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TRANSFORM

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Users Are Not Stupid: Eight Cybersecurity Pitfalls Overturned

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The Human Element of Security

Usability

> the extent to which a system, product or service can be used by specified users to achieve specified goals with effectiveness, efficiency & satisfaction in a specified context of use

ISO 9241-11:2018

Usable Security

> Security must be usable by persons ranging from nontechnical users to experts and system administrators. Furthermore, systems must be usable while maintaining security. In the absence of usable security, there is ultimately no effective security.

A Roadmap for Cybersecurity Research, **U.S. Department of Homeland Security, 2009**

Why the Human Element is Often Overlooked

Cybersecurity is a technology-centric field

Many security professionals have little to no training on the human element

Taking a human-centric approach may be viewed as resource-intensive

Security professionals may have misconceptions about the human element

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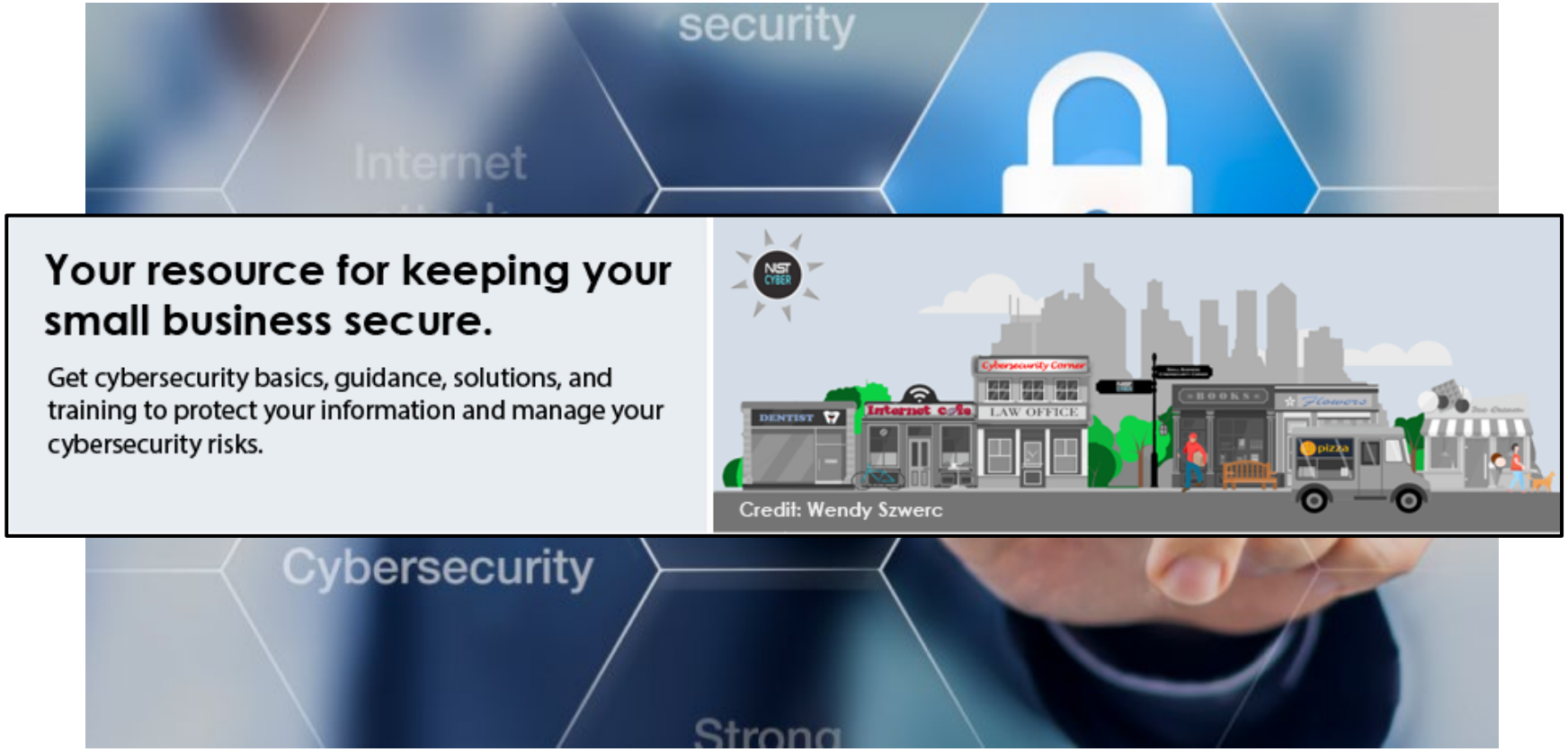
Eight Pitfalls

Pitfall #1: Not identifying all the users in security

- Often only think of “end users” and then lump them all together
- May fail to recognize other people impacted by security solutions and decisions




Pitfall #1: Example



Pitfall #2: Assuming users are stupid or hopeless

- Viewing users as the “weakest link” and the root of all problems
- Us vs. them mentality
- Comes across as arrogant, antagonistic
- Removes user agency

Pitfall #2: Example

Security Fatigue

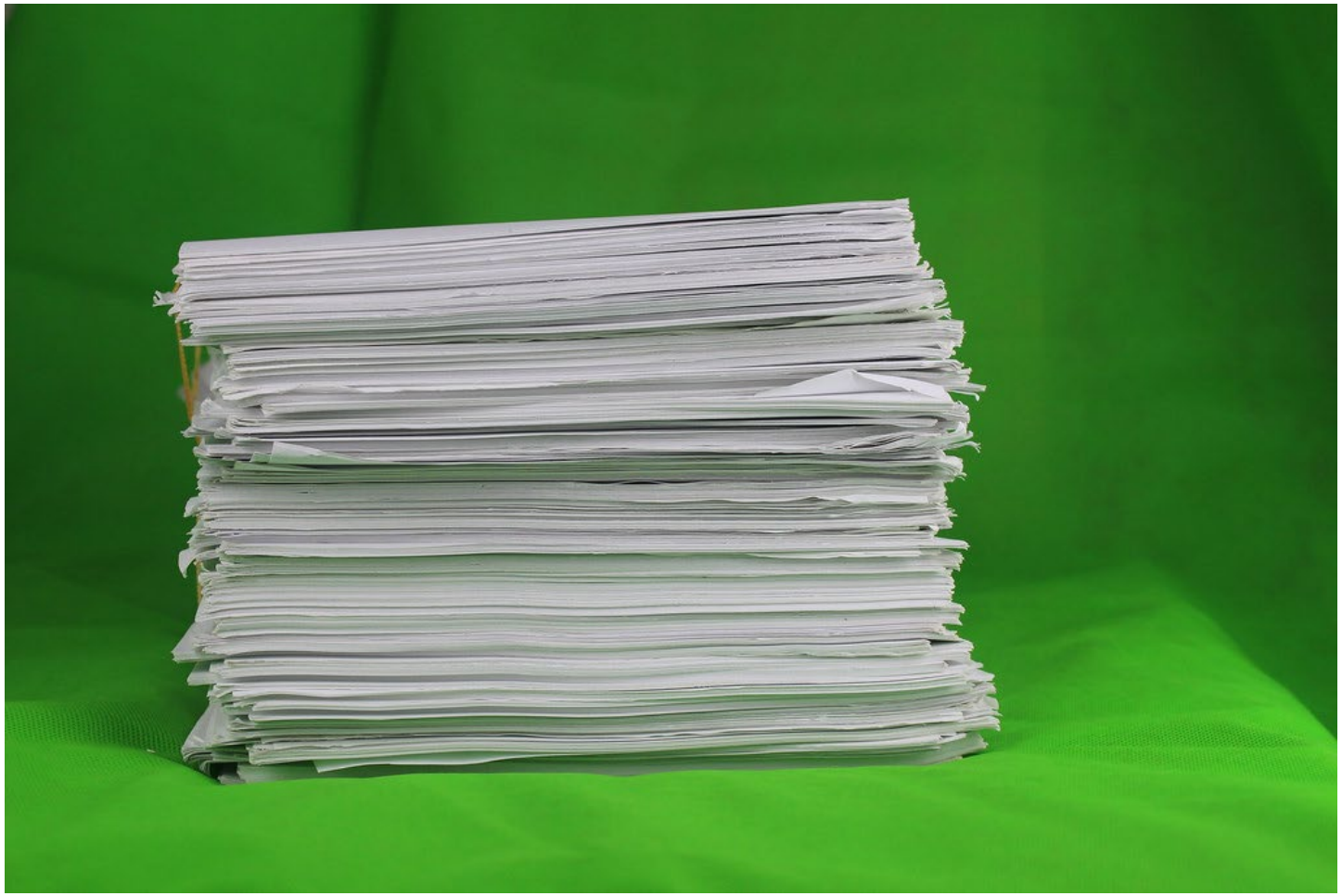
Pitfall #3: Not tailoring communications

- "Curse of knowledge"
- Not accounting for:
  - Knowledge/skill level
  - Constraints and preferences
- Not addressing relevance to people's job duties and lives

> You can produce as many policies and processes as you like. If you cannot communicate them to people in a language they understand, in a language that means they're going to be receptive to your message, then they're worthless.

"It's Scary…It's Confusing…It's Dull": How cybersecurity advocates overcome negative perceptions of security

Pitfall #3: Example



Overturning Pitfalls #1, #2, and #3

1 Empathize, intend to empower

- Realize we're all human
- Try to understand root causes
- Build relationships

2 Be context aware

- Who are your users?
- What's the environment?
- Where are the interaction points and impacts?

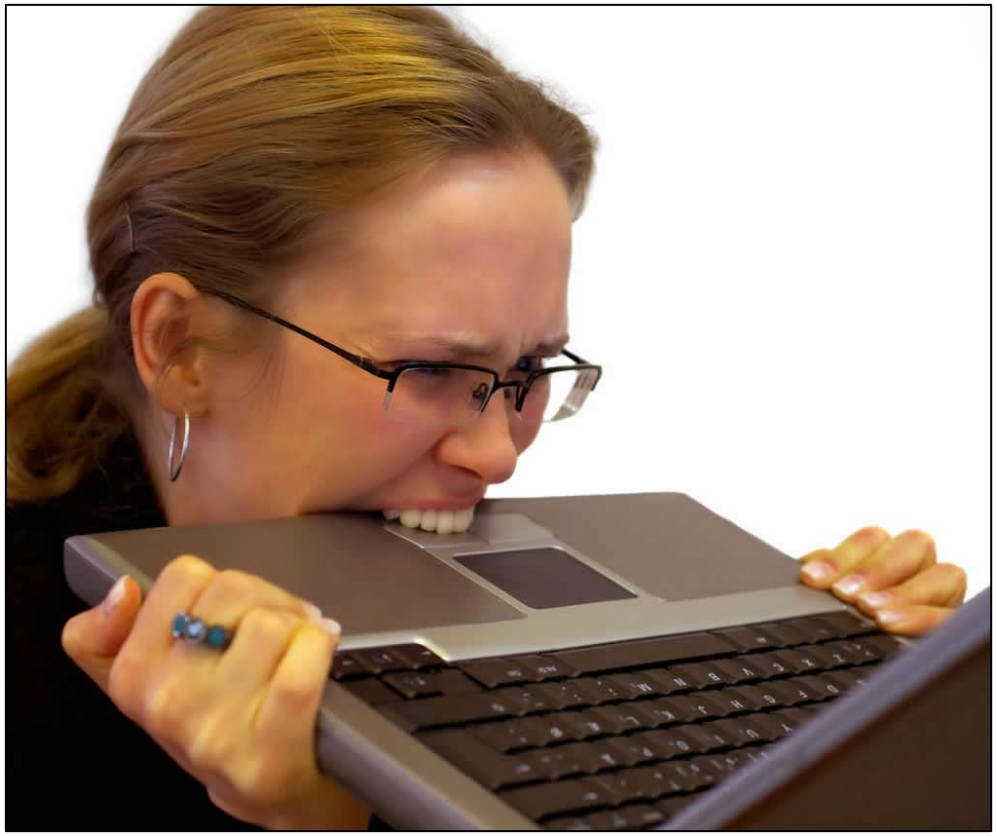
3 Be a translator

- Use appropriate language
- Provide digestible guidance
- Communicate the "why"
- Enlist help

4 Mix it up

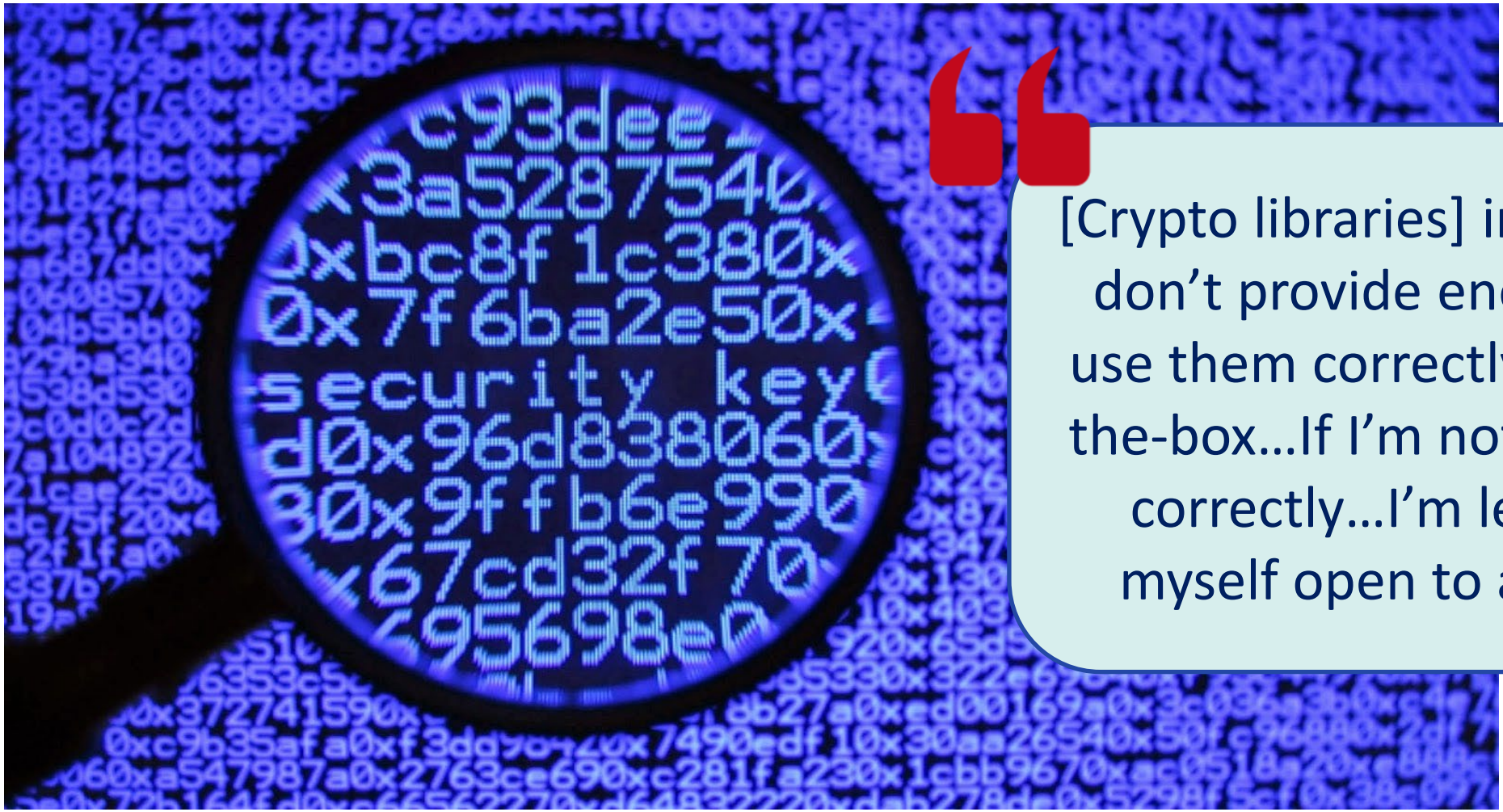
- Use a variety of formats to disseminate information
- Accommodate different preferences and constraints

Pitfall #4: Putting too much burden on users



- Pushing users beyond their limits
  - Time
  - Effort
  - Cognitive load
- Can result in errors, frustration, anxiety

Pitfall #4: Example

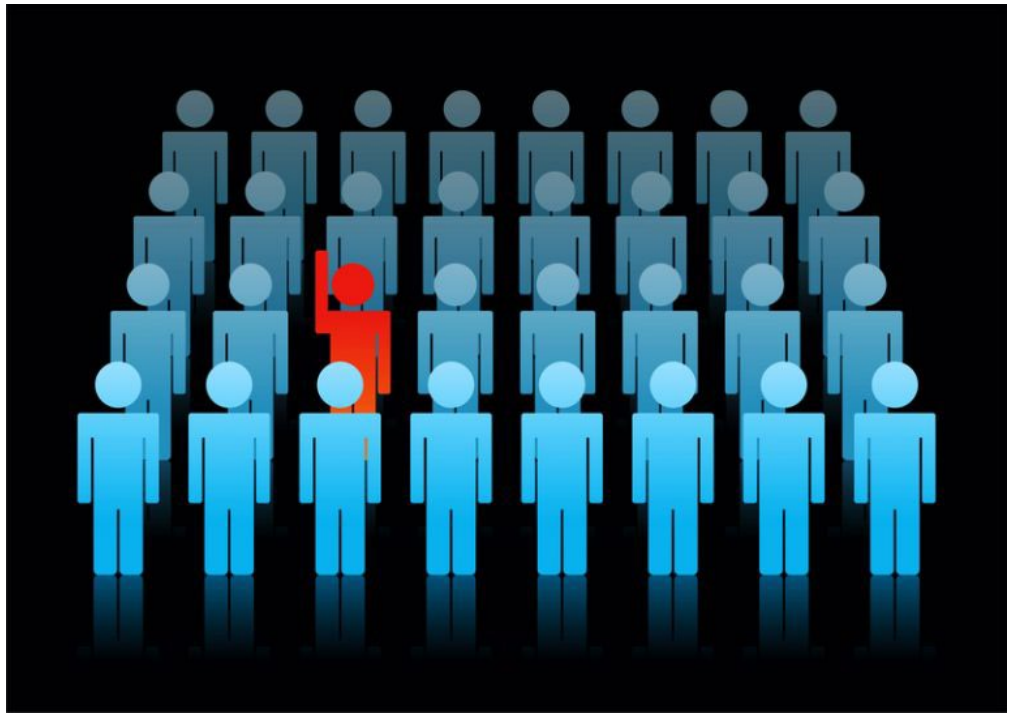


> [Crypto libraries] in general don't provide enough to use them correctly out-of-the-box…If I'm not using it correctly…I'm leaving myself open to attack.

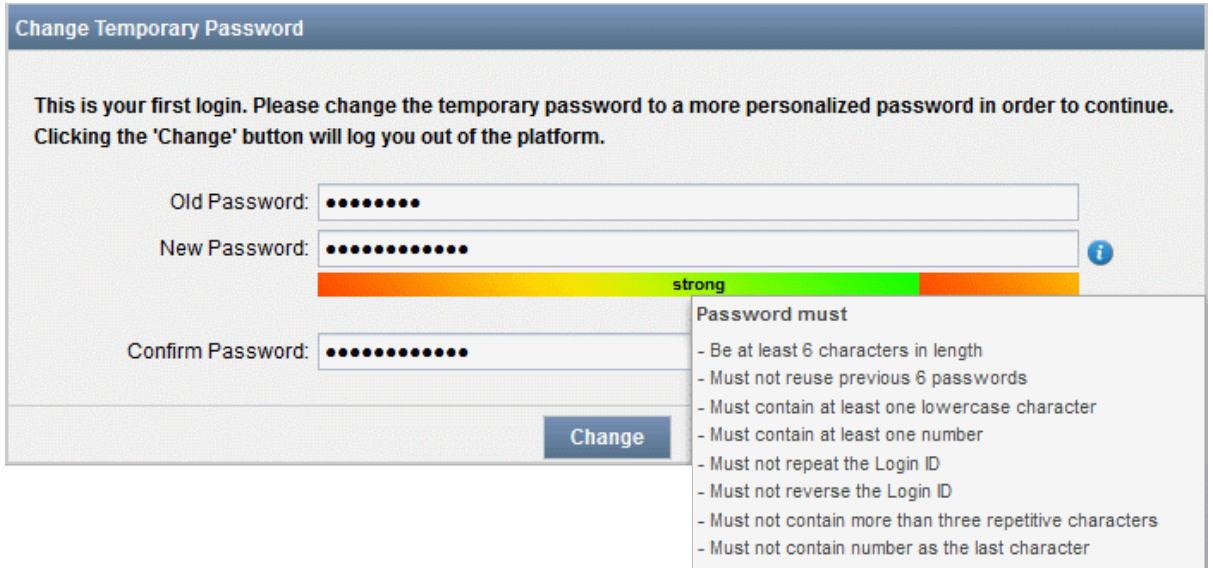
"We make it a big deal in the company": Security mindsets in organizations that develop cryptographic products

Pitfall #5: Making users into insider threats due to poor usability

- Unusable security may backfire
- Stringent security measures may be viewed as counterproductive
- To cope, users may engage in workarounds or make risky decisions



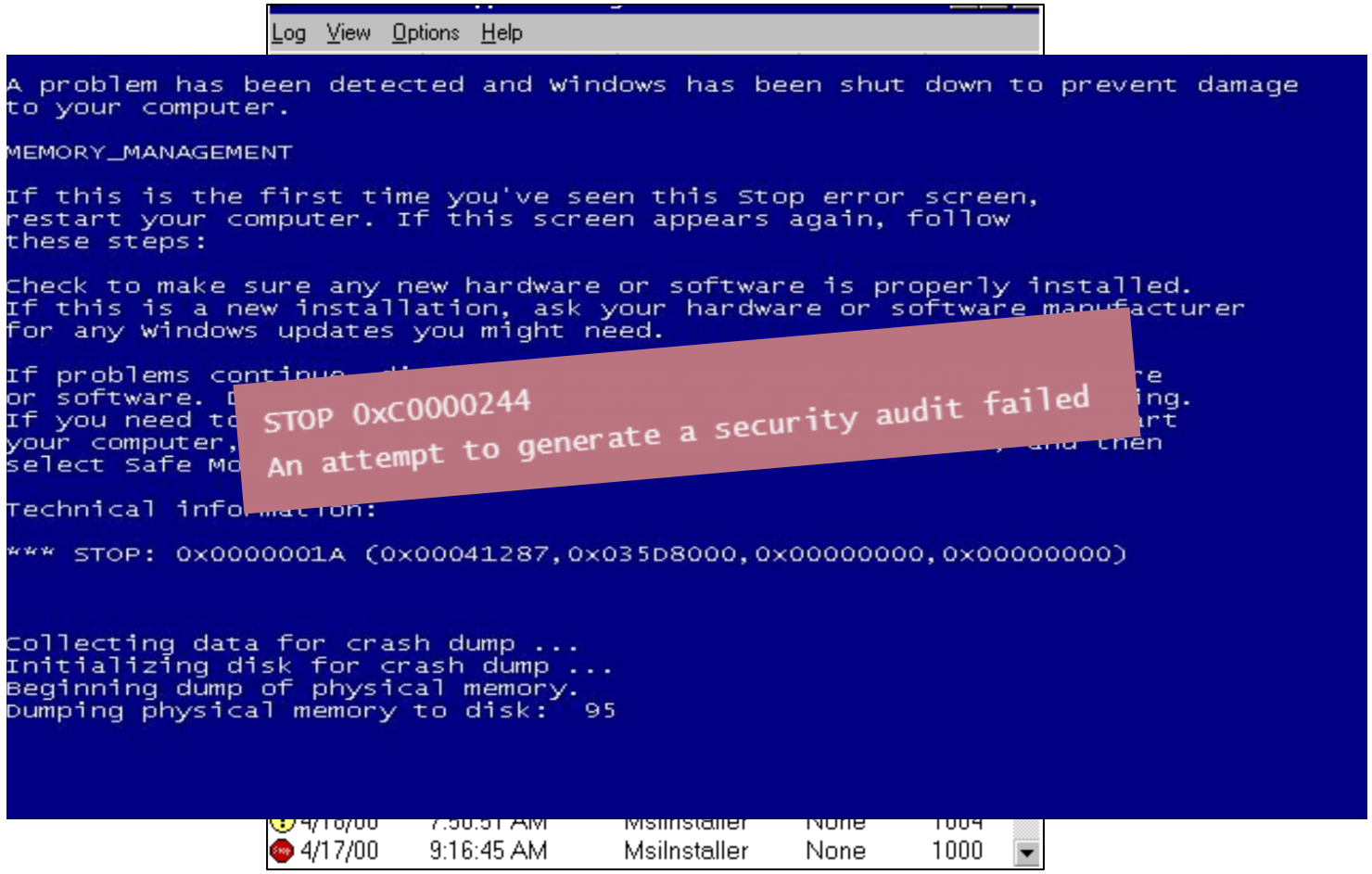
Pitfall #5: Example



Pitfall #6: Assuming the most secure solution is best

- "One-size-fits-all" approach
- High level of security may not be practical or necessary for everyone/all organizations
- May cause unforeseen impacts on users

Pitfall #6: Example



Overturning Pitfalls #4, #5, and #6

1 Conduct basic usability testing

- Pilot proposed solutions
- Observe errors, misinterpretations
- Ask for feedback

2 Make it actionable

- Provide tools and achievable guidance
- Break down into manageable, prioritized chunks

3 Offload burden when possible

- Don’t expect the impossible or difficult
- Offload difficult tasks to computers or those better equipped

4 Take a risk-based approach

- Avoid “one-size-fits-all” solutions
- Tailor to the environment and its security needs

Pitfall #7: Using punitive measures to get users to comply

- Punishing users for security mistakes or lapses
- Negative messaging
- May be counterproductive, turn people off from security

Pitfall #7: Example

Pitfall #8: Not considering user feedback and user-centric measures of effectiveness

- Not seeking out user-centric security indicators/data
- Not incorporating user feedback
- Results in a blind spot about user impacts, behaviors, and attitudes

Pitfall #8: Example

Overturning Pitfalls #7 and #8

1 Don’t rely on fear alone

- Fear doesn’t always prompt action
- Honestly communicate the risk
- Build self-efficacy to take action

2 Be positive

- Recognize good security behaviors
- Be collaborative and instructive rather than punitive

3 Gather user-centric data

- Identify “symptoms” via user-level security incidents, help desk calls
- Get to root cause by going straight to the source
- Encourage feedback

4 Use data to drive improvements

- Incorporate what you found to improve user’s security interactions
- Communicate what was done

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Takeaways

Apply What You've Learned Today

- Next week you should:
  - Think about where you/your colleagues may be falling victim to the pitfalls
  - Start identifying *all* your users and ways in which they may be negatively impacted by security
- In the first three months following this presentation you should:
  - Begin gathering user-centric data to uncover both symptoms and root causes of security issues
  - Devise and execute a repeatable process for obtaining user feedback and piloting new security solutions

Parting Thoughts

You can’t do it alone!

Do your part to consider the human element and empower others to be informed, capable, and active partners in security.

Thank You!

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https://csrc.nist.gov/usable-cybersecurity

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