# Usable Security

Dr. Asem Kitana

# Usability

- The mechanism of employing a system to achieve a set of goals, by taking in the consideration effectiveness, efficiency, and satisfaction.

- Usability is deployed to improve user experience and interaction with systems.

# Usability Components

- Effectiveness:

The ability of a system to provide facilities/features to users to reach their goals.

- Efficiency:

The amount of available resources (e.g. time, effort, actions) that can be utilized by users to reach their goals.

- Satisfaction:

The measurement of how pleasant the user is when using a system.

# Usability Components

- Effectiveness:

Can users achieve their goals with the system?

Can users do what the system says it should be able to do?

- Efficiency:

How much effort is required from users in order to achieve their goals?

- Satisfaction:

Is the system pleasant to use?

# Security vs. Usability

- Security is a process, rather than a product.
- In security, humans are the weakest link.
- Therefore, hackers only need one error from this weakest link (humans) in the security process, in order to conduct a successful attack.
- Social engineering attacks work pretty good in this context.

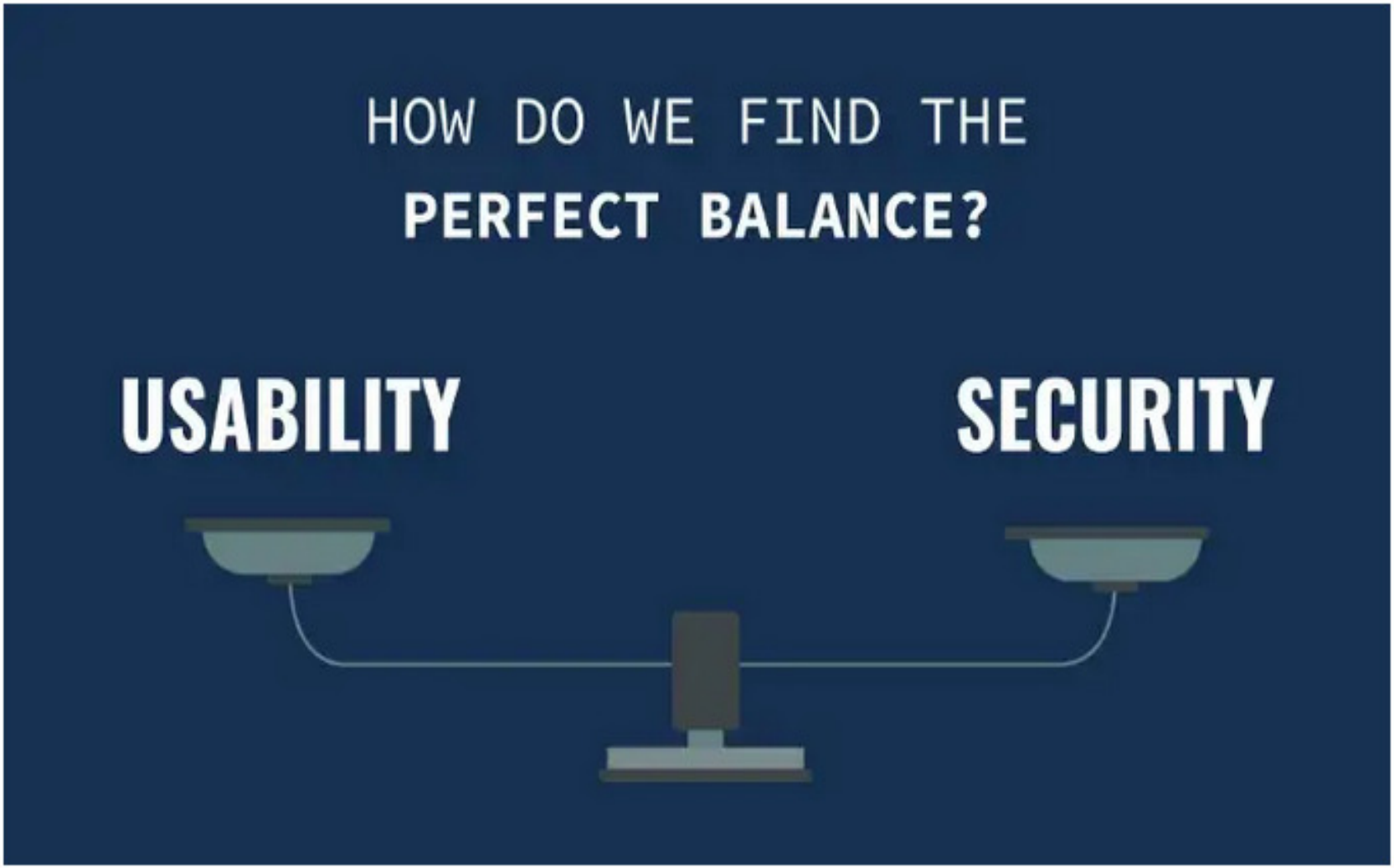
# Security vs. Usability

Confidentiality
Integrity
Availability

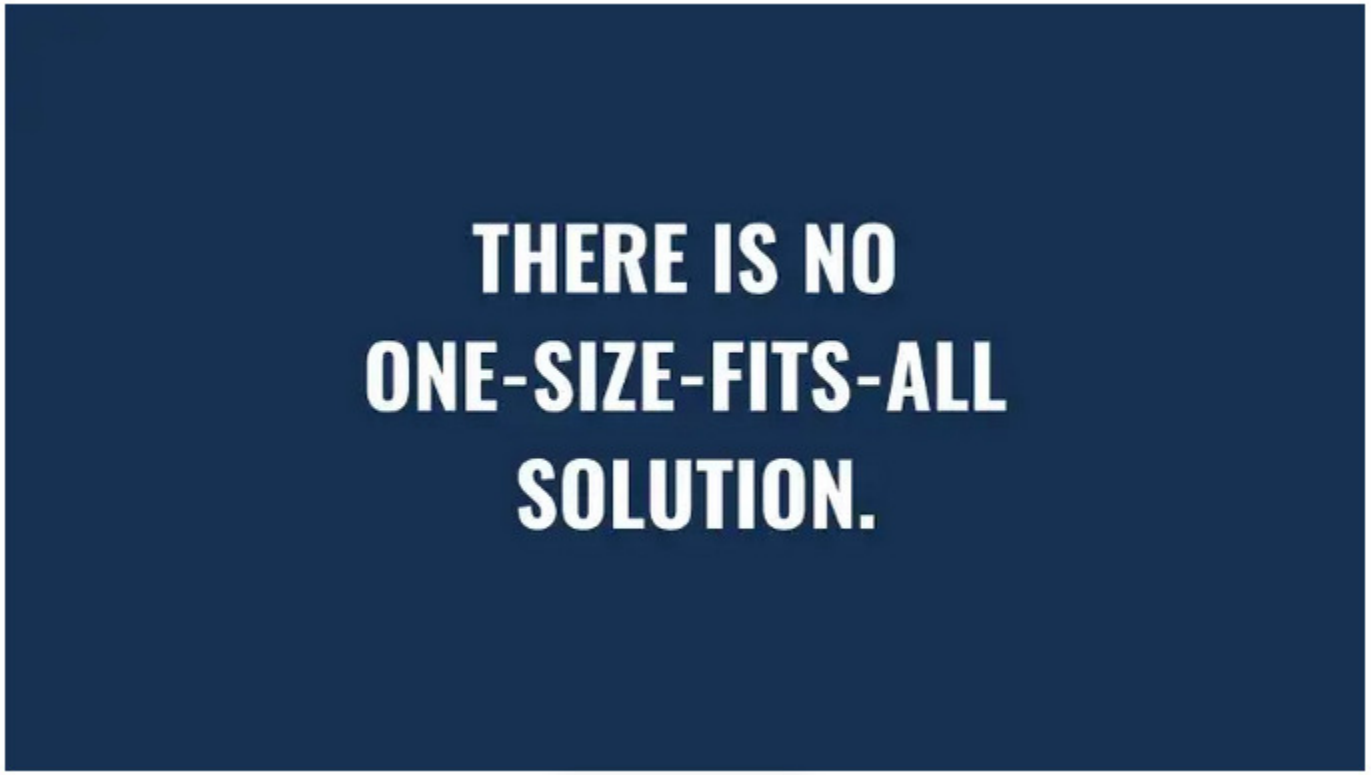
**VS.**

Effectiveness
Efficiency
Satisfaction

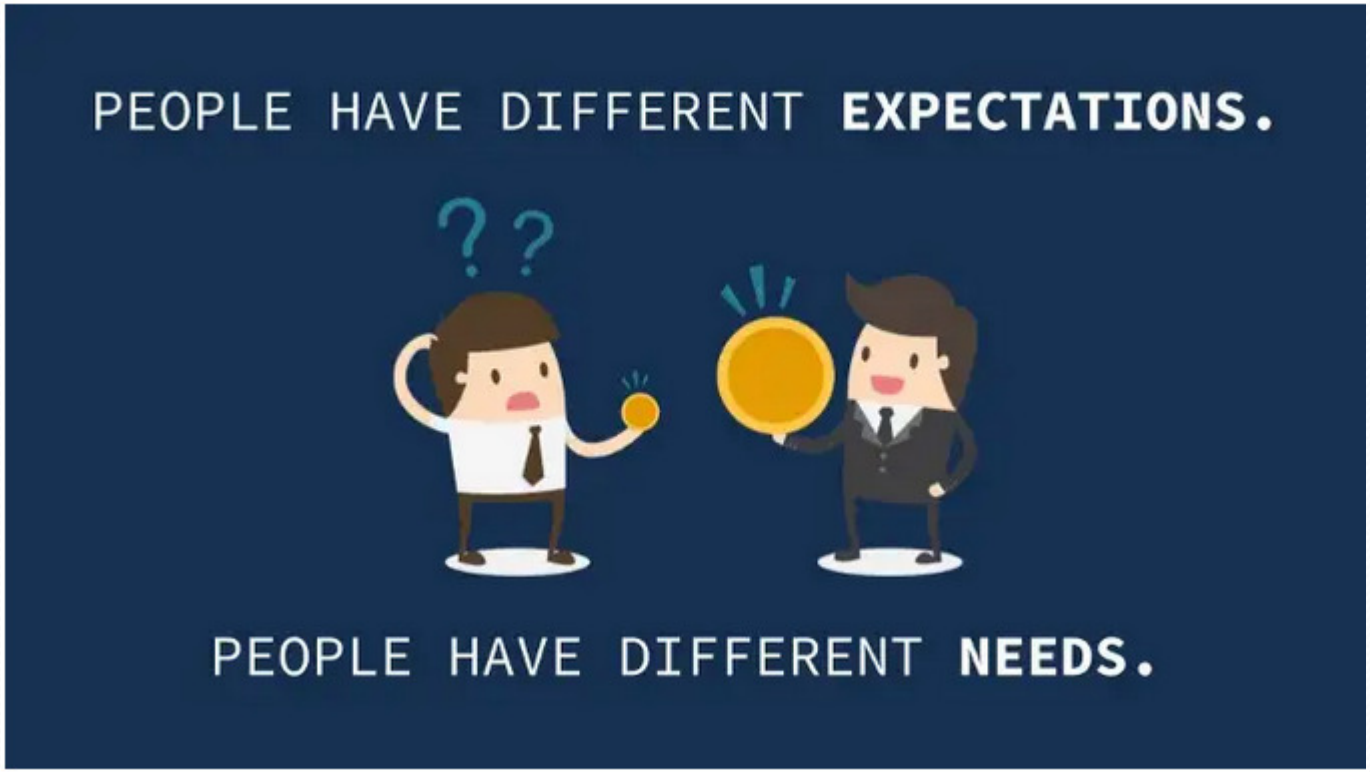
# Security vs. Usability



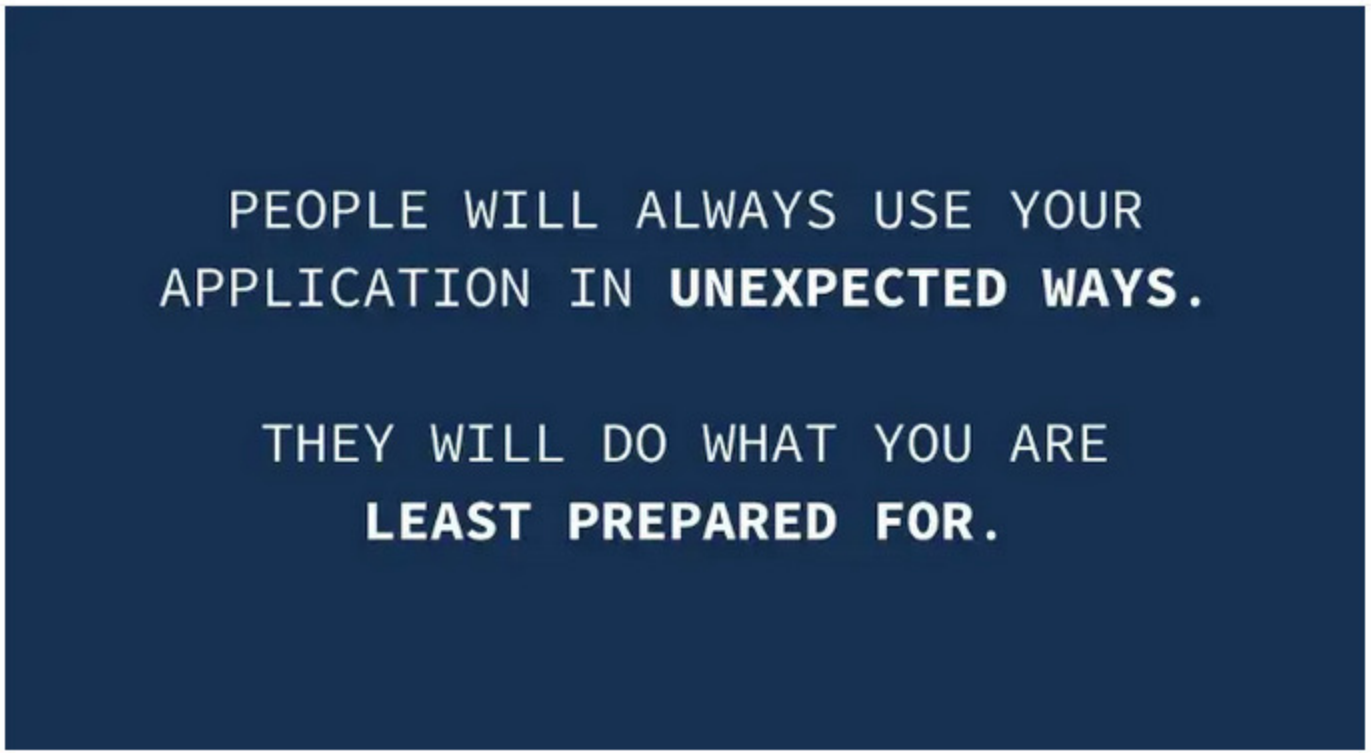
# Security vs. Usability



# Security vs. Usability



# Security vs. Usability

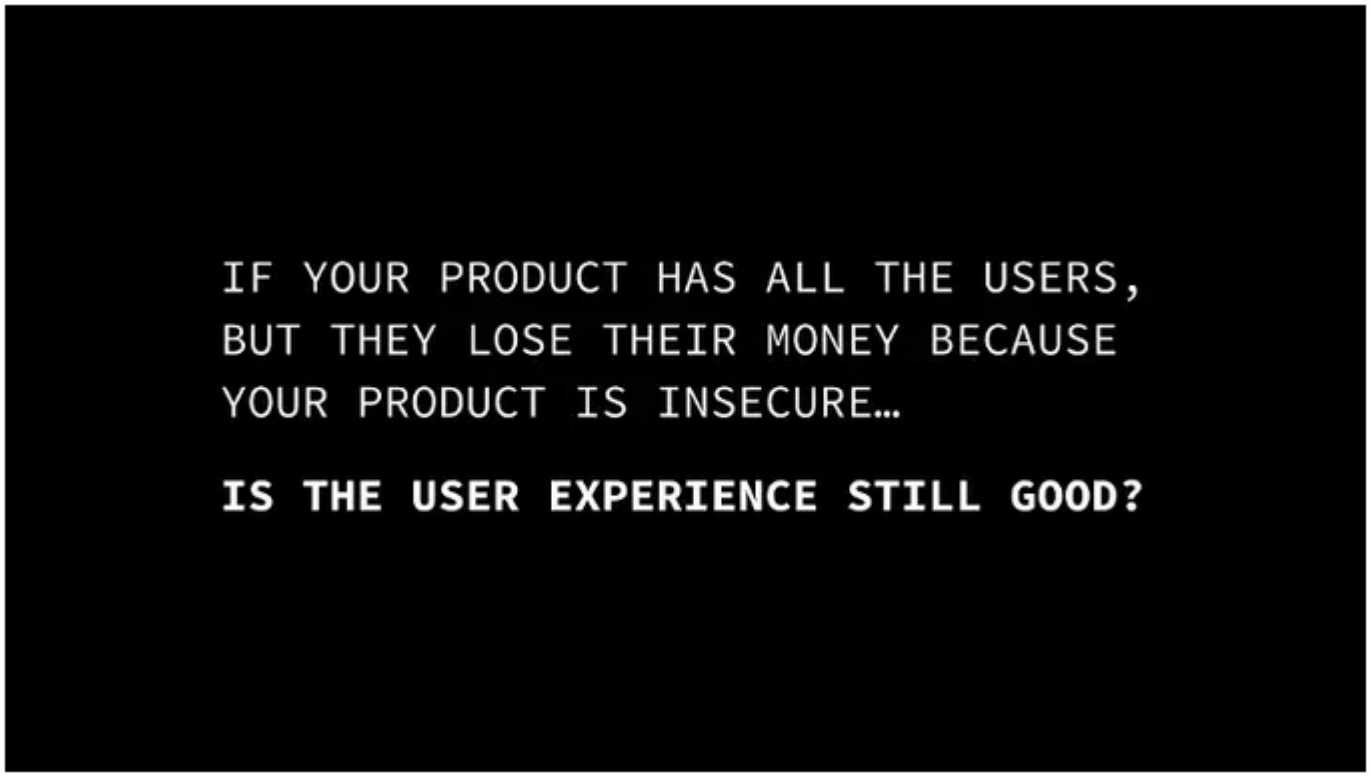


# Security vs. Usability

IF YOUR USER EXPERIENCE IS SO BAD THAT YOUR PRODUCT HAS NO USERS…

**DOES IT MATTER THAT IT'S TERRIBLY INSECURE?**

# Security vs. Usability



# Security-Usability dilemma

- Usually the user looks for the effectiveness, efficiency, and satisfaction of a system, rather than the confidentiality, integrity, and availability of that system.

- In other words, users look for the ease of use, rather than the security of a system.

# Example: Passwords

- If a password is *very* strong (secure), then it is not usable (hard to remember).
- If a password is usable (easy to remember), then it is very weak (insecure).
- If a strong password should be used, but the user can not remember it, then the user will write it down.

# Usable Security

Passwords Security-Usability dilemma solutions:

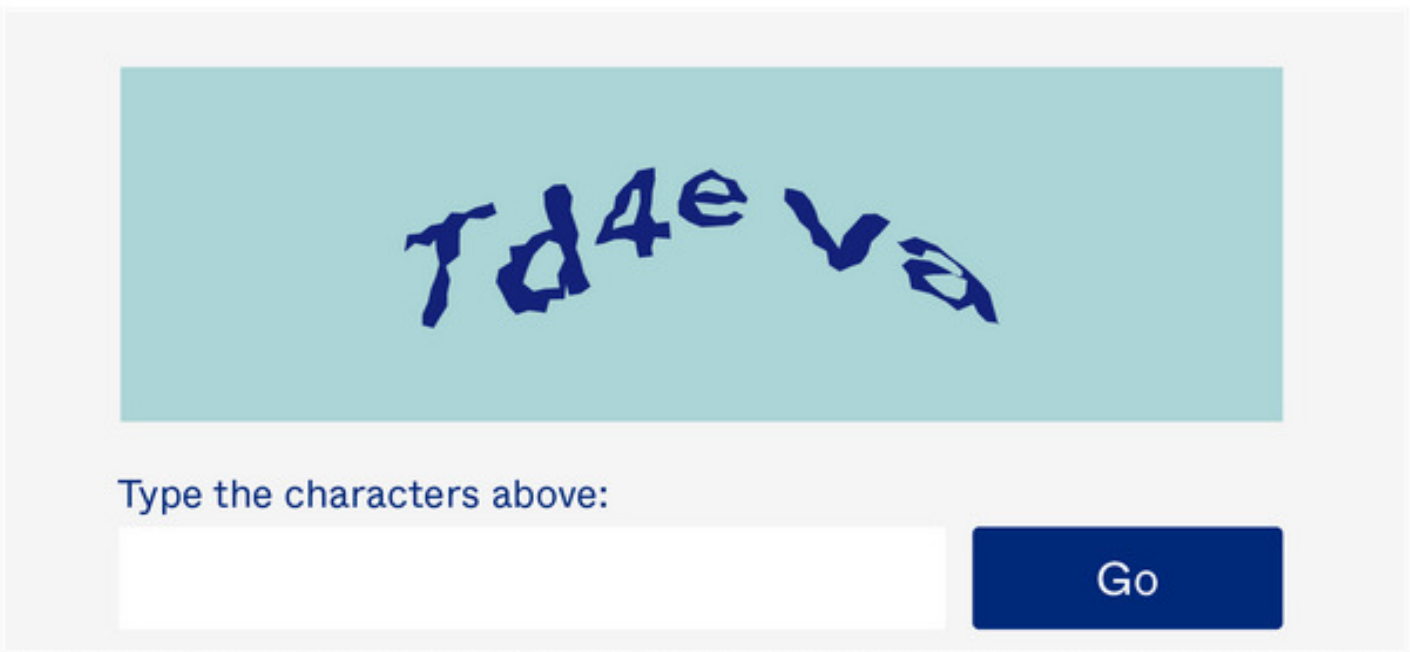
- Passphrases
- Frequently changed passwords
- Dynamic passwords
- Graphical passwords
- Hardware-based solutions (e.g. Tokens)

# Graphical Passwords

- Graphical passwords could be a good solution for the security-usability dilemma:
  - Larger password space
  - More difficult to build dictionary
  - Easier to remember and harder to forget
  - Better balance between security and usability

# Example2: CAPTCHA

- Completely Automated Public Turing test to tell Computers and Humans Apart
- Represents a form of challenge-response test used in systems to determine whether the user is human.



# Usable Security

- CAPTCHA security-usability dilemma:

- If a captcha is very strong, then it is hard for machines, and also hard to be solved by users.
- If a captcha is easy for users to solve, then it is often weak (easy for machine to recognize).

# Usable Security

- Can we find a better CAPTCHA scheme that provides a good balance between security and usability?

  - CAPTCHA + Behavioral Biometrics
  - CAPTCHA + BMI (Brain-Machine Interface)

# Usable Security

Usable Security is the study of how we can best ***balance*** the needs of security with how the users of that system wish to use it.

# Usable Security

- Good Practices:

- Deploy strong cryptography algorithms in data communications.
- Assure the user involvement in the system design process.
- Conduct user modeling for new security features.