Exploring Human and environmental factors that make organisations resilient to social engineering attacks

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WHY research on social engineering?

Most common modus operandi of cybercriminals

Social engineering

= Convincing people to give unauthorized persons access to sensitive data through manipulation.

Consequences e.g. data leakage, resulting in reputational or financial damage.

Focusgroup: Small and medium sized enterprises (sme's)

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Often focus on technical measures

This research: measures aimed at increasing the resilience of people

Research question:
‘Which human and environmental factors play a role in cyber safe behaviour when a social engineering attack takes place?’

Cyber safe behaviour = not giving sensitive data or access to this data to unauthorized persons when manipulated.

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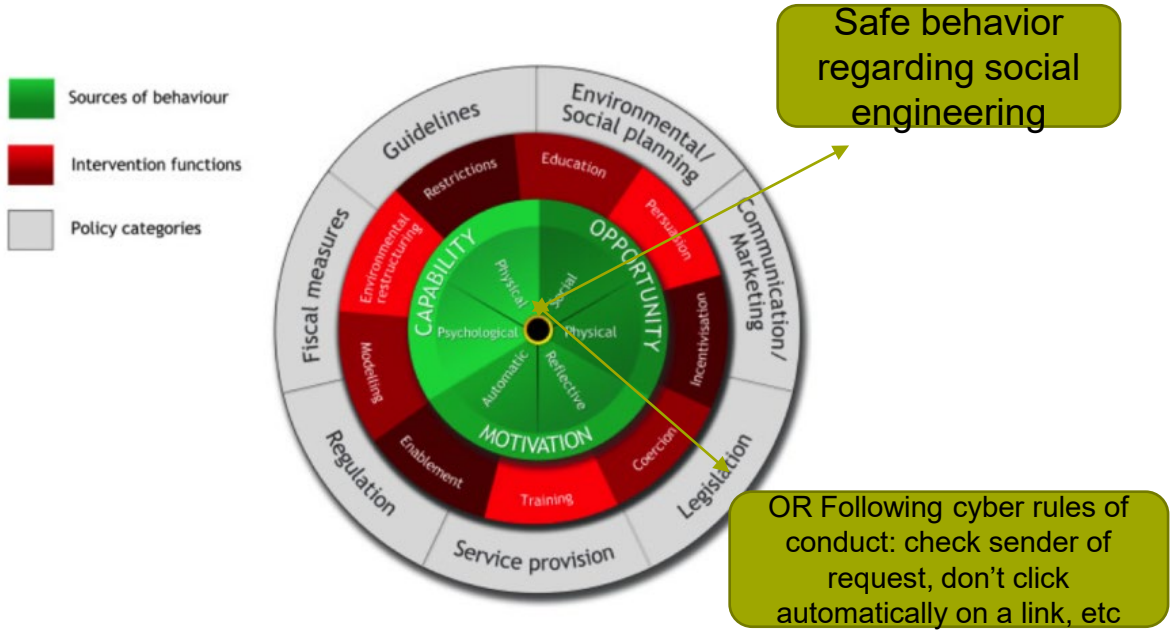
Human and environmental factors of behaviour in relation to social engineering

Capability Opportunity Motivation-Behaviour (COM-B) model for behaviour change (Michie, 2011)

Crime Prevention Through Environmental Design (Crowe, 2014)



COM-B model:
The BCW maps out which type of intervention function is likely to initiate behaviour change in each associated COM-B component, and following this, which policy categories should be addressed. By using this framework you are more likely to produce effective, theory-driven interventions, grounded in evidence-based principles.

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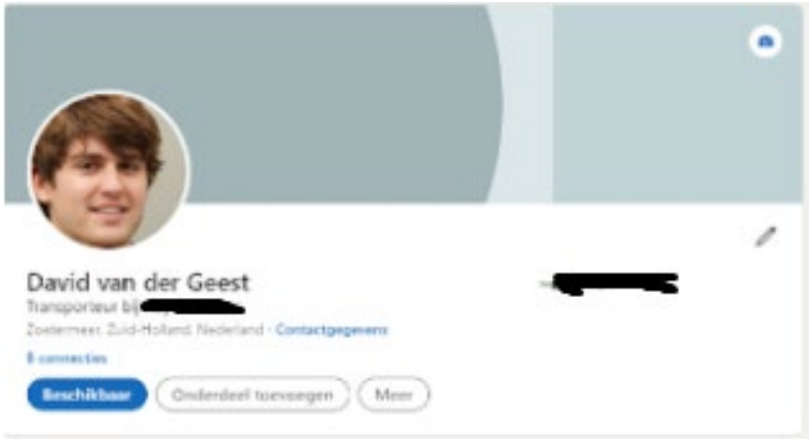
HOW: Method 1
Social engineering attacks

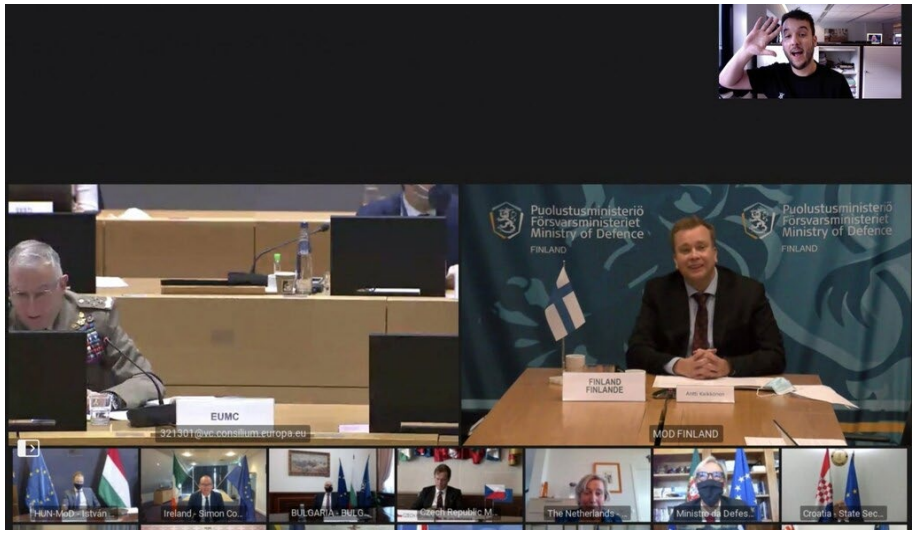
Types of social engineering

By telephone

Physical

Digital





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Social engineering attacks

Structured checklist:

Social engineeringcycle
Type of attack
Target
Provoked behaviour
Aimed data
Manipulation techniques (Cialdini, 2007) e.g. authority, social norm, scarcity

HOW: Methods

Qualitative explorative research

1. Social engineering attacks (digital, physical, by telephone)
   Analysis reports (observations)

2. Interview contact person social engineering organisations (11)
   7 <250 employees
   Grounded theory analysis of interview transcripts

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WHAT: Results

P = Physical attack
T = Attack by telephone
D = Digital attack

Organisations	Attack NOT successful	Attack successful
A		D, P
B		D, P
C	D, P	
D	T, D	P
E	T	D, P
F	T	P
G	D	T, P
H	T, P	D
I	D	
J	T, D	P
K		D

Table 1. Organisations and type of attacks that (not) succeeded

- Physical attacks are more successful (7 of 9)
- Nearly all attacks by telephone failed (5 of 6)
- Failed digital attacks (5 of 10)
- Small sized enterprises (<50 employees) Social control

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Results

"People know it and find it important, but do they behave like it..?"

- **Capability**: present differs per department.
- **Motivation:** present but no relation
- **Opportunity**:

Environmental context & resources

+ budget and involvement of other departments

- clear security policy and IT staff

Social influence

+ **Conversation protocol** how to interact with outsiders:

All failed T (5)

6 succesfull P no protocols

"Employees pick it up faster than management."

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WHAT: Results

- **Characteristics of leaders**: limited security knowledge, lack of role models
- Sensible information by Open source intelligence **(OSINT):** issues reported (7) but no relation
- All **awareness/security measures** like awareness training, red team assignments

- **Attacks direct influence** safe behaviour: Incident reports more often (3) and banners in emails

Exemplary role is very important to us because we are all young'.

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Conclusion and discussion

Social control important factor in countering social engineering attacks. All small sized enterprises **(<50 employees**).
Creating a **cyber-safe norm** (attacks are intervention), role model

Conversation protocol

Continue observational research on SMEs
Design of the work environmental context: email banners and report button

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let’s change
YOU. US. THE WORLD.

Example questions that appear in the interviews

- Which statements apply to your employees/colleagues when it comes to social engineering attacks (COMb):
  C: employees do have the knowledge, skills, are capable
  M: employees think its important, important to take measures, considers to pay attention
  O:
- How do people deal with mistakes? Can they openly talk about them
- What can you say about the physical layout of the work environment
- Which characteristics suit the managers within the organization?
  O monitoring the different processes
  O the main individual who is responsible
  O Are they an example for other employees
  O authentic leader.

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Welke uitspraken gelden bij uw medewerkers/ collega's wanneer het over social engineeringsaanvallen gaat. (motivation)

- [ ] Medewerkers vinden het belangrijk om maatregelen te treffen tegen malware, virussen, ransomware etc.
- [ ] Overweegt te letten op cyberveilig handelen
- [ ] Vindt cyberveiligheid belangrijk, ook al zijn er andere prioriteiten
- [ ] Handelt automatisch, niet zo alert
- [ ] Krijgt erkenning, wordt beloond bij cyberveilig gedrag

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De volgende voorzieningen zijn aanwezig. Kruis aan. En zo ja wil je een toelichting geven: (Opportunity)

- [ ] Is er in uw ogen voldoende budget voor IB?
- [ ] Is er voldoende mankracht voor cybersecurity. (Een verantwoordelijke?)
- [ ] Zijn er andere afdelingen betrokken bijv. communicatie
- [ ] Is er een beleid met duidelijke concrete stappen.
- [ ] Andere

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Welke uitspraken gelden bij uw medewerkers/ collega's wanneer het over social engineeringsaanvallen gaat. (Capability)

- [ ] Medewerkers hebben de benodigde kennis
- [ ] Medewerkers hebben de benodigde vaardigheden
- [ ] Medewerkers zijn in staat om adequaat te handelen
- [ ] Informatiebeveiliging staat regelmatig op de agenda