The NIST Usability Group

Championing the Human in IT

National Institute of Standards and Technology
U.S. Department of Commerce

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TODAY'S PRESENTATION

1	**Who we are**
2	**Our research**
3	**Usability in Public Safety**
4	**NIST Phish Scale**

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Certain commercial entities, equipment, or materials may be identified in this document in order to describe an experimental procedure or concept adequately.

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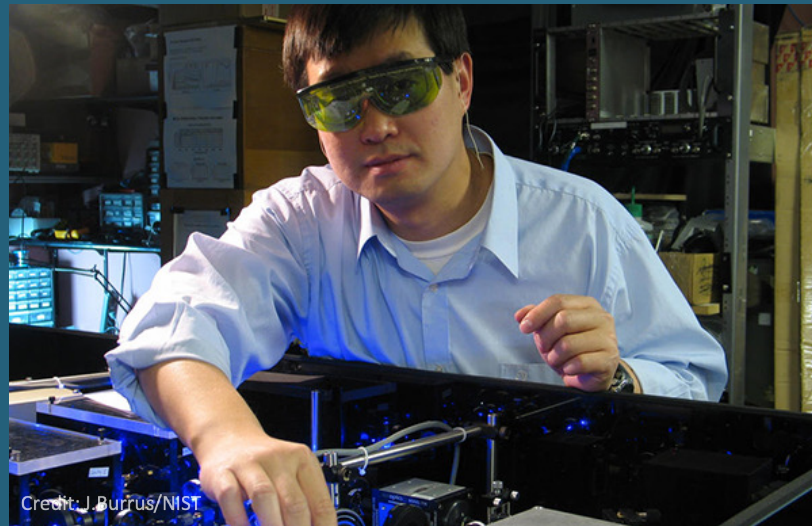
The National Institute of Standards and Technology Research Protections Office reviewed the protocol for this project and determined it meets the criteria for "exempt human subjects research" as defined in 15 CFR 27, the Common Rule for the Protection of Human Subjects.

* Please note, unless mentioned in reference to a NIST Publication, all information and data presented is preliminary/in-progress and subject to change.

Department of Commerce

- Economic Analysis
- U.S. Patent and Trademark Office
- Industry and Security
- National Telecomms. and Information Admin.
- U.S. Census Bureau
- National Technical Information Service
- Economic Development Admin.
- National Oceanic and Atmospheric Admin. (NOAA)
- Economic Affairs
- National Institute of Standards and Technology U.S. Department of Commerce
- Minority Business Development Agency
- International Trade Admin.

MISSION

- **NIST:** To promote U.S. innovation and industrial competitiveness by advancing **measurement science, standards, and technology** in ways that enhance economic security and improve our quality of life

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WHO IS VUG?

Visualization and Usability Group	Championing the Human in Information Technology

Multi-disciplinary
• Computer science
• Cognitive psychology
• Industrial engineering
• Information Security
• HCI & Human Factors
• Usability
	• Performing research to develop user-centered measurement and evaluation methods, guidelines, and standards
	
	• Improving human system interaction by applying:
	   - Human factors,
	   - Cognitive science,
	   - User-centered design, and
	   - Usability principles

CHAMPIONING THE HUMAN IN I.T.

ITL

- Usable cybersecurity & privacy
- Public safety communications research (PSCR)
- ISO — Usability standards
- Biometrics usability
- Other projects: AI usability, voting, Health IT, cloud
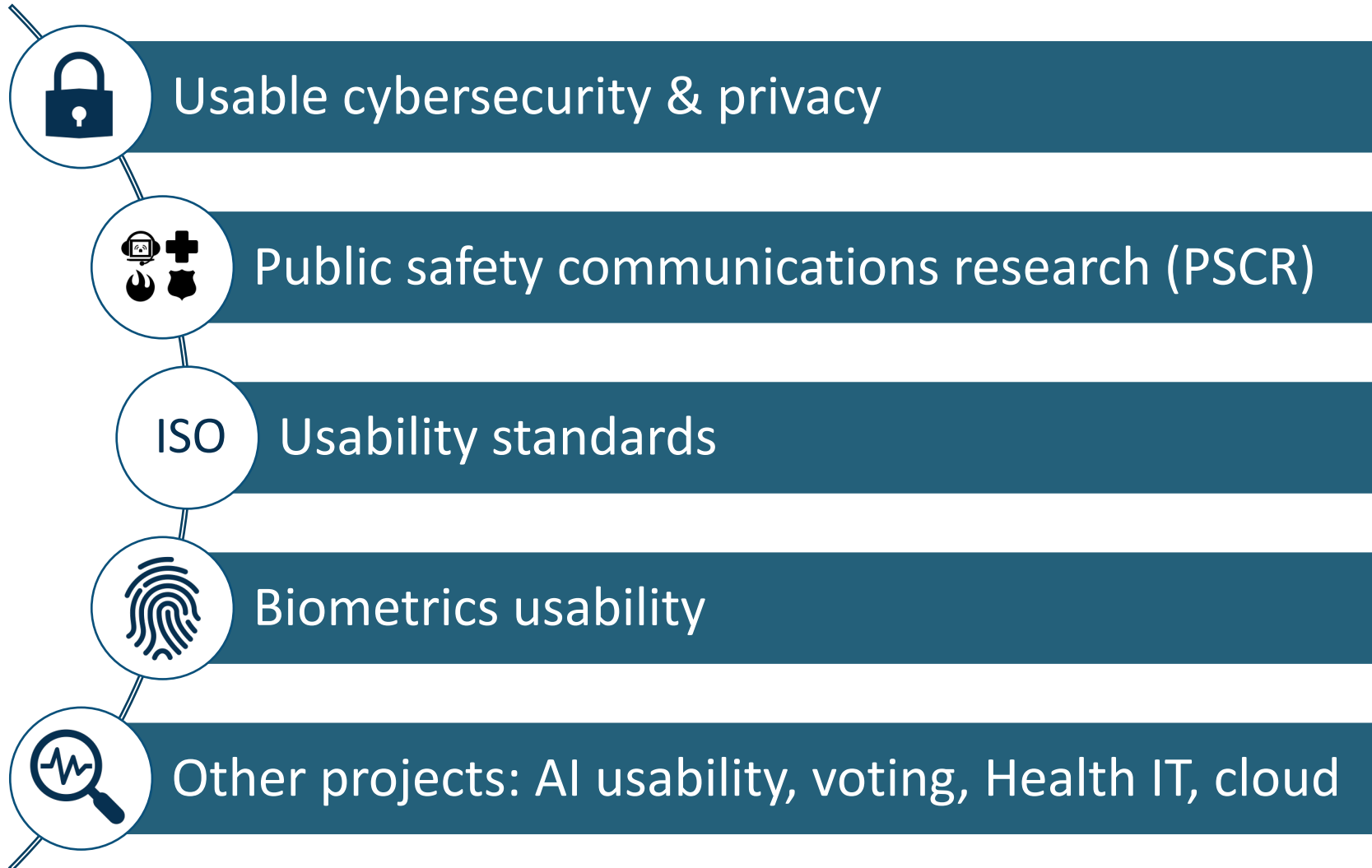
STANDARDS WORK

Usability: The extent to which a system, product or service can be used by specified users to achieve specified goals with *effectiveness*, *efficiency* and *satisfaction* in a specified context of use.

ISO 9241-11:2018

SC7: CIF (Common Industry Format) Usability Standards

SC37: Biometric Standards for Icons & Symbols

SC42: AI Standards

BIOMETRIC USABILITY

Fingerprint Scanner Angle Manipulation Device
- Device for height-angle study
- Accepted as NIST museum artifact in 2018
- On display in NIST Hall of Standards

https://www.nist.gov/itl/iad/visualization-and-usability-group/biometrics-and-usability

AI USABILITY

AI User Trust

AI User Perceptions

PUBLIC SAFETY
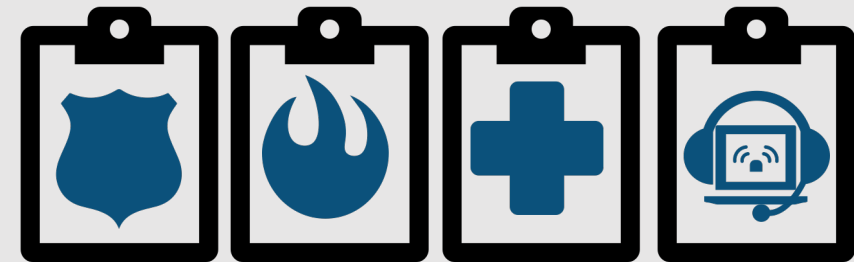# COMMUNICATIONS RESEARCH

Championing the Human in Public Safety

https://www.nist.gov/ctl/pscr/research-portfolios/user-interfaceuser-experience

VOICES OF FIRST RESPONDERS

Understanding User Needs

Phase 1: Nationwide In-Depth Interviews
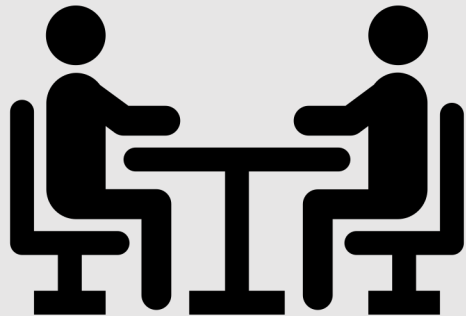
Phase 2: Largescale Nationwide Survey

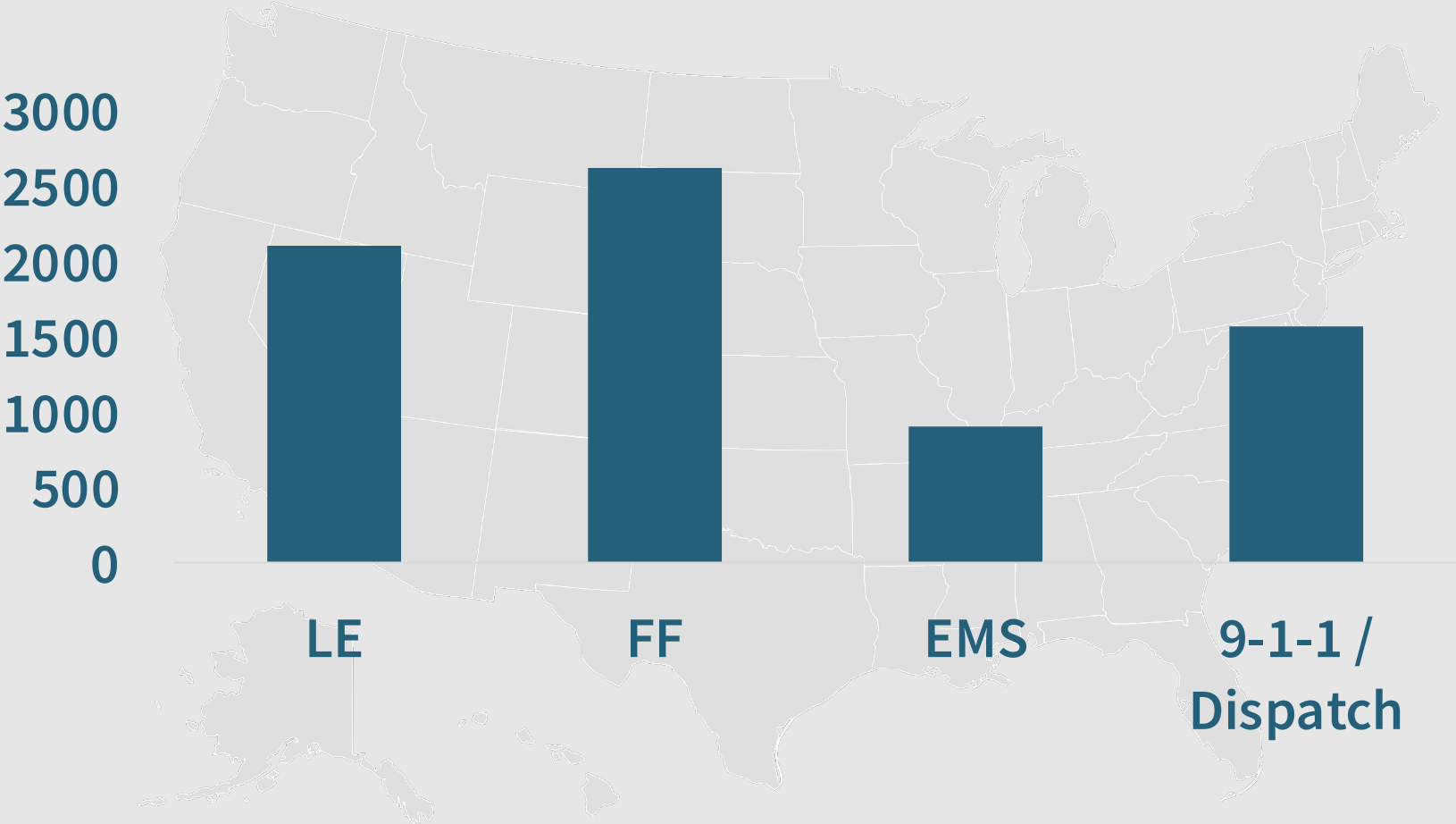# FIRST RESPONDER INTERVIEWS

U - urban
S - suburban
R - rural

14

FIRST RESPONDER SURVEY

Bar chart showing number of respondents by first responder type:
- LE: ~2100
- FF: ~2600
- EMS: ~950
- 9-1-1 / Dispatch: ~1600

Y-axis scale: 0, 500, 1000, 1500, 2000, 2500, 3000
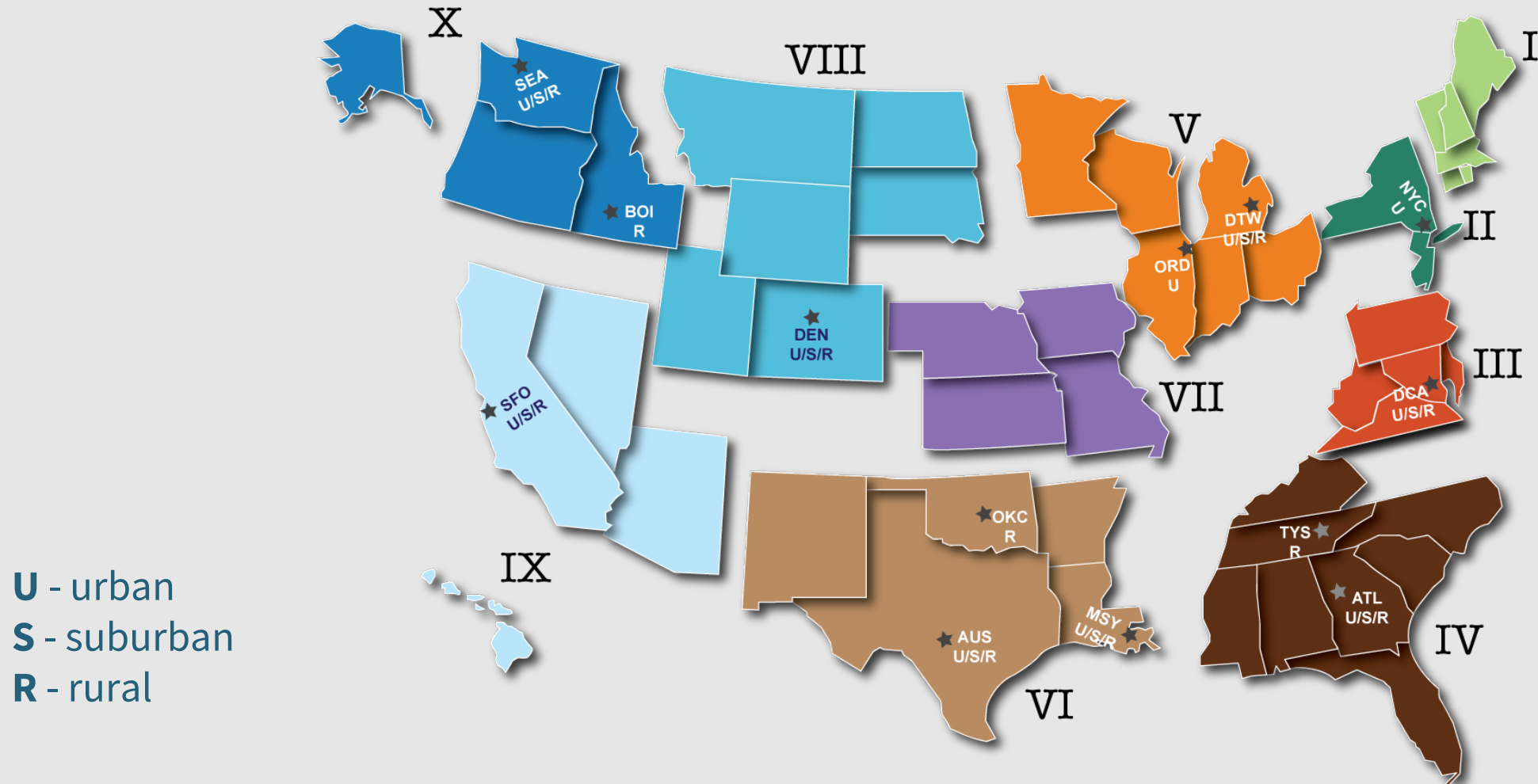
7,182 Respondents

SUMMARY OF FINDINGS

Fix current tech:
It must be usable and reliable

Affordable:
Cost can be a prohibitor for technology adoption

Unique:
Needs and problems may depend on areas and roles

https://publicsafety.nist.gov/

SUMMARY OF FINDINGS

"That's the biggest thing with a lot of the stuff is you make it, but you never test it out on the real person who's going to use it. And then will it get lost in translation, and then it becomes useless. You may have thought it was a great idea. And it might be a great idea, but there's a few tweaks that don't make it useful at all."

(INT-LE-U-036)

First Responders' needs *must* drive all technology R&D
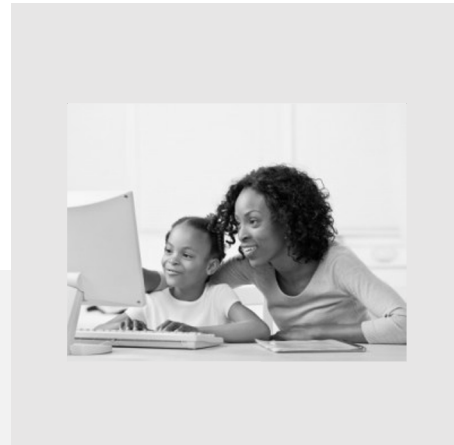
USABLE CYBERSECURITY

Championing the Human in Cybersecurity
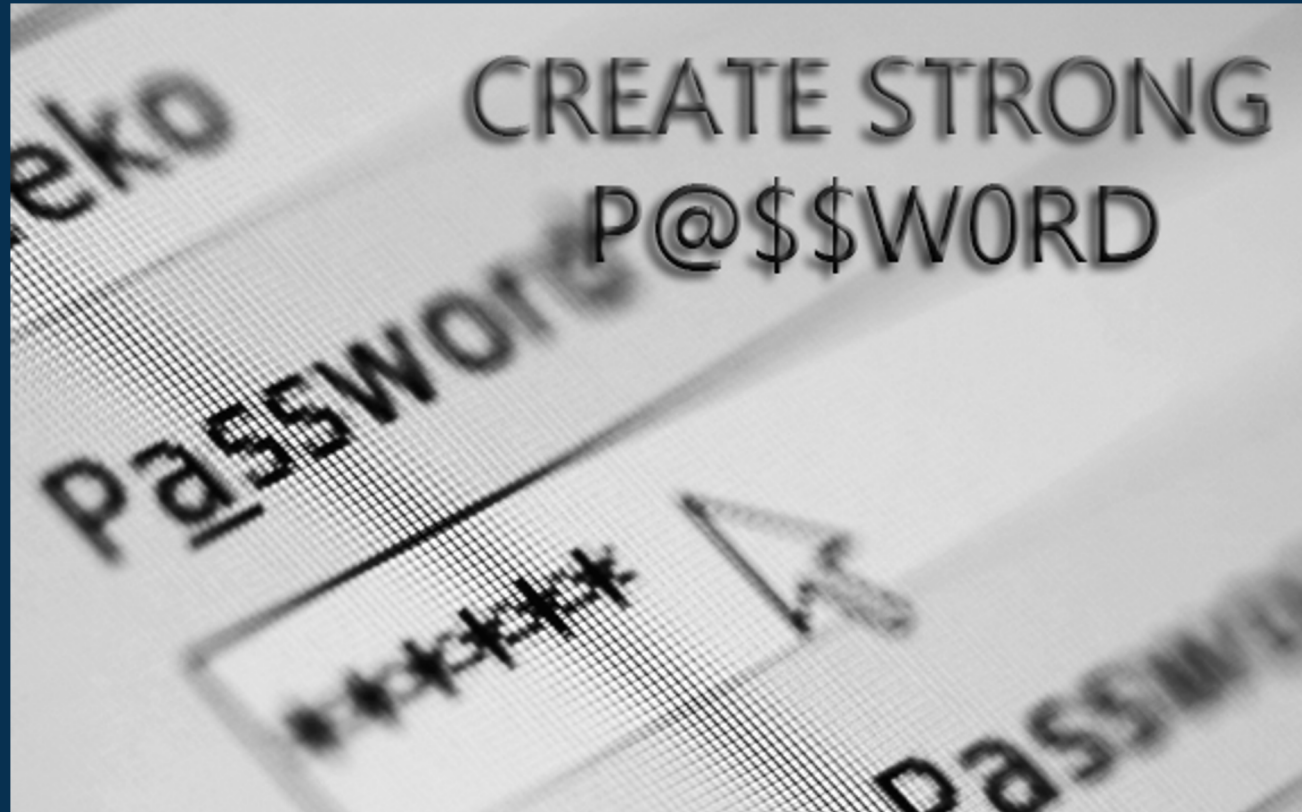
USABLE CYBERSECURITY

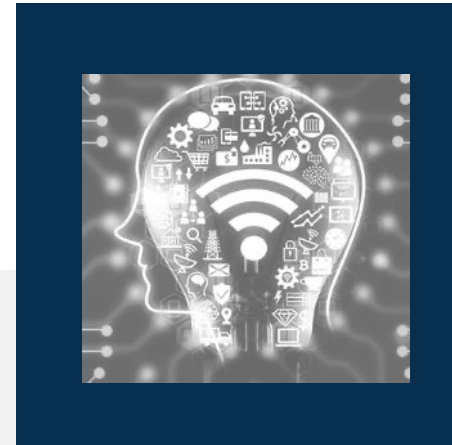*Championing the Human in Cybersecurity*
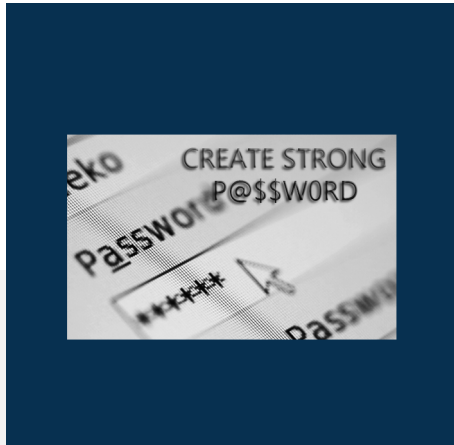
Authentication

- Passwords
- Memory & motor processes
- Mobile authentication

Youth Security & Privacy

- Perceptions of safety, privacy, & security
- Security & privacy practices
- Social influences

Security/Privacy Perceptions & Behaviors

- Experts
- General public
- Data guardians

Cryptographic Development

- Development & testing practices
- Standards & resources
- Challenges

USABLE CYBERSECURITY

Championing the Human in Cybersecurity

Advocacy, Adoption, & Awareness

- Cybersecurity advocates
- Security awareness programs

Small Business Cybersecurity

- Small Business Cybersecurity Corner website design
- Usability testing

Smart Home Security & Privacy

- Concerns & mitigations
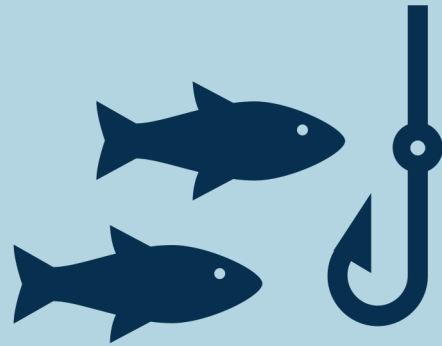- Perceptions of responsibility
- Update experiences

Phishing

- Clickers vs. non-clickers
- Phish Scale

PHISHING THREAT LANDSCAPE

Phishing Threats

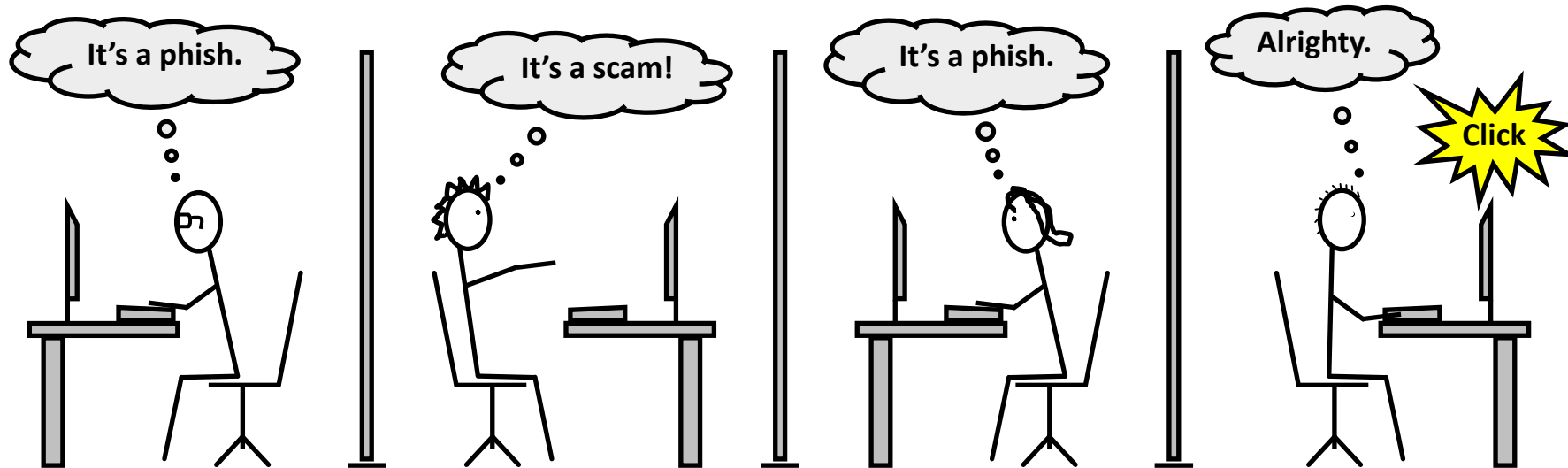Broad cybersecurity email attacks

Spear Phishing

Direct and targeted email attacks
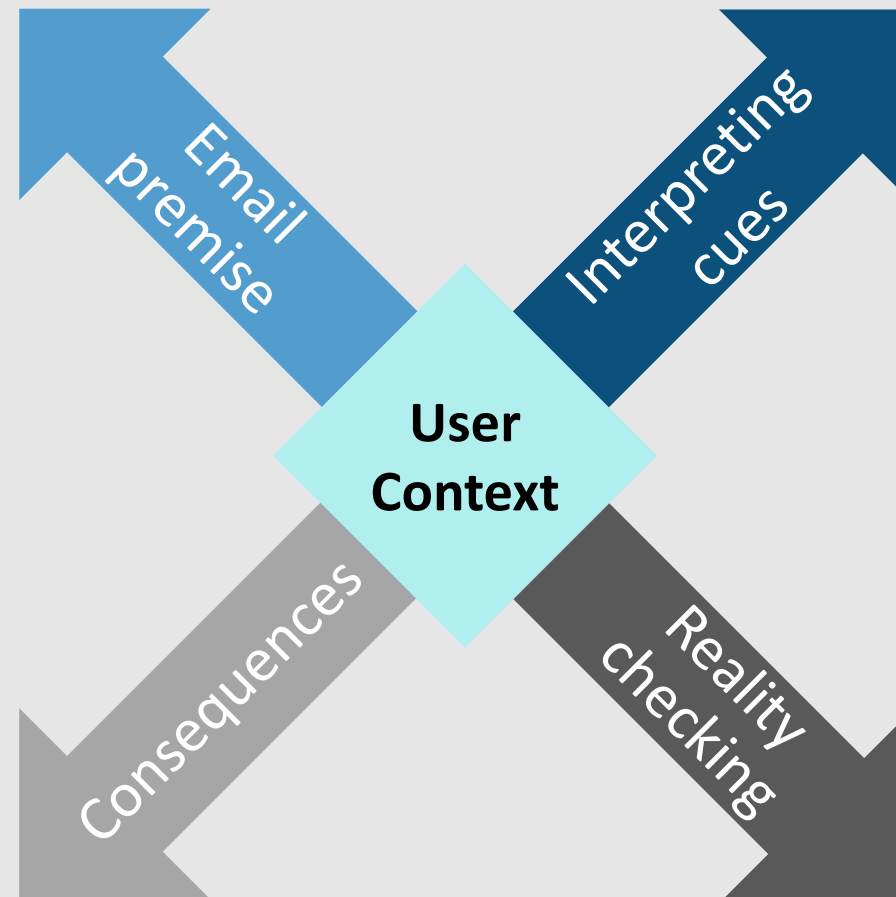
USER CONTEXT IN PHISHING

Alignment vs. misalignment with expectations and external events

Compelling vs. suspicious cues

Email premise

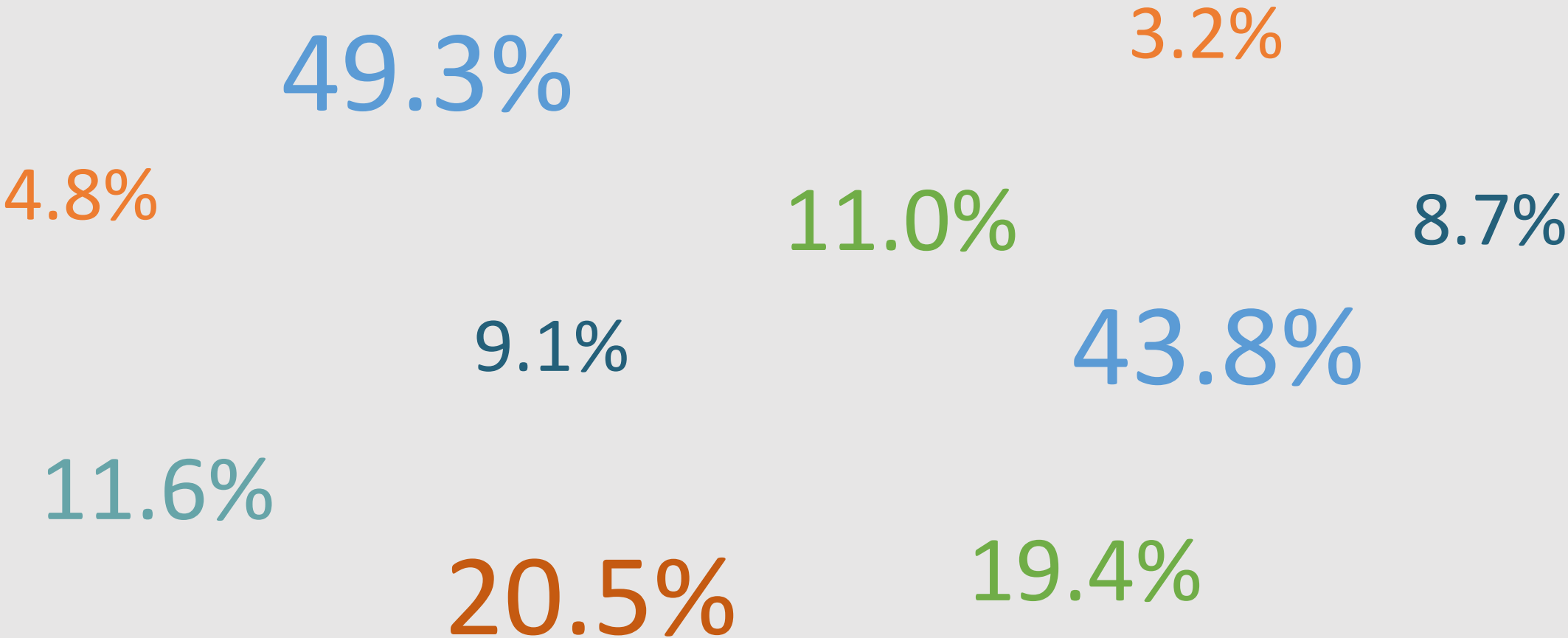Interpreting cues

User Context

Consequences

Reality checking

Concern over consequences

Reality-checking strategies

CONTEXTUALIZING CLICK RATES

49.3%

3.2%

4.8%

11.0%

8.7%

9.1%

43.8%

11.6%

20.5%

19.4%

NIST PHISH SCALE

Image credit: NIST
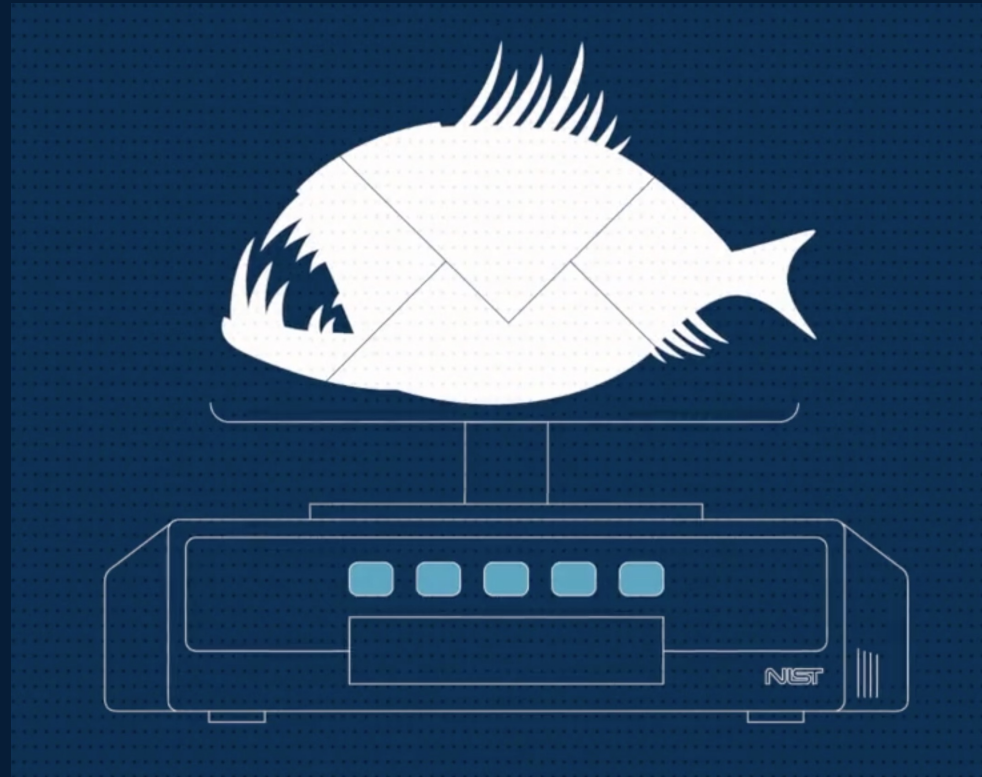
https://www.nist.gov/video/introducing-phish-scale

NIST PHISH SCALE
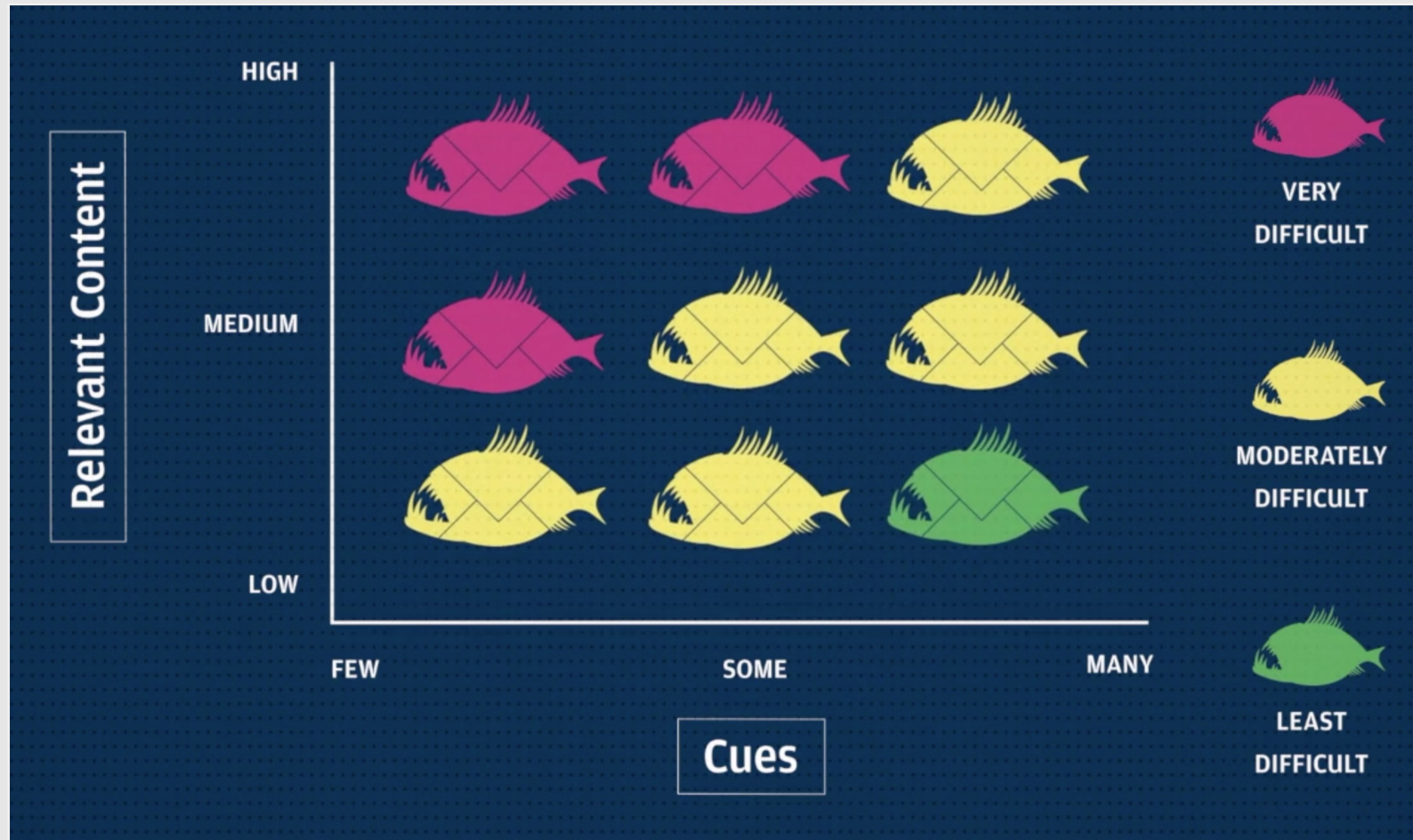

Image credit: NIST

FOR TRAINING IMPLEMENTERS

PROVIDES CONTEXT

The detection difficulty of an email provides needed context to the click rates for a phish.

REDUCES SECURITY RISK

Tailoring training based on characterized phishing threats can reduce the security risk to an organization.

Working with ITL

- Professional Research Experience Program (PREP)

- Summer Undergraduate Research Fellowship (SURF)

- NRC Postdoctoral Research Program

- Pathways Program

- NIST Summer High School Intern Program (SHIP)

https://www.nist.gov/itl/how-work-us

Thank you

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