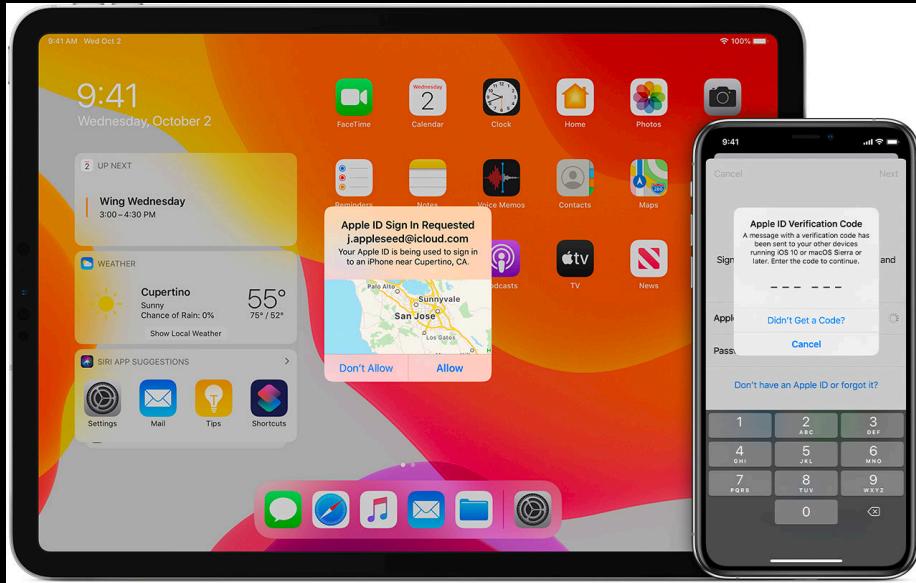
- available on smart phones



Biometric authentication (Cont'd)

Pros	Cons
Highly reliable hard to fake or steal	Unavailable in most desktop
Nothing to forget, minimum efforts — fast and easy on the user	need other techniques ensure a high level of security, could be costly

Password UXD alternatives



Apple Two-Factor Authentication

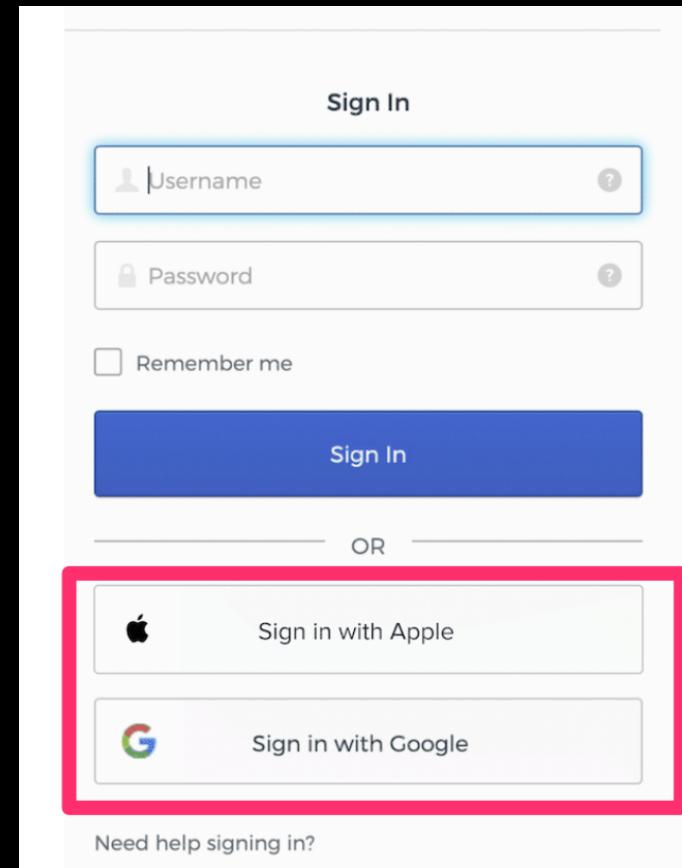
Multi-factor authentication (MFA)

- presents two or more pieces of evidence to an authentication mechanism
- more secure, but could be more complicated

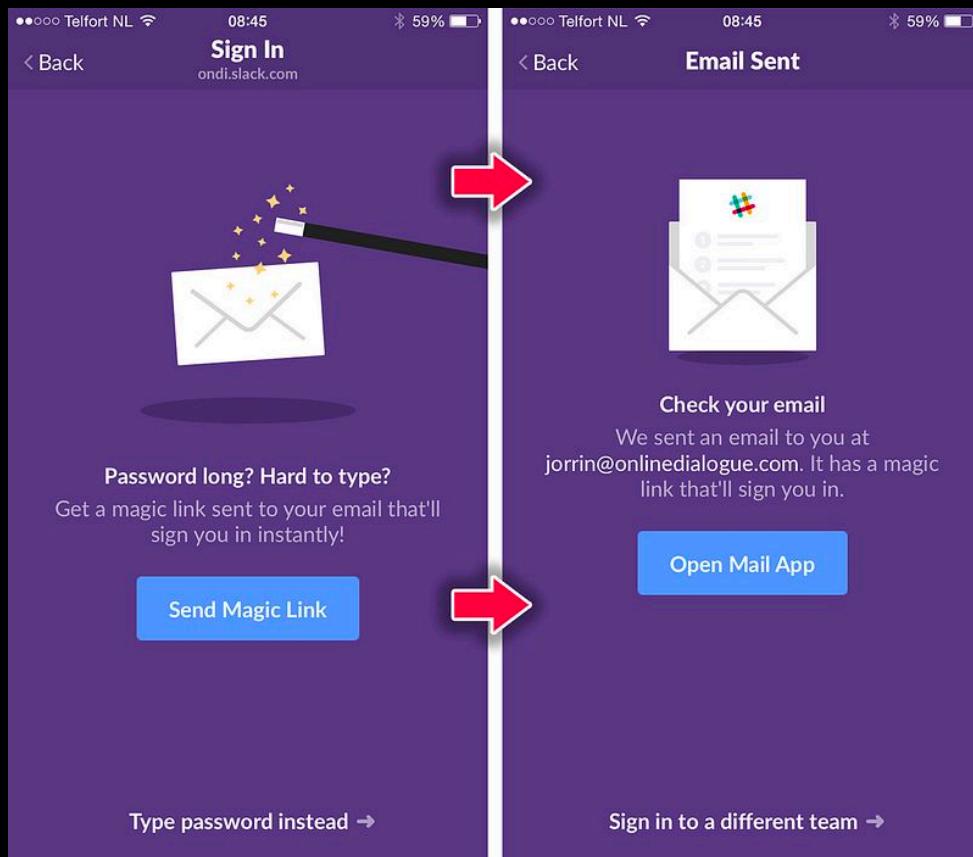
Password UXD alternatives (Cont'd)

Social (and other third-party) authentication

- uses information from social networking sites to facilitate logins on third-party applications and platforms
- designed to simplify sign-in and registration experiences



Password UXD alternatives (Cont'd)



No password authentication

- allows users to log in to a computer system without entering a password
- provides simple user experience with good security

Take-home message

It is crucial to keep “Simplicity” when designing a cybersecurity system. Otherwise, security will be compromised.

Security + Simplicity = more secure system



Homework

- Help check if your parents have secure passwords
- Try a biometric authentication (and compare it with using passwords)

Any Questions?

References and more reading

- Interaction Design Foundation (IxDF) Website, <https://www.interaction-design.org/>
- CONSUMER SURVEY: PASSWORD HABITS, A study of password habits among American consumers, www.csid.com, September 2012, https://www.csid.com/wp-content/uploads/2012/09/CS_PasswordSurvey_FullReport_FINAL.pdf
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