SOCIAL ENGINEERING: TOWARDS A USER INTROSPECTIVE COUNTERMEASURE APPROACH

University of the Cumberlands

Miguel Buleje, Ph.D.

Ulrich Vouama, Ph.D.

Agenda

- Intro & Fundamentals of Social Engineering
- Social Engineering Taxonomy & Human Factors
- Implications of Human Personality & Persuasion Strategies
- User Introspective Countermeasure Approach (UIAC)
- Defense Recommendations

Fundaments of Social Engineering

Attack Classification & Types

- Multiple Classifications and Categories presented in the literature
- Social, Technical, and Physical-based attacks, Salahdine & Kaabouch (2019)
- Human-based or Computer-based Classes, Peltier (2006).

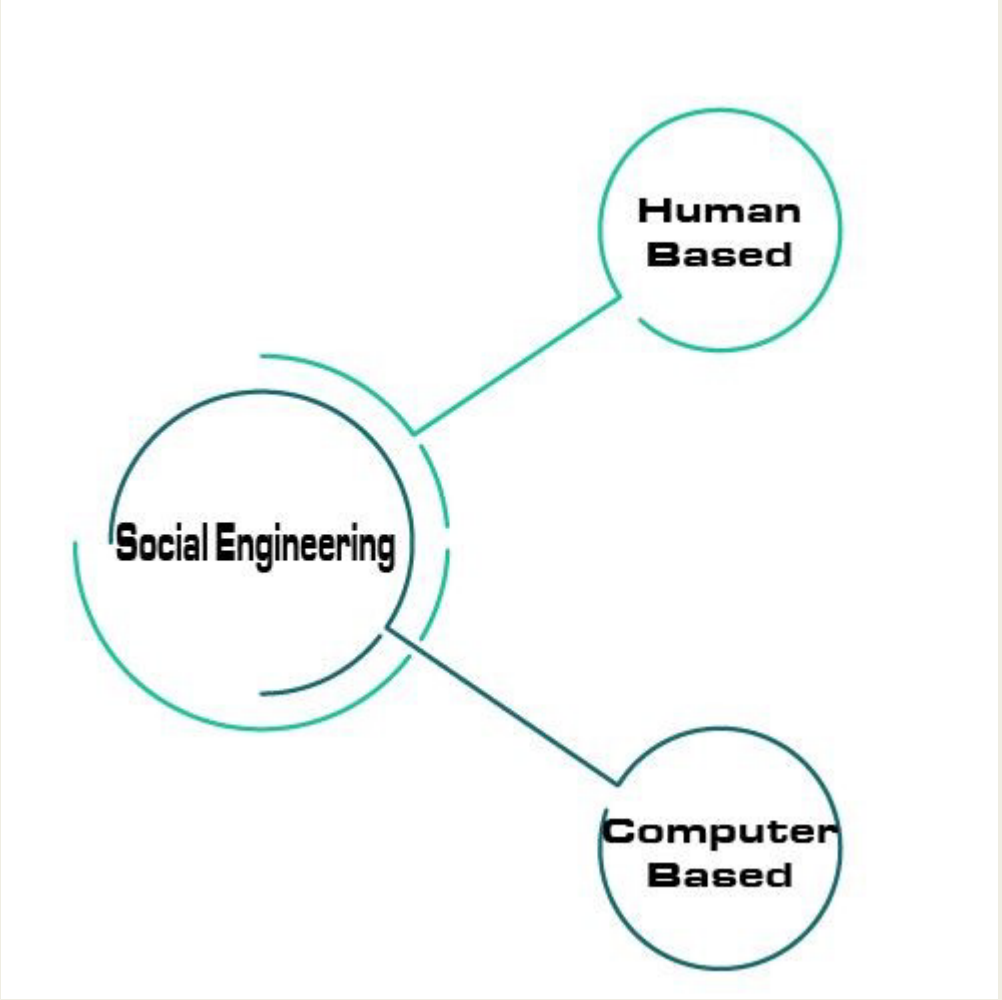


Figure 1: Type of Social Engineering Attacks, adapted from Peltier (2006).

Lifecycle of Social Engineering

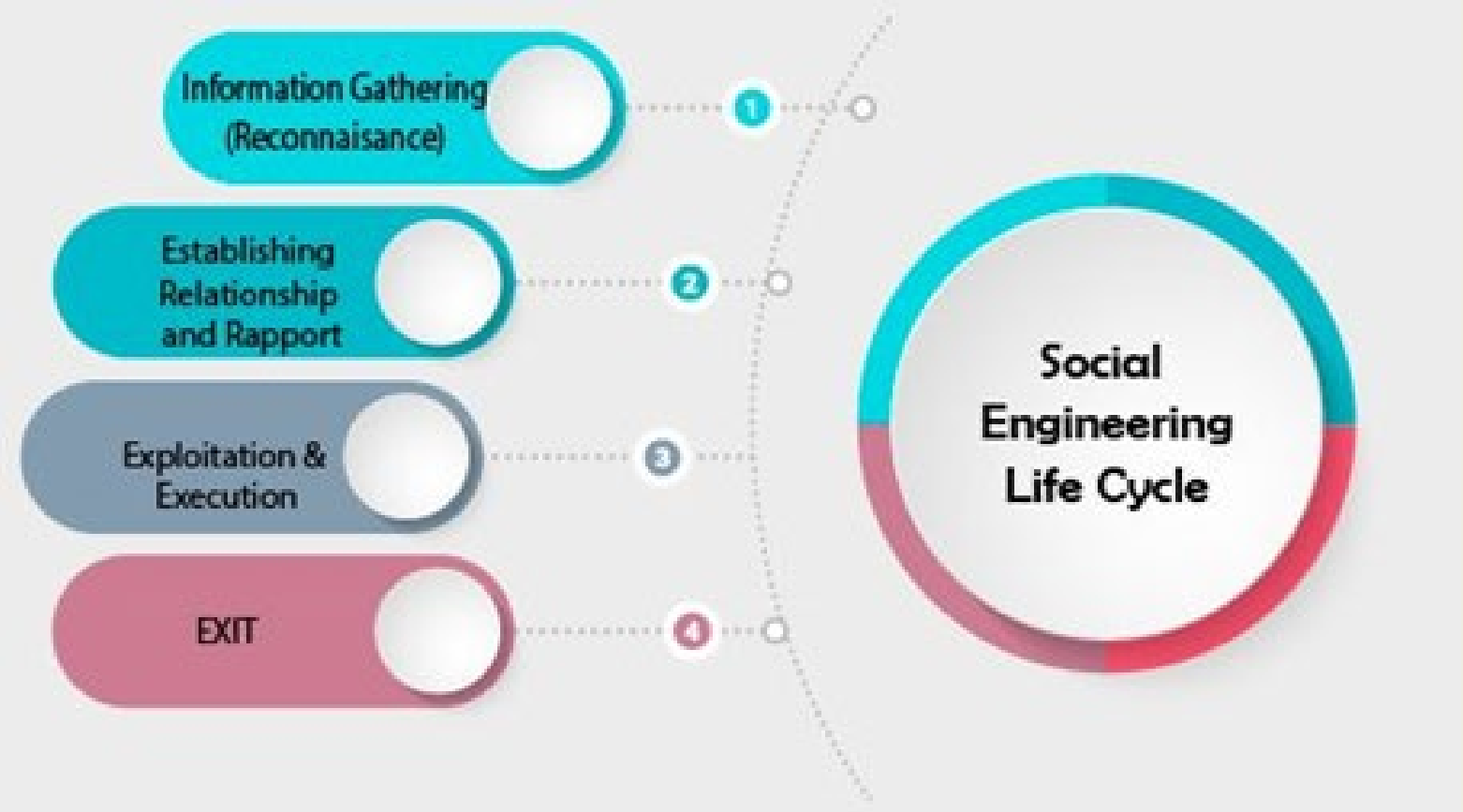


Figure 2: Social Engineering Attack Stages. Adapted from Salahdine and Kaabouch (2019).

Classification of Vectors

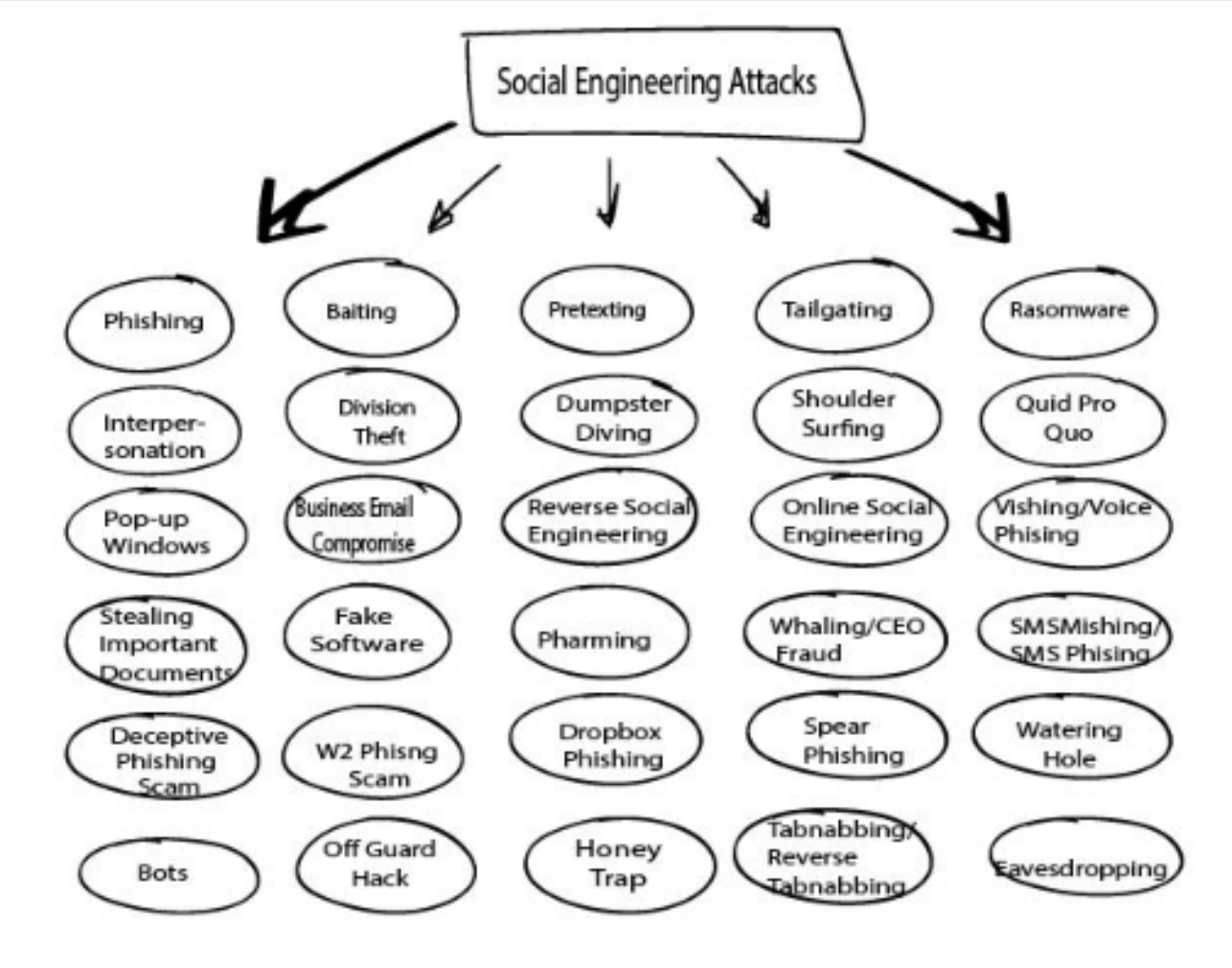


Figure 3: Classification of Vectors

Social Engineering Taxonomy: Human Factors

Mitnick (2011)	• Proposed the Social Engineering Attack Cycle (SEAC)
Nohberg & Kawalski (2008)	• Descriptive Model, depicts “Deceptive" crimes in SE.
Mouton et al. (2014)	• Introduced the “Ontological Model" for SE attacks
Harley (1998)	• One of the first Taxonomies in the SE Space
Laribee (2006)	• “Trust Model" and an “Attack Model."

Human Persuasion Strategies

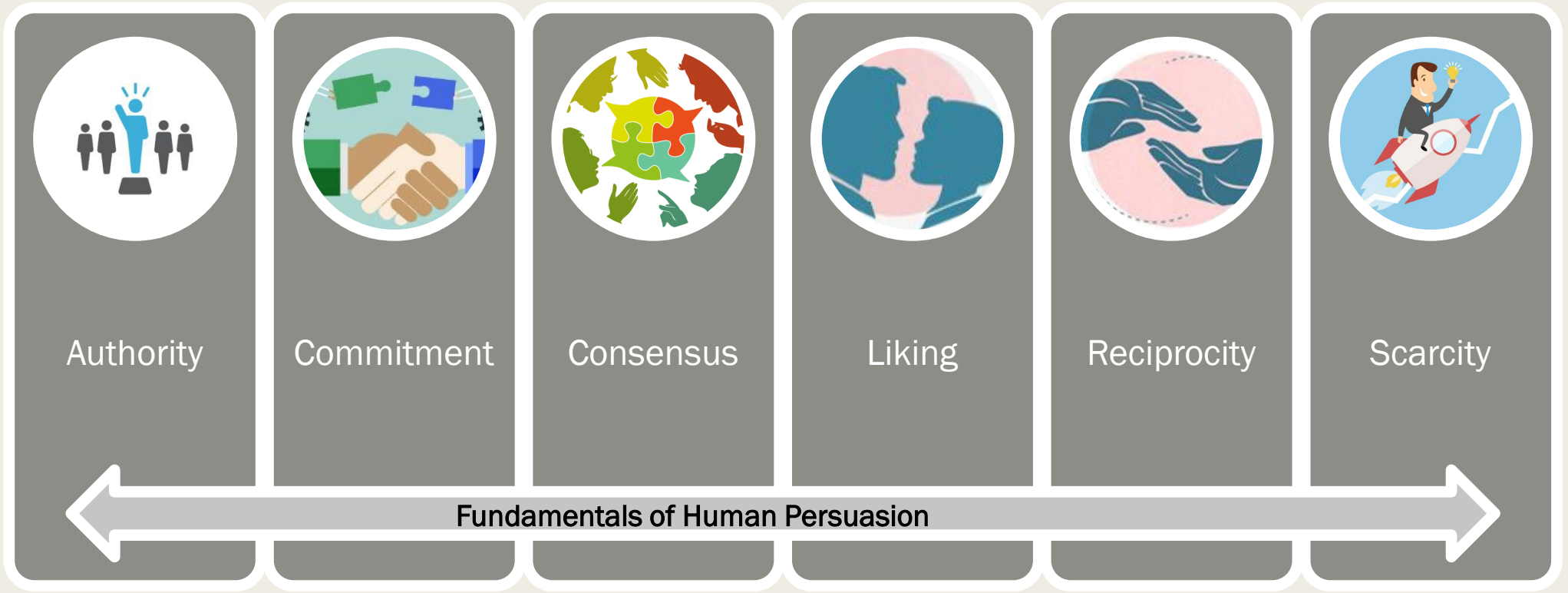


Figure 4: Six Fundamental Persuasion Principles for Human Behavior. Adapted from Cialdini (2001).

Human Five Factor Model of Personality

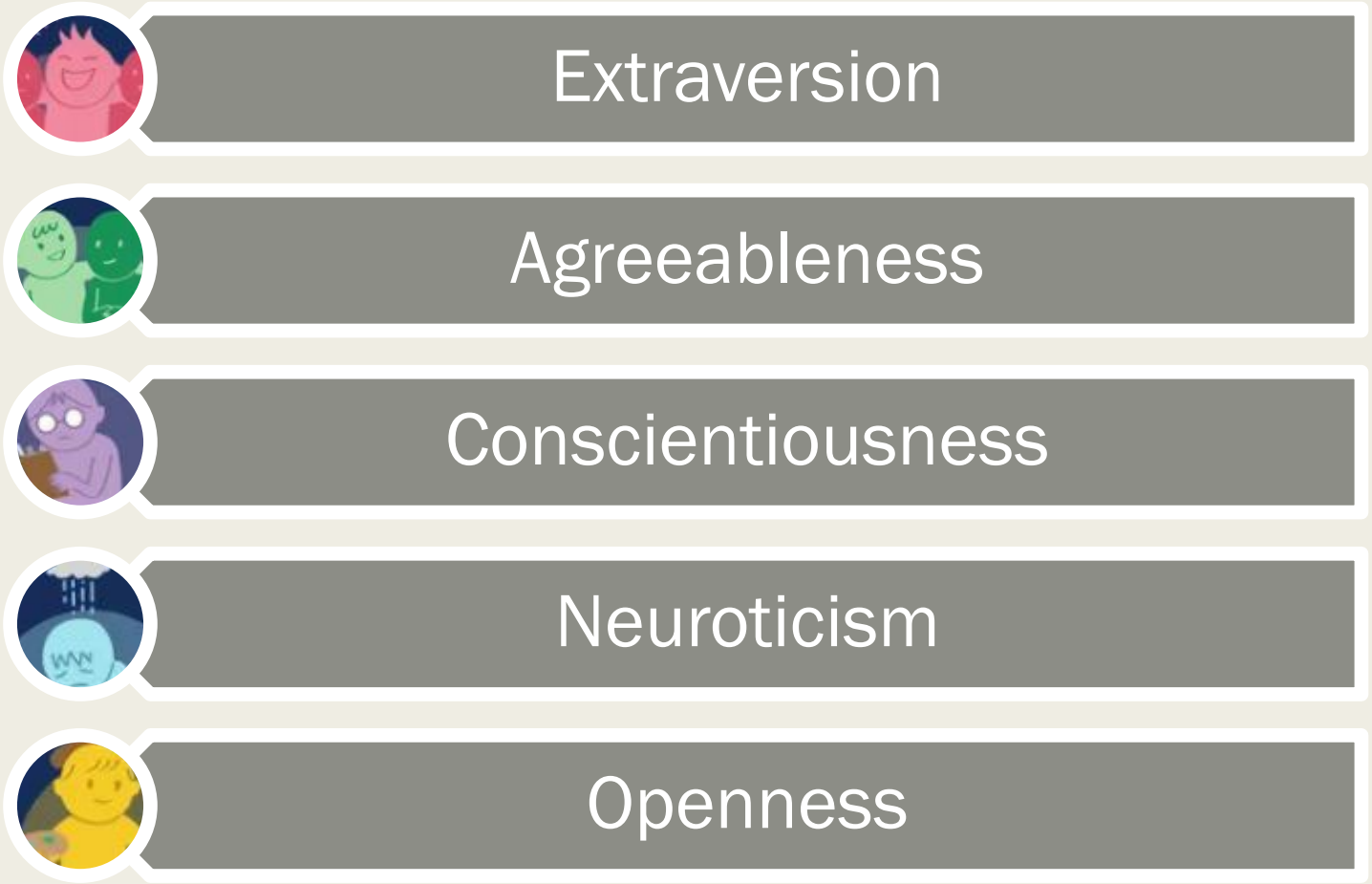


Figure 5: Five Factor Model of Personality. Adapted from McCrae an Oliver (1992).

Introspective Countermeasure Approach (UICA)

Table 1: Introspective Countermeasure Approach (UICA)

SE Attack Vectors	Personality Categories					Persuation Principles					
	Extraverstion	Agreeableness	Counscientiousness	Neurotocism	Openness	Authority	Commitment	Consensus	Liking	Reciprocity	Scarcity
Computer-based											
Phishing		X			X	X			X		
Pop-Up Windows				X	X						X
SMSMishing/ SMS Phishing		X		X	X	X			X		X
Ransomeware		X		X	X	X					X
Deceptive Phising/Scam		X	X	X	X	X			X		X
W2 Phishing scam		X	X			X	X		X		
Dropbox Phishing		X	X			X			X		
Spear Phishing		X	X	X	X	X	X		X		

SE Attack Vectors	Personality Categories					Persuation Principles					
	Extraverstion	Agreeableness	Counscientiousness	Neurotocism	Openness	Authority	Commitment	Consensus	Liking	Reciprocity	Scarcity
Human-based											
Baiting		X			X					X	X
Pretexting		X			X	X			X		
Interpesonation	X	X		X	X	X			X		X
Dumpster Diving				X							X
Tailgating	X	X		X	X	X		X	X		
Shoulder Surfing	X	X							X		X
Eavesdropping	X	X			X						X
Division Theft	X	X		X	X			X	X	X	X
Reverse Social Engineering (RSE)	X	X		X	X	X			X	X	X
Off-Guard Hack	X	X		X	X	X			X	X	X
Honey Trap	X	X		X	X				X		X
Stealing Important Documents		X									X

Introspective Countermeasure Approach (UICA)

SE Attack Vectors	Personality Categories					Persuation Principles					
	Extraverstion	Agreeableness	Counscientiousness	Neurotocism	Openness	Authority	Commitment	Consensus	Liking	Reciprocity	Scarcity
Hybrid-based											
Reverse Social Engineering (RSE)	X	X		X	X	X			X	X	X
Watering hole		X		X	X						X
Online Social ENgineering	X	X		X	X				X		

Defense Recommendations

Social Engineering Map:

- Leverage UICA to assess “Individual Strength”
  - *Assess Personality Types*
  - *Assess Strength by each individual as a dimension of Personality and Persuasion*
- Assess Systemic Strength
  - *Define Data & Information Threats*
  - *Classify multiple security mechanism*
- Map the system as presented in the Figure
- Testing, recommended to validate information presented
- Develop implementation plan to address vulnerabilities by system and individuals.

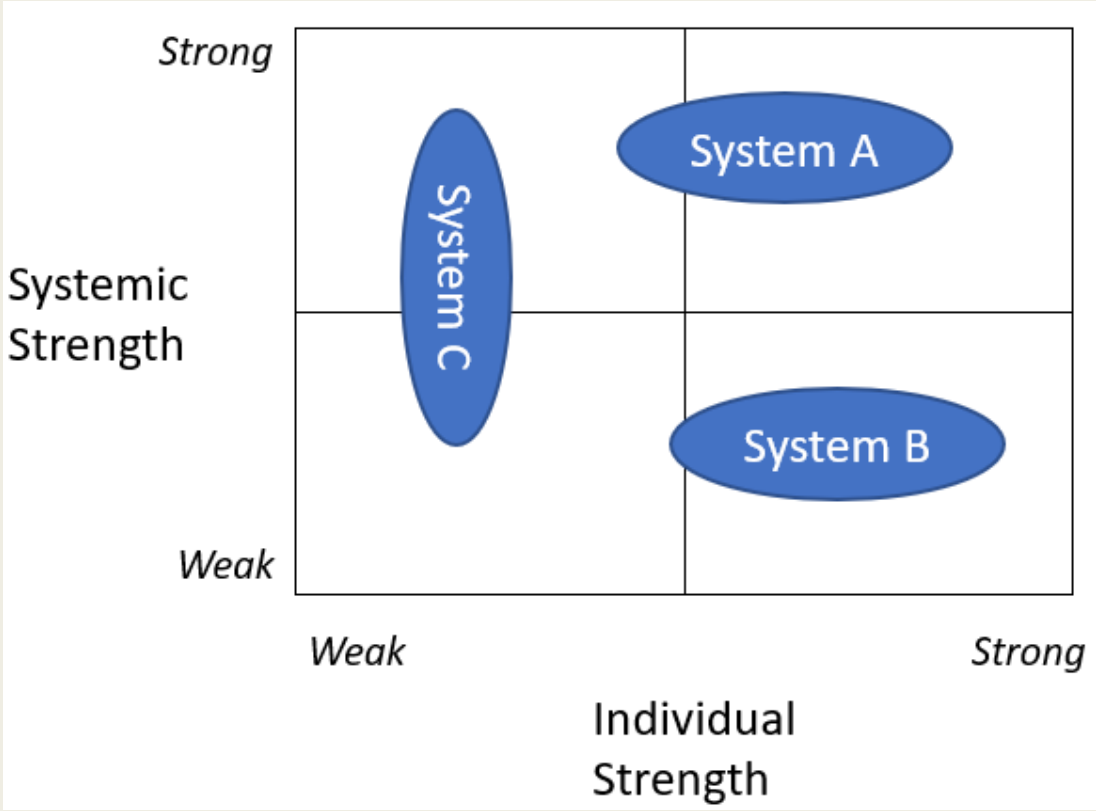
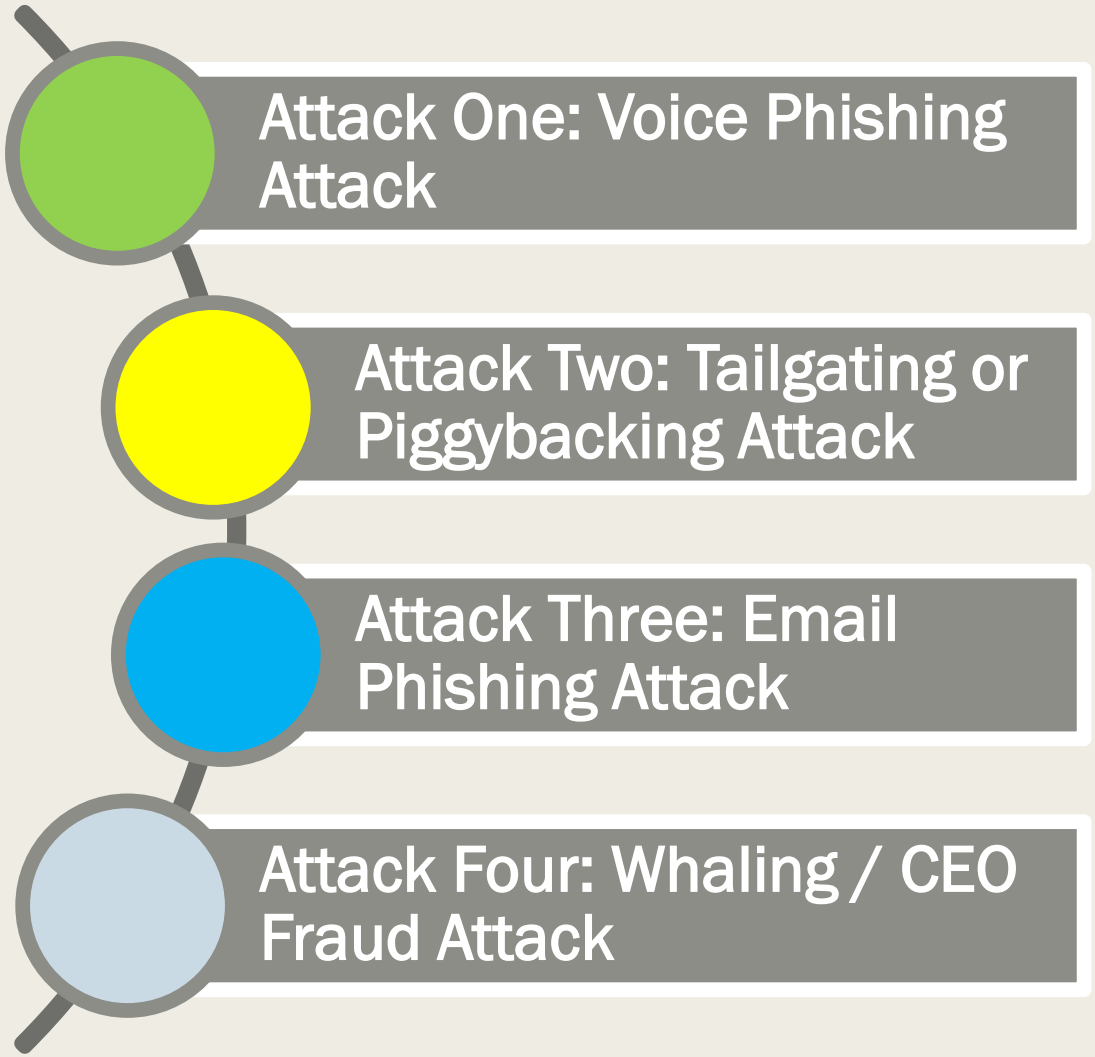


Figure 6: Social Engineering Map

Defense Recommendations



Conclusion & Future Research

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