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# CyBOK

The Cyber Security Body Of Knowledge



## Mapping cyber-enabled roles to the CyBOK

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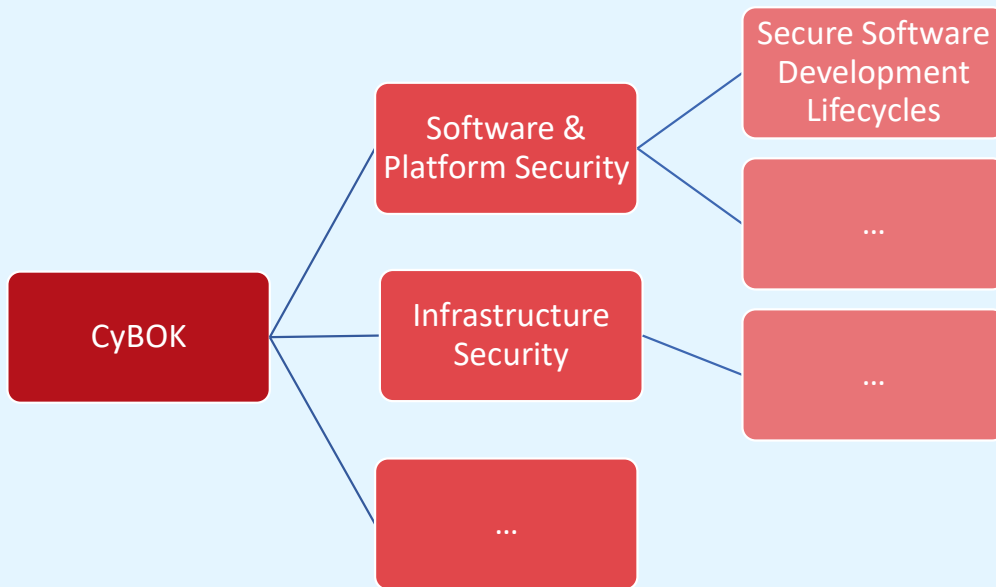
# Context

- Skills gaps and shortages stifle growth, economic output, and productivity.
  - Cyber Security skills gaps/shortages amplify the broader and ever-present problem of cyber-attacks.
- The issue has been highlighted in multiple government reports:
  - [Cyber security skills in the UK labour market 2022 - GOV.UK \(www.gov.uk\)](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/105211/cyber-security-skills-in-the-uk-labour-market-2022.pdf)
  - [Cyber security skills in the UK labour market 2021 - GOV.UK \(www.gov.uk\)](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/95211/cyber-security-skills-in-the-uk-labour-market-2021.pdf)
  - [Cyber security skills in the UK labour market 2020 - GOV.UK \(www.gov.uk\)](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/85211/cyber-security-skills-in-the-uk-labour-market-2020.pdf)

# Context

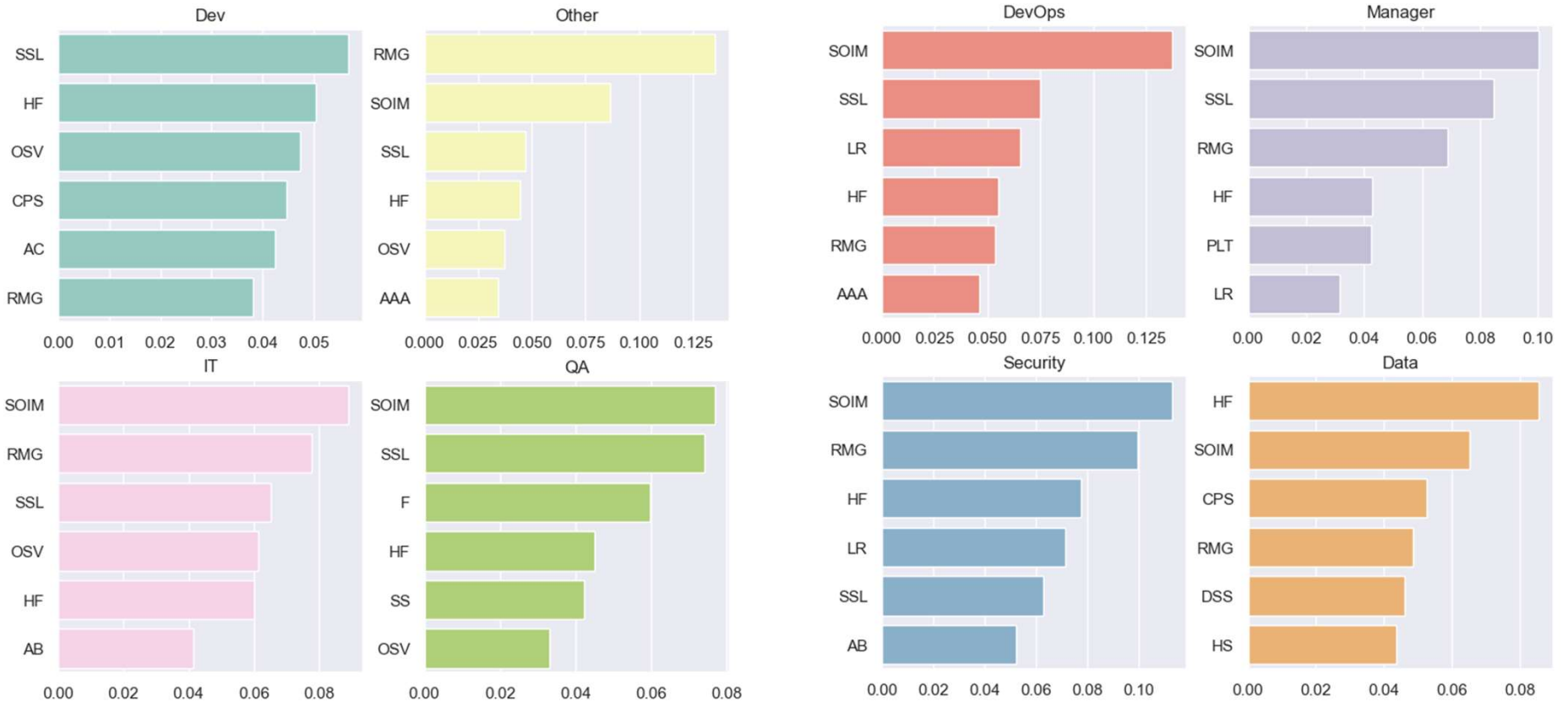
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  - [Cyber security skills in the UK labour market 2020 - GOV.UK \(www.gov.uk\)](https://www.gov.uk/government/reports/2020/cyber-security-skills-in-the-uk-labour-market-2020)
- **Cyber-enabled roles:** Roles that aren't formally recognised as cyber security roles, but nonetheless require cyber security skills.

# Context



- The CyBOK aims to systematise knowledge that is recognised as being related to Cyber Security.
- One of the key aims of the CyBOK is to support educators in designing cyber security curricula.
  - It is used as a tool to help certify degrees in the UK.
- It consists of knowledge areas divided across knowledge groups.

# Context

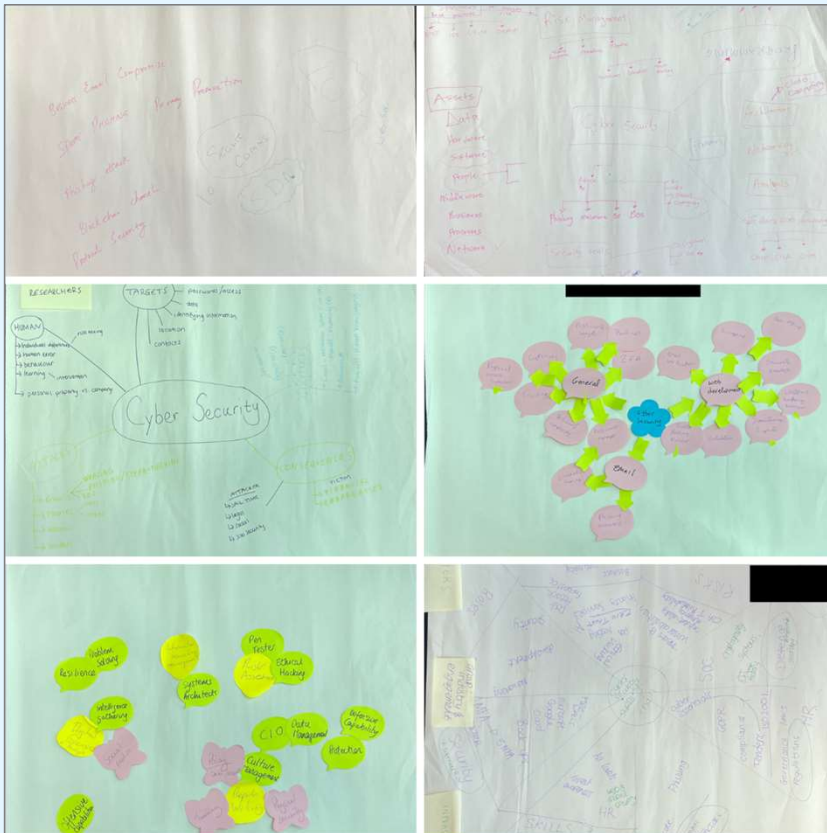


# Method

- We held a mapping workshop at the UCLan Engineering Innovation Centre. 19 cyber-enabled practitioners attended.
- At the workshop, participants first mapped their own understanding of cyber security, and then mapped their roles to the CyBOK areas.
- We then analysed (qualitative) these mappings and produced several resources based on them.



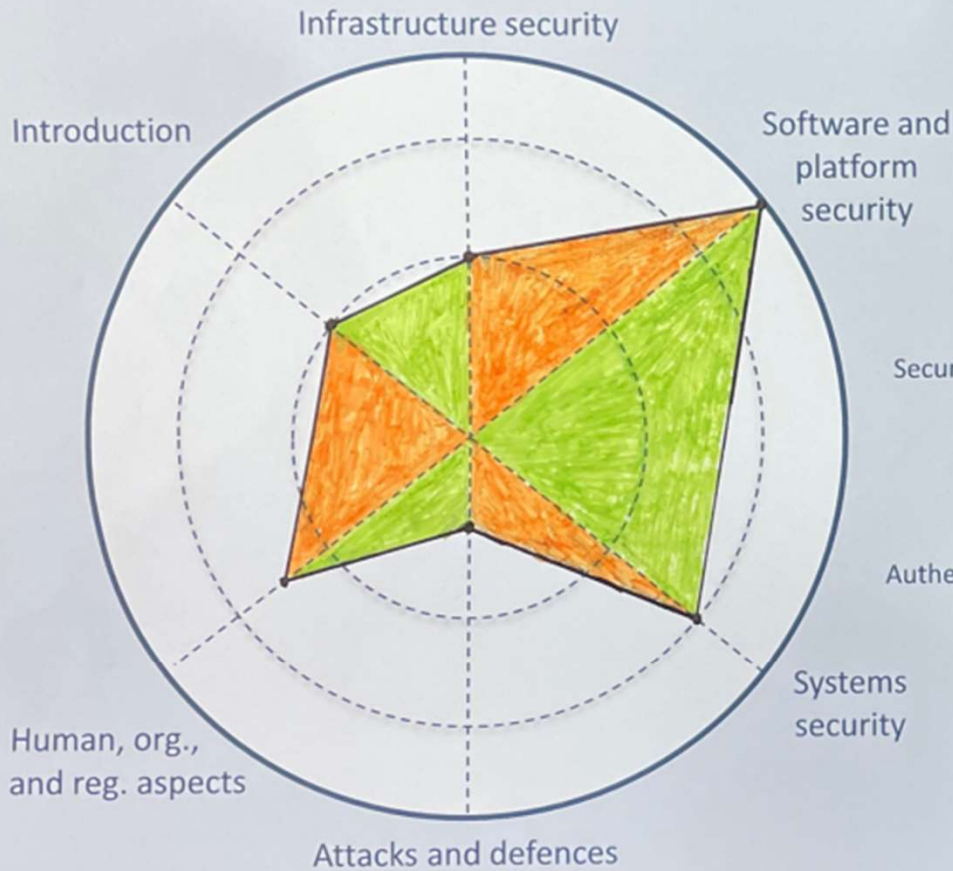
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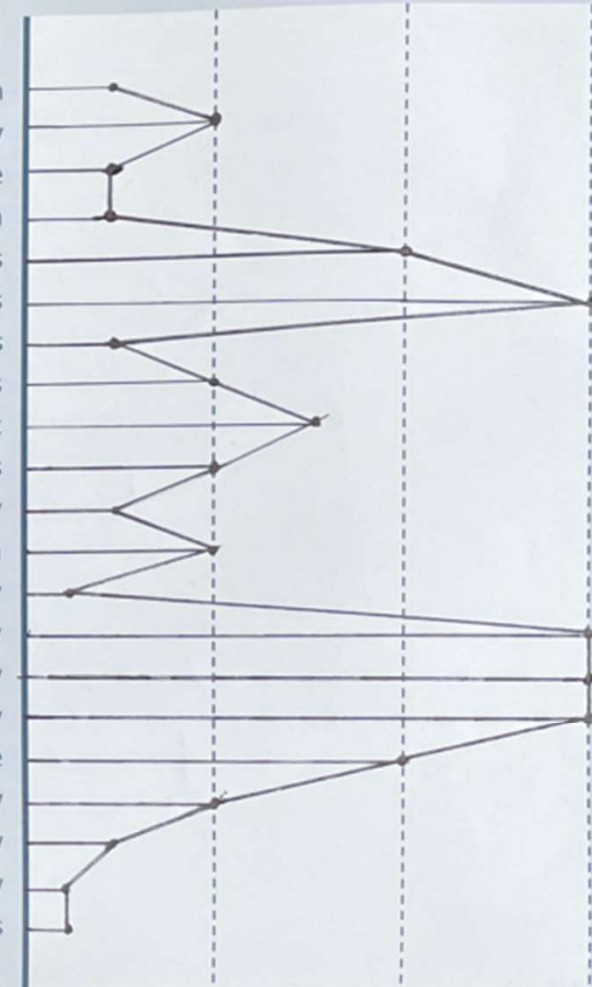
- Initial mappings demonstrate the differing depth and breadth of Cyber Security knowledge across the different groups.
- A group of 'Software Developers' highlighted items such as 'Security Headers' and 'Wordpress Hardening Techniques'.
- All but one of the initial mappings featured a 'Phishing' item.



# Mapping worksheet

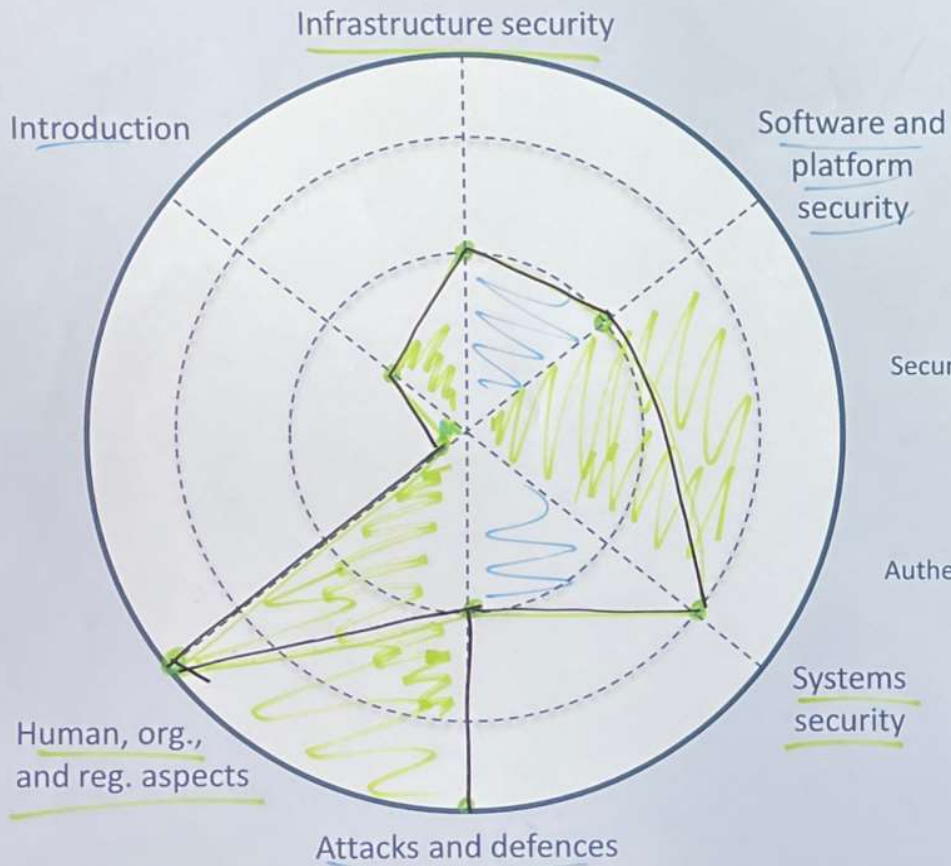


- CyBOK Introduction
- Formal methods for security
- Risk management & governance
- Law & regulation
- Human factors
- Privacy & online rights
- Malware & attack technologies
- Adversarial behaviours
- Security operations & incident management
- Forensics
- Cryptography
- Operating systems & virtualisation
- Distributed systems security
- Authentication, authorisation, accountability
- Software security
- Web & mobile security
- Secure software lifecycle
- Network security
- Hardware security
- Cyber-physical systems security
- Physical-layer & telecommunications



The Researchers (psychology)

# Mapping worksheet

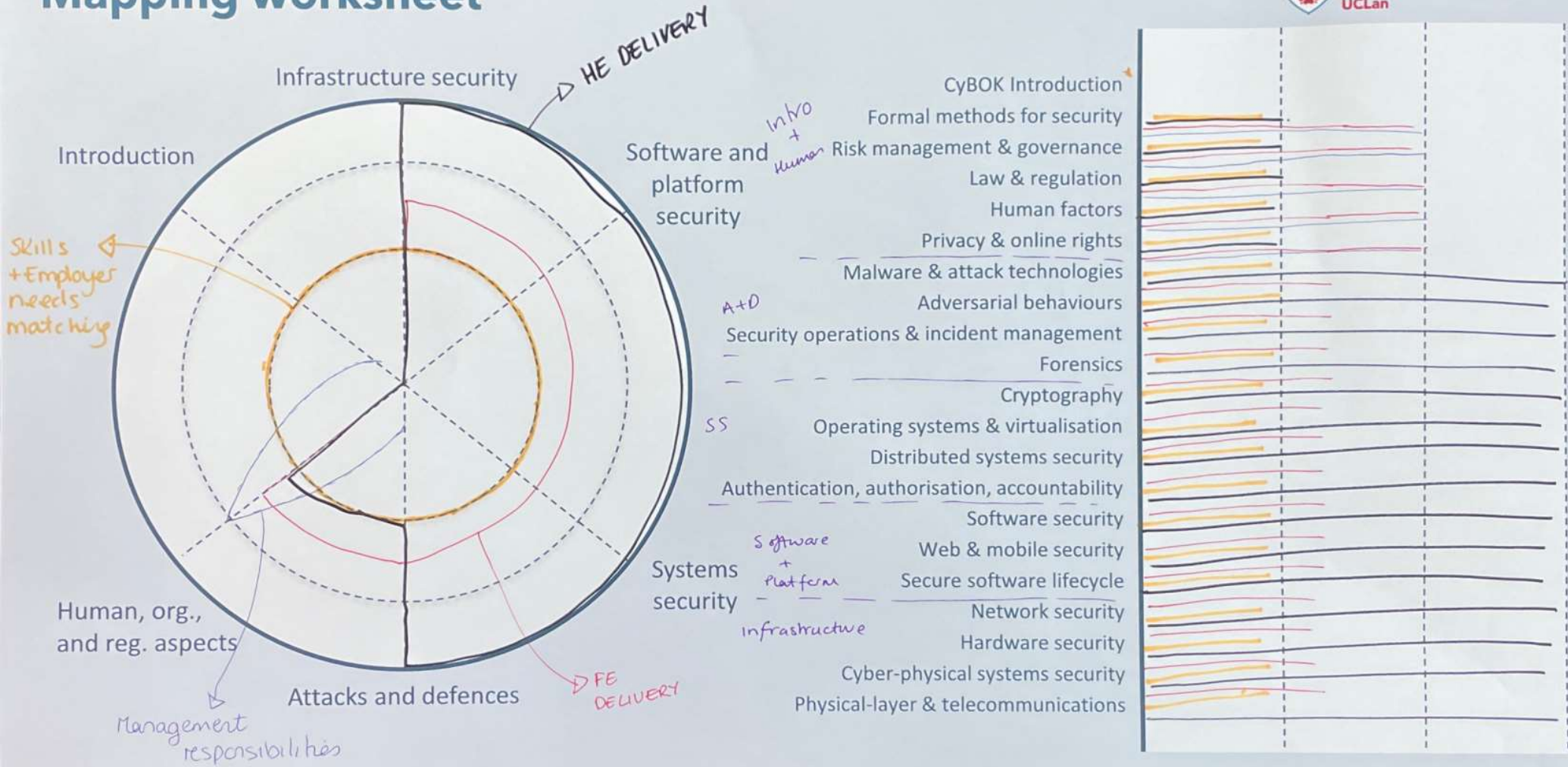


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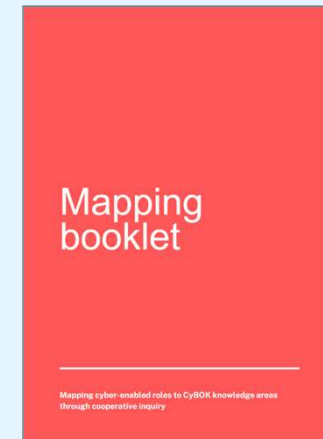
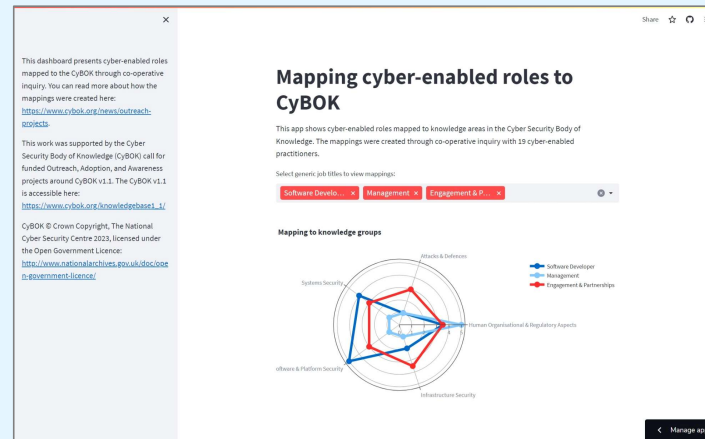
FE/HE/DEPT.MANAGER

# Mapping worksheet



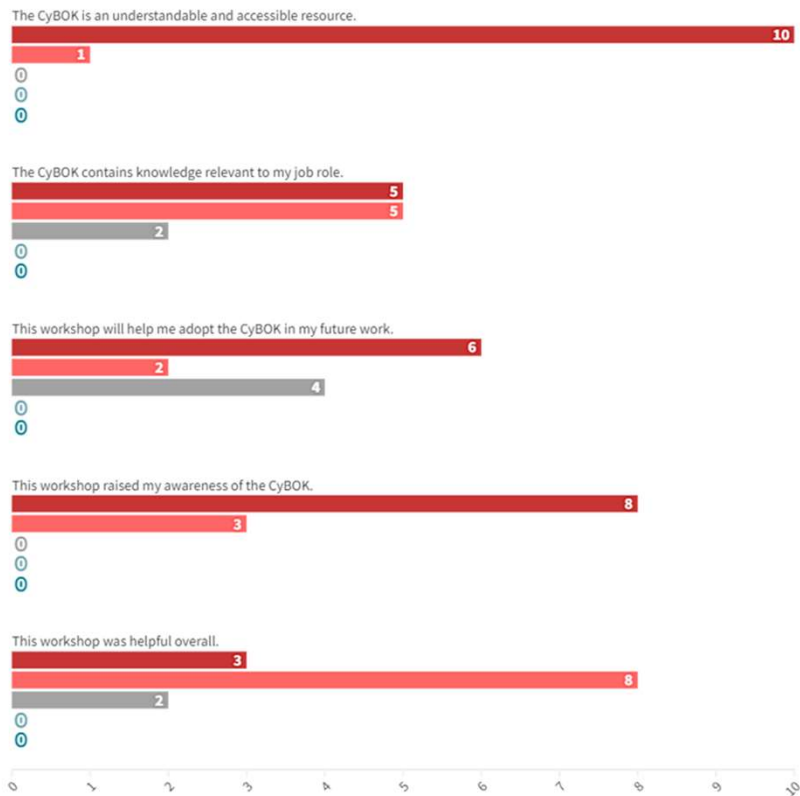
# Outputs

- We have created 2 resources based on the mappings to the CyBOK. The purpose of these is to share our findings with a wider audience:
  - A short mapping booklet (PDF).
  - An interactive mapping app.



# Outcomes

Strongly agree Agree Neither agree/disagree Disagree Strongly Disagree



- Most of the participating cyber-enabled practitioners provided feedback on the workshop and the CyBOK itself.
- Overall, they found the CyBOK to be relevant to their roles and both understandable and accessible.
- Similarly, they found the workshop to be helpful in that it raised their awareness of the CyBOK and will help them to adopt it in their future work.

# Next steps

- We recommend the workshop resources that we have developed and trailed are used to co-produce mappings with a greater quantity and variety of practitioners.
  - The mappings could support the creation of short courses and training for cyber-enabled (and core-cyber) practitioners.
  - A topic guide for cyber-enabled practitioners?
- We are working to develop mixed-methods approaches that combine the nomothetic benefits of job listings with the idiographic benefits of our mapping workshops, with a view to better understanding the cyber skills gap.

**Get the session plan and run your  
own mapping workshops:**

**[bit.ly/3xuVKBZ](https://bit.ly/3xuVKBZ)**

**CyBOK**

**contact@cybok.org**  
**www.cybok.org**