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Cyber-Attacks: Social Engineering and Phishing

Introduction to Cyber-Attacks

Safeguarding against Phishing in the age of 4th Industrial Revolution
www.cyberphish.eu
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Learning Goals

Explain what is cyber-attack in particular what is phishing attack

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Student Workload

Lecture	0,5 h
Audio and video material	0,5 h
Case studies	0,5 h
Further reading	1 h
Preparation for exam	0,5 h

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Contents

- What are security threats and risk?
- What is phishing attack?
- Phisher’s profile and attack means
- Phishing attack process
- Causes of the phishing attacks

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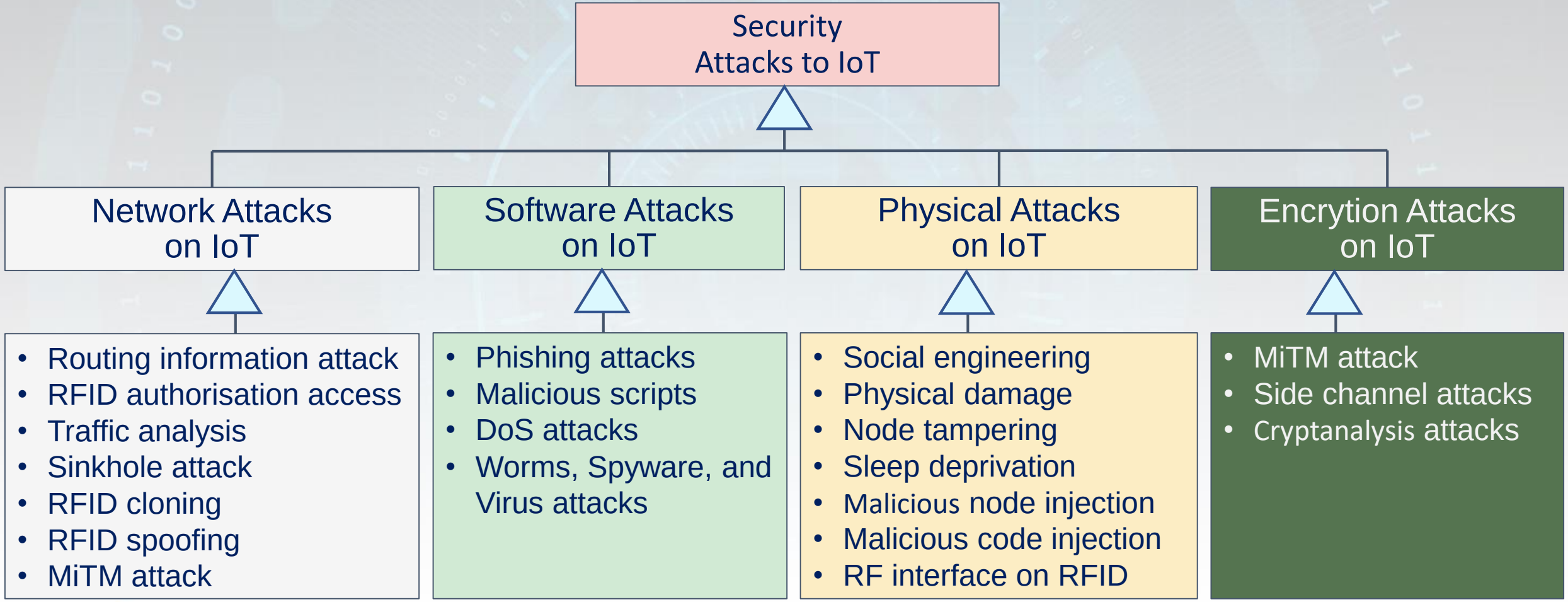
Examples of

Security Threats/ Attacks



[Abiodun et al., 2021]

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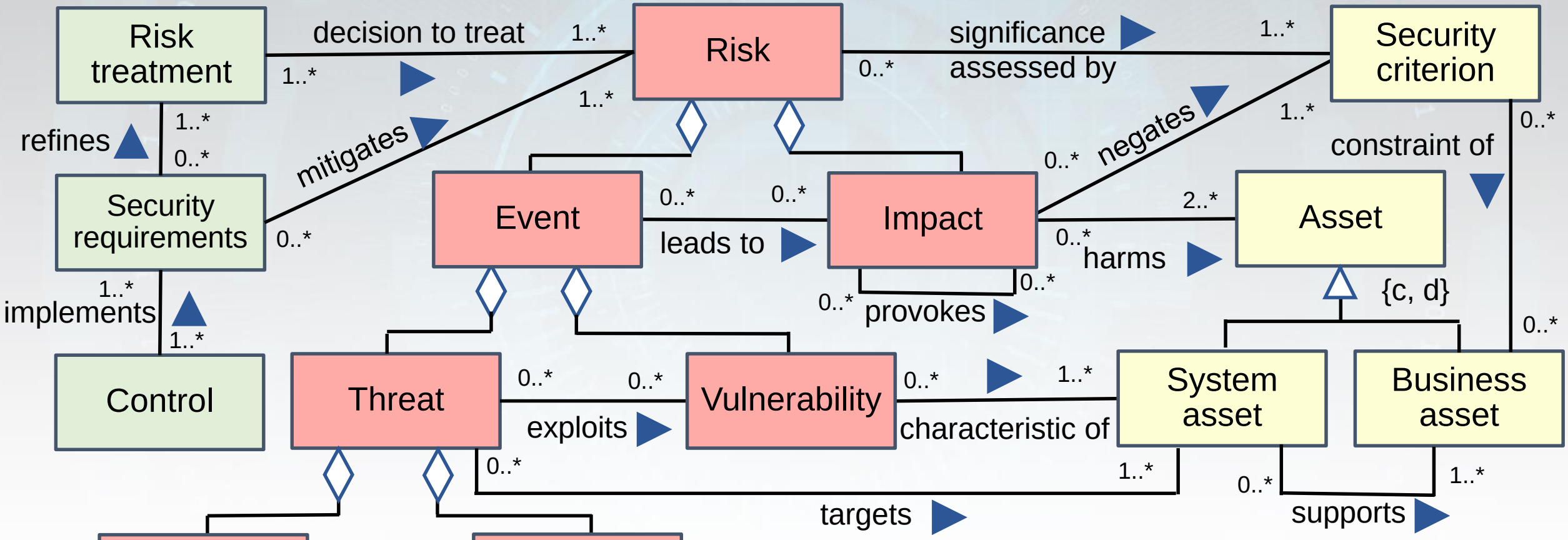
What is a Security Risk?



[Dubois at al., 2010]

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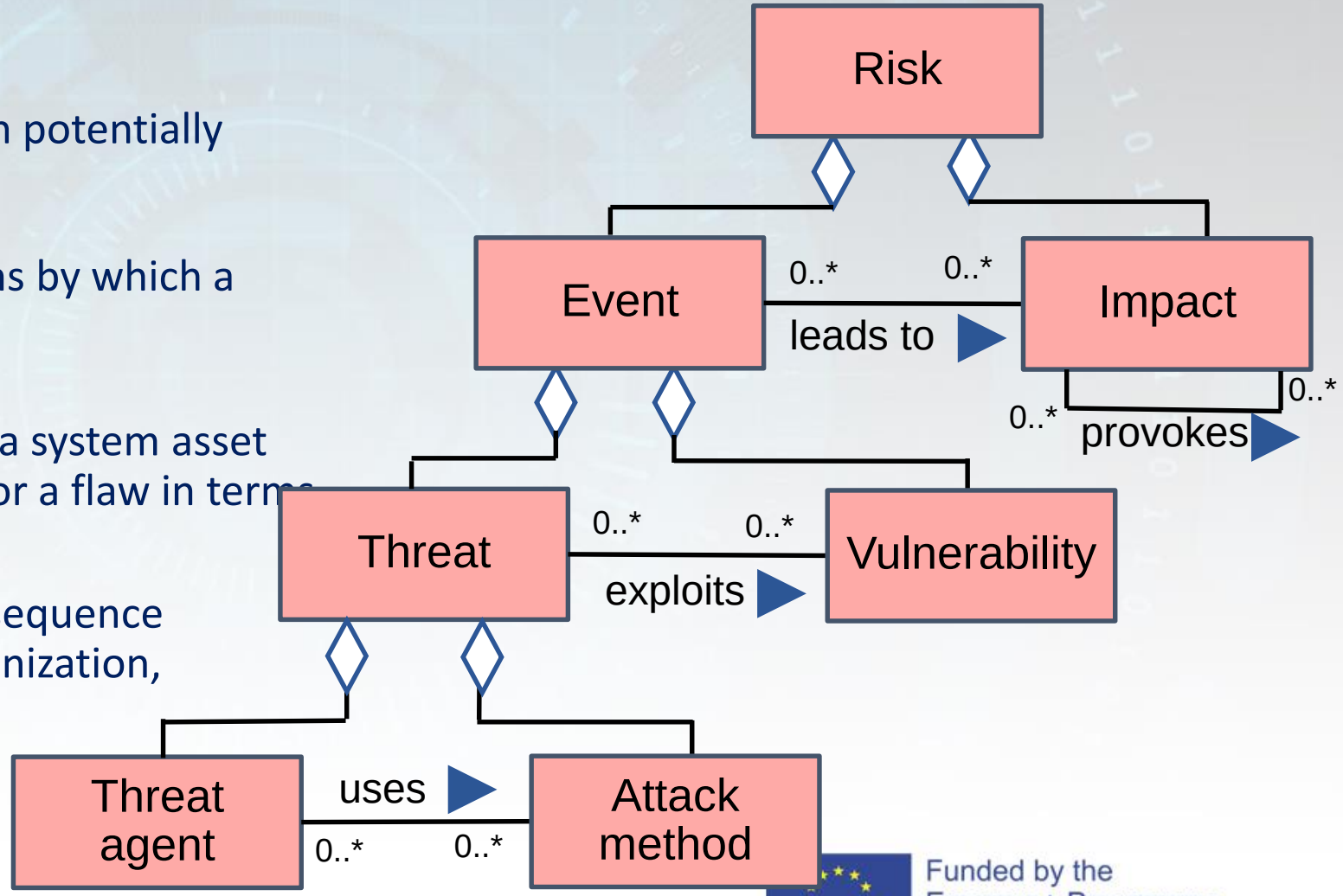
What is a Security Risk?

- **Threat agent** – an agent that can potentially cause harm to system assets
- **Attack method** – standard means by which a threat agent carries out a threat
- **Vulnerability** – characteristic of a system asset that can constitute a weakness or a flaw in terms of system security
- **Impact** - potential negative consequence that may harm assets or an organization, when a threat is accomplished



[Dubois at al., 2010]

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What is a Phishing Attack?

Phishing is *a social engineering scam that can result in data loss, reputational damage, identity theft, the loss of money, and many other damages to peoples and organisations. A phishing scam usually starts with an email trying to gain the potential victim's trust and convince them to take the attacker's desired actions*

[Abroshan, 2021]

Phishing is *a socio-technical attack, in which the attacker targets specific valuables by exploiting an existing vulnerability to pass a specific threat via a selected medium into the victim's system, utilizing social engineering tricks or some other techniques to convince the victim into taking a specific action that causes various types of damages*

[Alkhalil et al., 2021]

What is a Phishing Attack?

Threat agent

Attack method

Vulnerability

Impact

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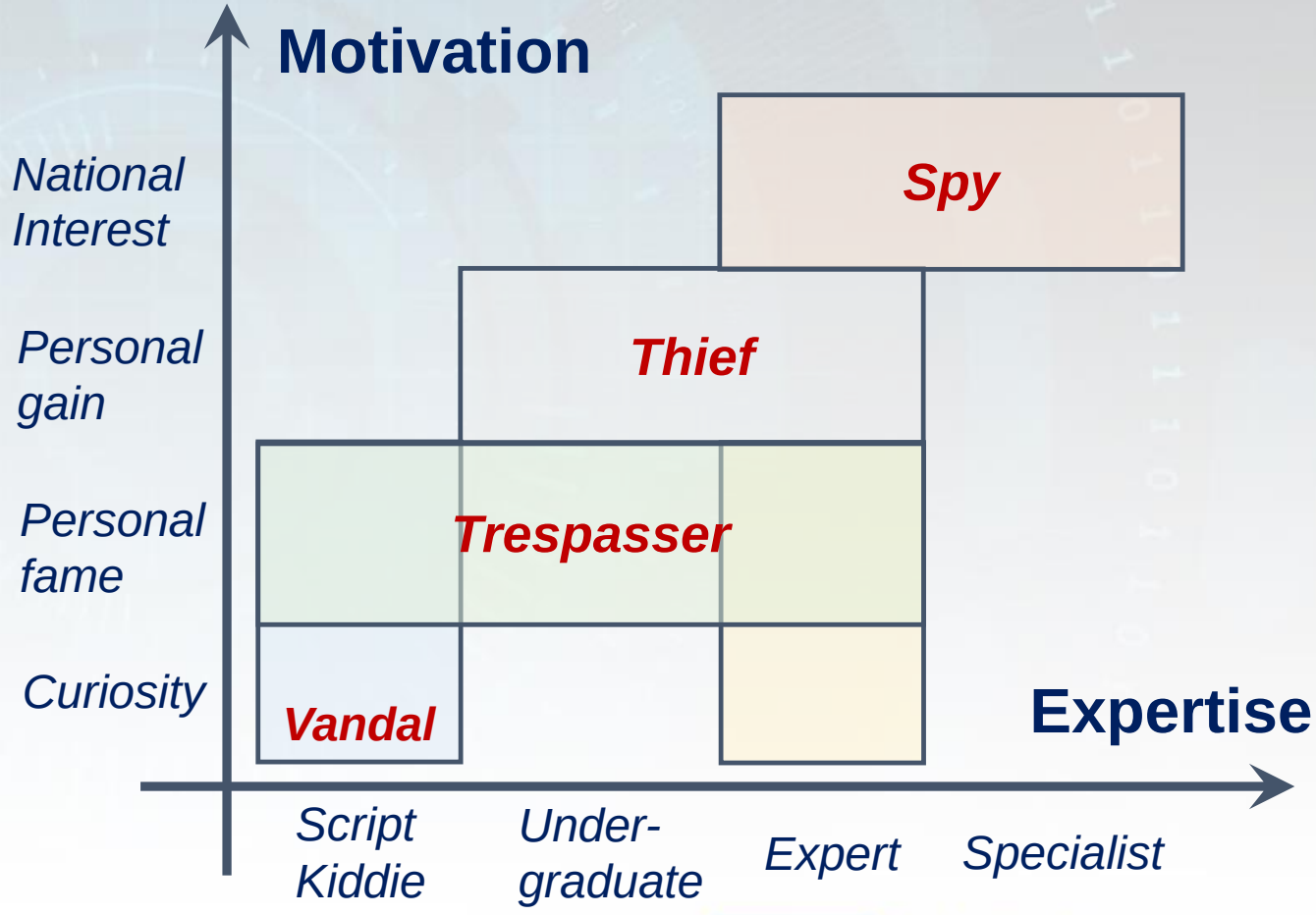
[Alkhalil et al., 2021]

Phisher's Profile

- **Opportunity**
  - *Time to perform a successful attack*
- **Capability**
  - *Hardware*
  - *Software*
  - *Database*
  - *Communication*



[ben Othmane, 2014; Shostack, 2014]

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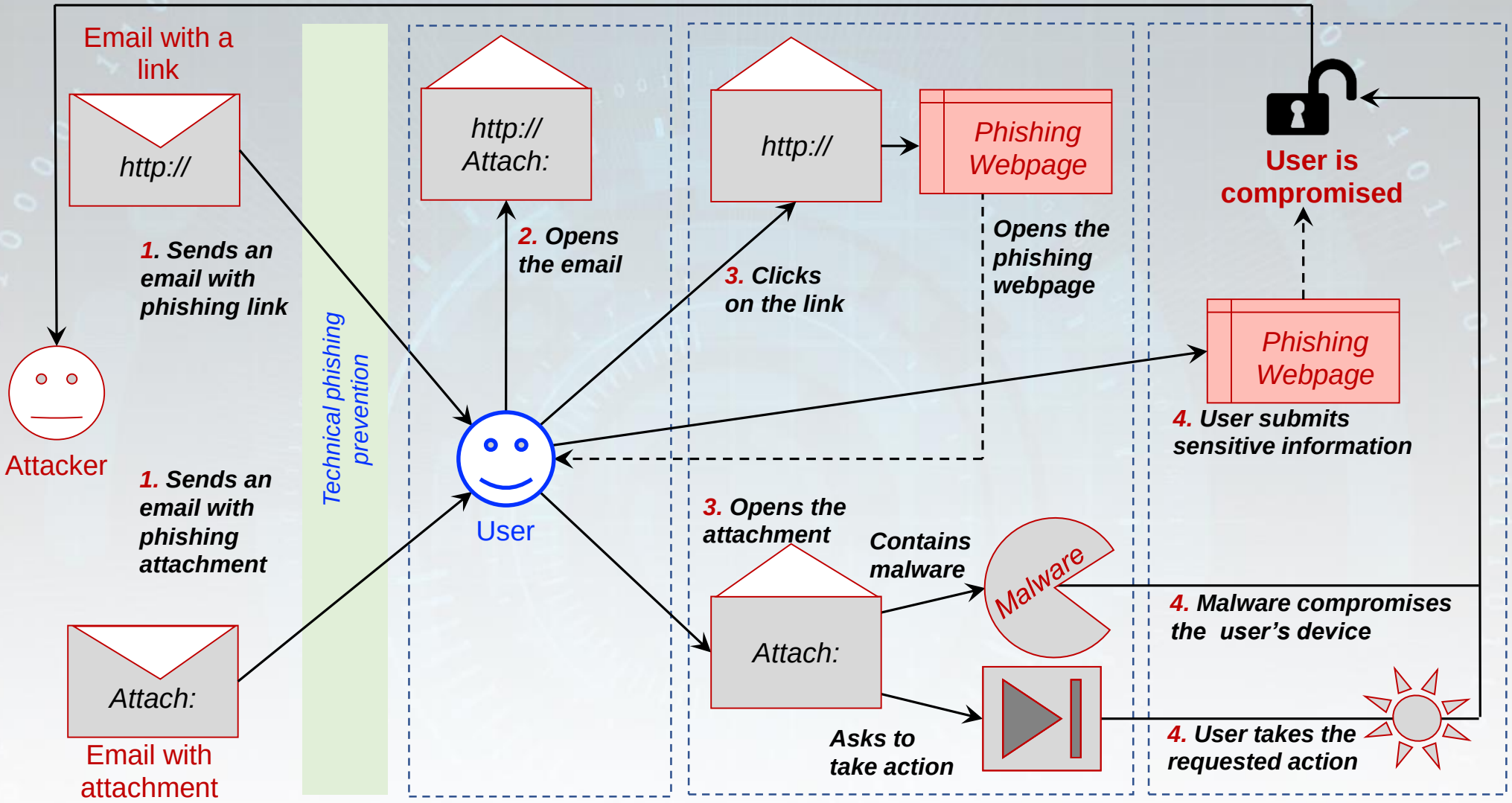
Phishing Attack Process



User opens the phishing email

User clicks on the link

User submits sensitive information

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[Abroshan et al, 2021]

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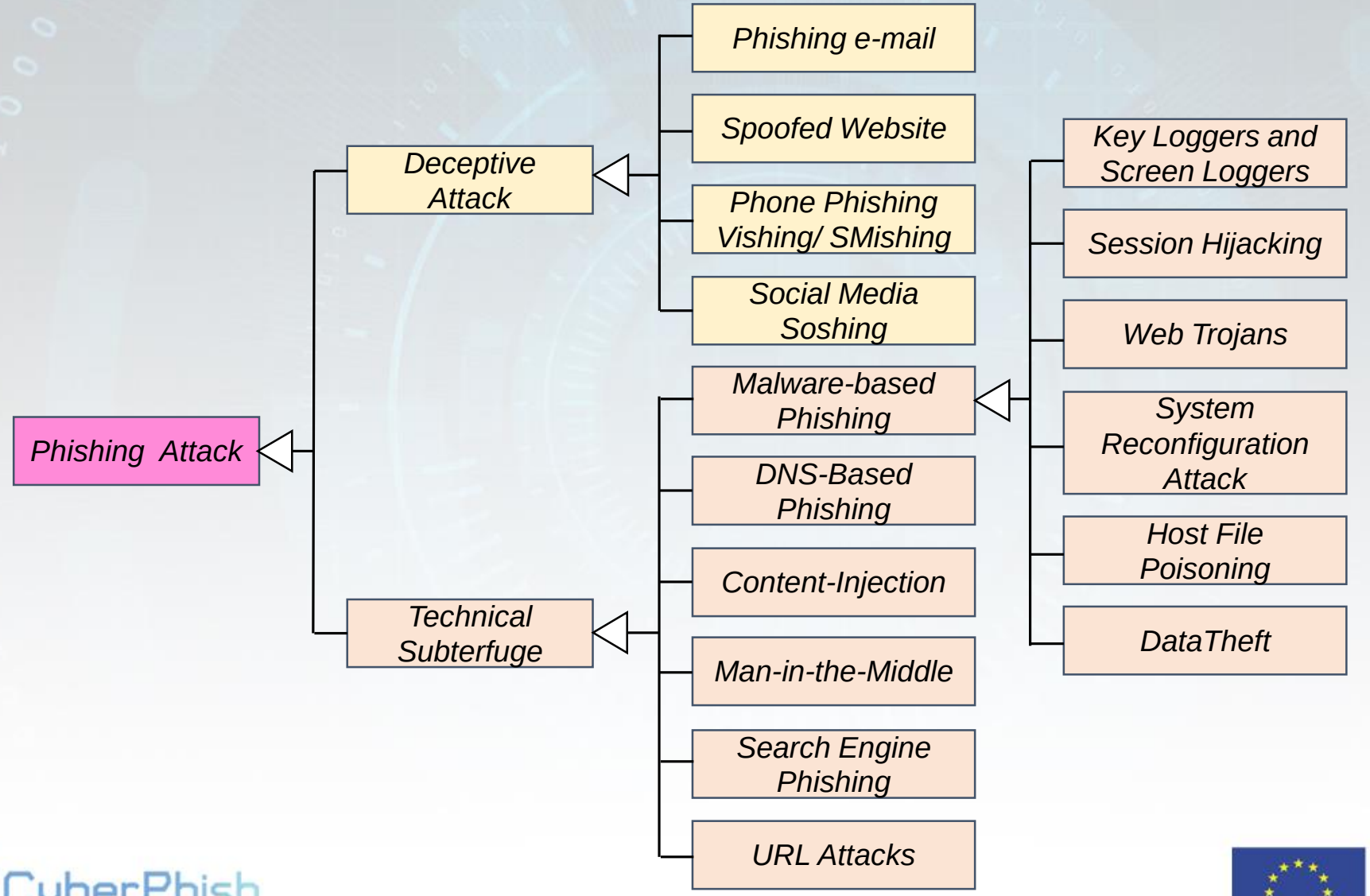
Phishing Attack Means



[Alkhalil et al., 2021]

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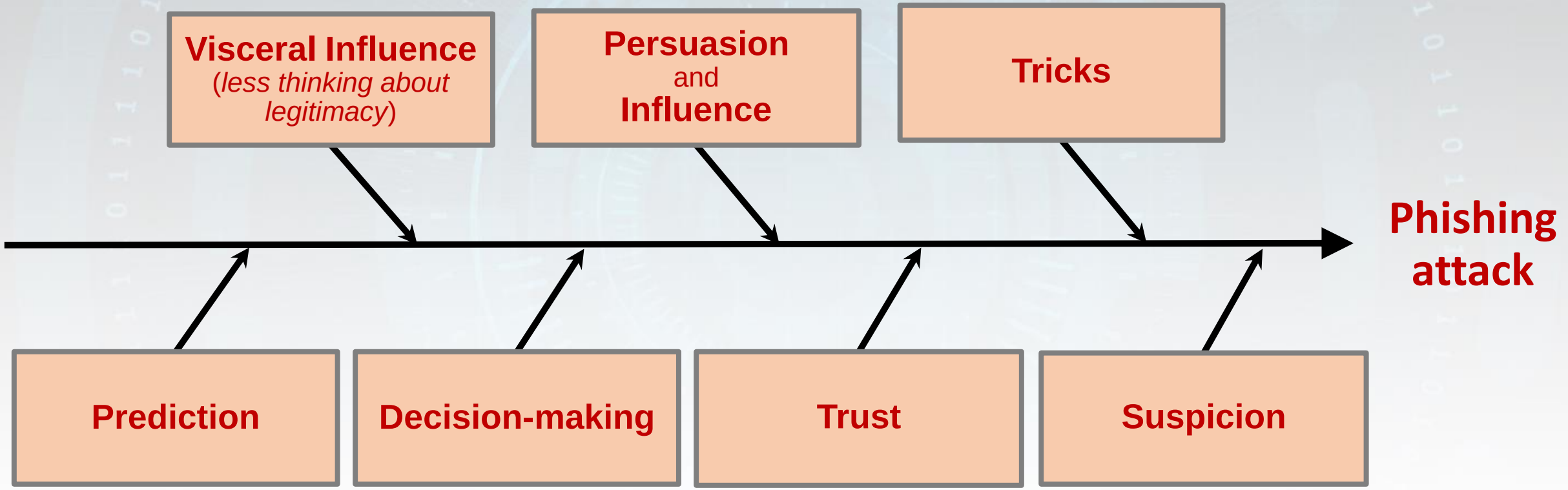
Phishing Attack Root Causes



[Abroshan et al, 2018]

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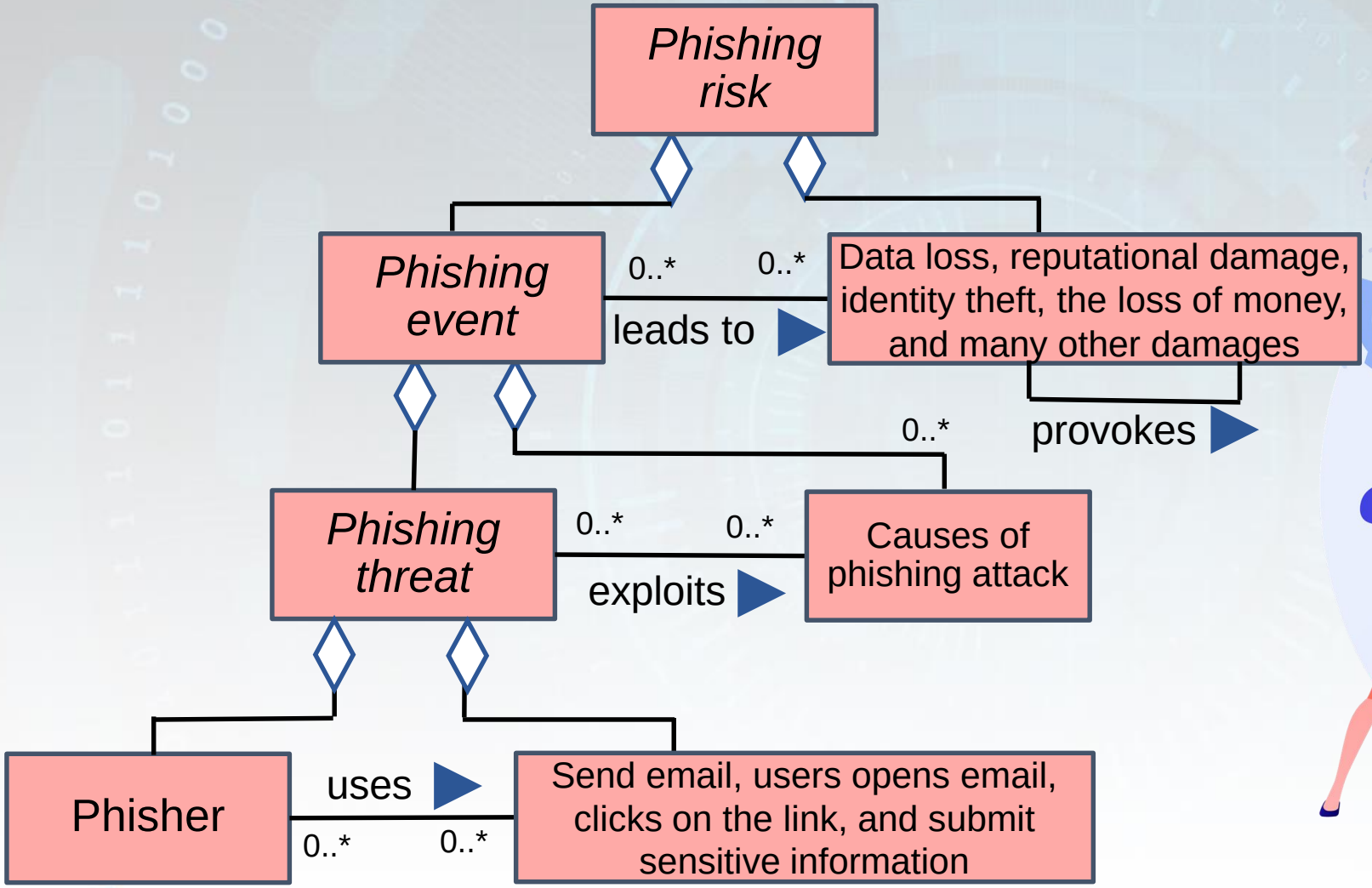
Summary



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Assignments

- Discuss what are the dependencies between the phishing attacks and other cybersecurity attacks
- Discuss what are the causes of the Phishing attacks

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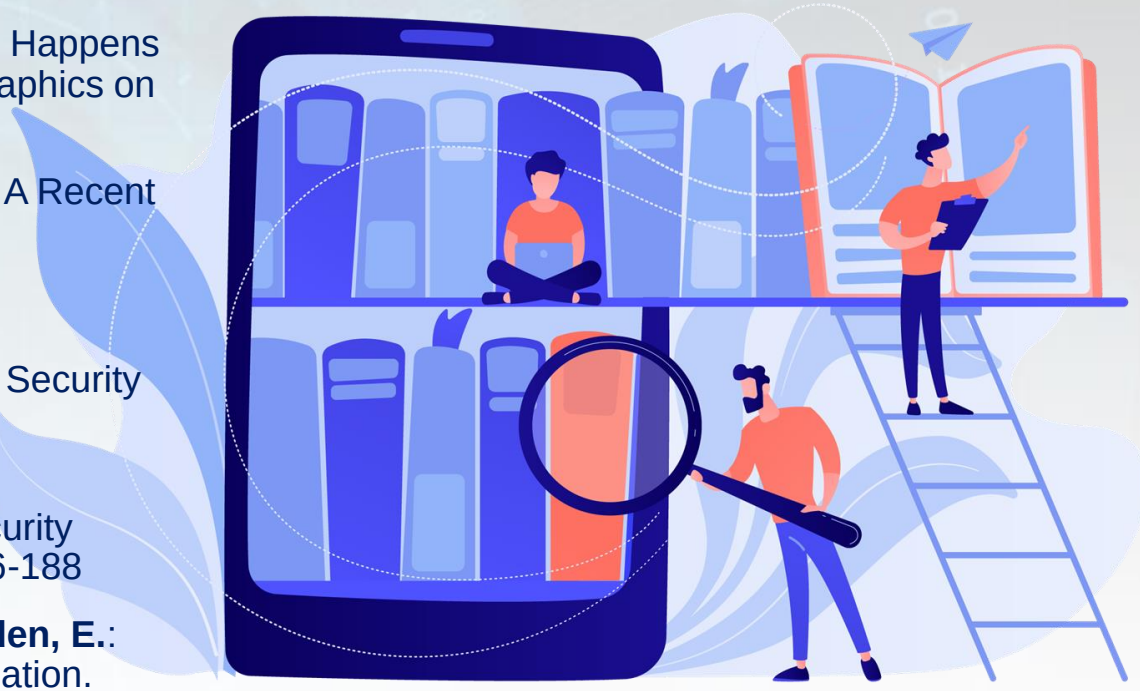
Further Reading

Material used in preparation of this lecture

- **Abroshan, H., Devos, J., Poels, G., Laermans, E.** (2017) Phishing Attacks Root Causes. *LNCS 10694, pp. 187-202, Springer*
- **Abroshan, H., Devos, J., Poels, G., Laermans, E.** (2021) Phishing Happens Beyond Technology: The Effects of Human Behaviours and Demographics on Each Step of a Phishing Process. *IEEE Access, 9, 44928- 44949.*
- **Alkhalil Z., Hewage C., Nawaf L., Khan I.** (2021) Phishing Attacks: A Recent Comprehensive Study and a New Anatomy, *Front. Comput. Sci., 09 March 2021*
- **Dubois E., Heymans P., Mayer N., Matulevičius R.** (2010) A Systematic Approach to Define the Domain of Information System Security Risk Management. *Intentional Perspectives on Information Systems Engineering 2010: 289-306*
- **Iqbal M., Matulevičius R.** (2019) Blockchain-Based Application Security Risks: A Systematic Literature Review. CAiSE Workshops 2019: 176-188
- **ben Othmane, L., Ranchal, R., Fernando, R., Bhargava, B., Bodden, E.**: (2014) Incorporating attacker capabilities in risk estimation and mitigation. *Comput. Secur. 51, 41–61*
- **Shostack, A.** (2014) Threat Modeling: Design for Security, *Wiley, New York*



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Short Videos

- Common Cybersecurity Threats
  - ***https://youtu.be/Dk-ZqQ-bfy4***
  - ***https://youtu.be/GI6LohArXFk***
- What is phishing?
  - ***https://youtu.be/Y7zNlEMDmI4***
  - ***https://youtu.be/9TRR6lHviQc***
- Common types of phishing attacks
  - ***https://youtu.be/Q2HzEUEhRT0***
  - ***https://youtu.be/rb26NK0jtHM***

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Thank you!