CyBOK

The Cyber Security Body Of Knowledge

Towards a Responsible Cyber Security Profession: Mapping CyBOK to Ethical Concerns

Ivan Flechais & George Chalhoub
ivan.flechais@cs.ox.ac.uk
george.chalhoub@cs.ox.ac.uk

contact@cybok.org
www.cybok.org

Ethics of Cyber Security

- Ethical issues in Cyber Security are widespread: e.g. privacy, disclosure, transparency, autonomy, justice, etc.

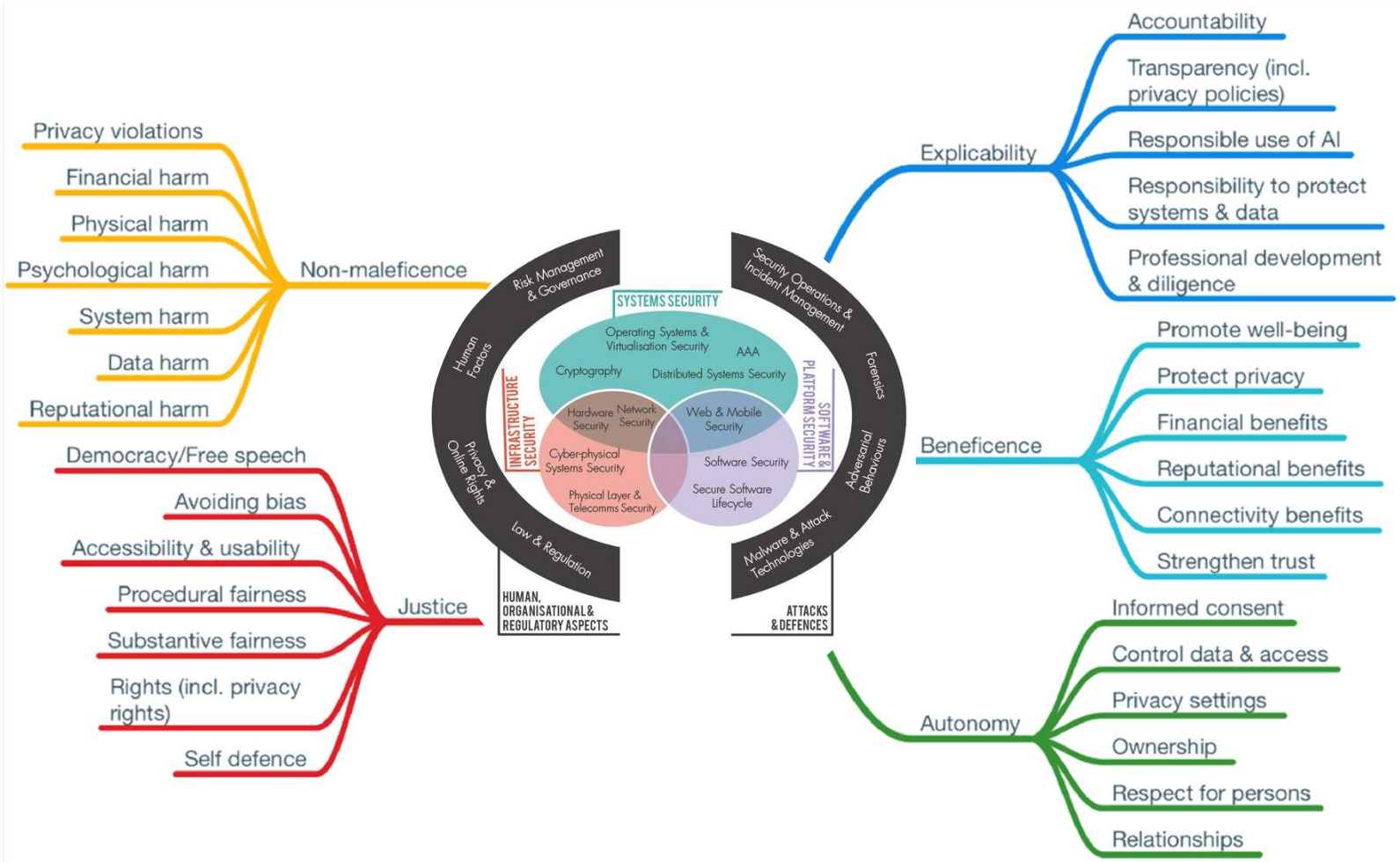
- Unlike in academic research, Cyber Security Professionals have no ethical review boards to help

- Existing guidance is generally quite high level:
  - UK Cyber Security Council's code of ethics
  - ISSA Code of Ethics
  - ACM Code of Ethics and Professional Conduct
  - …

Research

- Objective: Map Cyber Security Ethical challenges against CyBOK

- Method:
    1. Literature review of cyber security ethics
    2. Interviews with experts and professionals to identify and map ethical issues


Privacy violations
Financial harm
Physical harm
Psychological harm
System harm
Data harm
Reputational harm
Non-maleficence
Democracy/Free speech
Avoiding bias
Accessibility & usability
Procedural fairness
Substantive fairness
Rights (incl. privacy rights)
Self defence
Justice
Accountability
Transparency (incl. privacy policies)
Responsible use of AI
Responsibility to protect systems & data
Professional development & diligence
Explicability
Promote well-being
Protect privacy
Financial benefits
Reputational benefits
Connectivity benefits
Strengthen trust
Beneficence
Informed consent
Control data & access
Privacy settings
Ownership
Respect for persons
Relationships
Autonomy
Risk Management & Governance
Human Factors
Privacy & Online Rights
Law & Regulation
HUMAN, ORGANISATIONAL & REGULATORY ASPECTS
Security Operations & Incident Management
Forensics
Adversarial Behaviours
Malware & Attack Technologies
ATTACKS & DEFENCES
SYSTEMS SECURITY
Operating Systems & Virtualisation Security
AAA
Cryptography
Distributed Systems Security
INFRASTRUCTURE SECURITY
Hardware Security
Network Security
Cyber-physical Systems Security
Physical Layer & Telecomms Security
PLATFORM SECURITY
SOFTWARE &
Web & Mobile Security
Software Security
Secure Software Lifecycle

Example dilemmas

- Ethical implications of associating with irresponsible third parties (either clients or service providers)
- Possible harm arising from how security information is interpreted by customers
- Navigating conflicts between company and customer interests

Findings

Systems Security

Contracting Third Party Security Services

Cyber security Resource Allocation

Infrastructure Security

Balancing Infrastructure Security with Privacy

Ensuring Accountability and Responsibility in AI

Software & Platform Security

Disclosure and Patching of Vulnerabilities

Prioritising Vulnerability Patching Practices

Disclosing Security Incidents Without Losing Customer Trust

Human, Organisational, Regulatory Aspects

Always Maintaining Confidentiality

Conflicts between Business & Security Practices

Disclosing Security Risks Without Making Users Feel Insecure

Attacks & Defences

Ethical Security Hacking and Cyber Intrusion

Defending Against Cyber Attacks

Implications

- Ethics should be embedded into cyber security
- Mapping of common dilemmas to different areas
- Training provided to identify and tackle dilemmas
- More research is needed™

Discussion

- Cyber security is concerned with ***desirable*** *decisions and actions to manage threats, vulnerabilities, and impacts*

- Desirable decisions involve judgement and can involve multiple perspectives/tradeoffs. Should some views hold more weight? On what basis/evidence?

- Cyber security has three dimensions: objective, subjective, affective – all are valid, but are they equal?

Discussion

- Decision-makers have power over others, and decisions happen in all aspects of cyber security profession. What are the structures of responsibility, and how are individuals held to account?
- How much should individuals rely on precedent (aka “best” practice) to resolve dilemmas?
- How can a cyber security professional be supported in tackling ethical issues?

Thank you!

- Any questions?