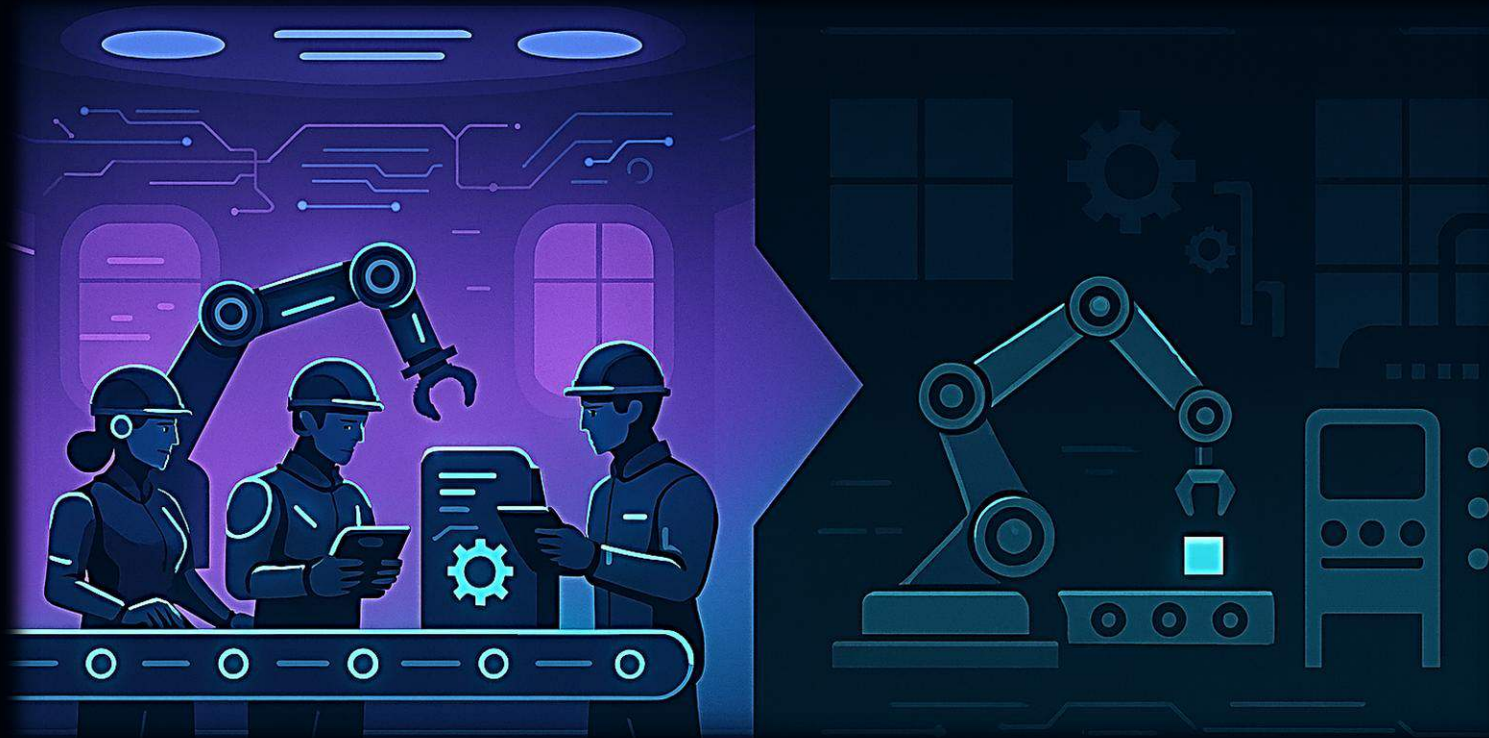
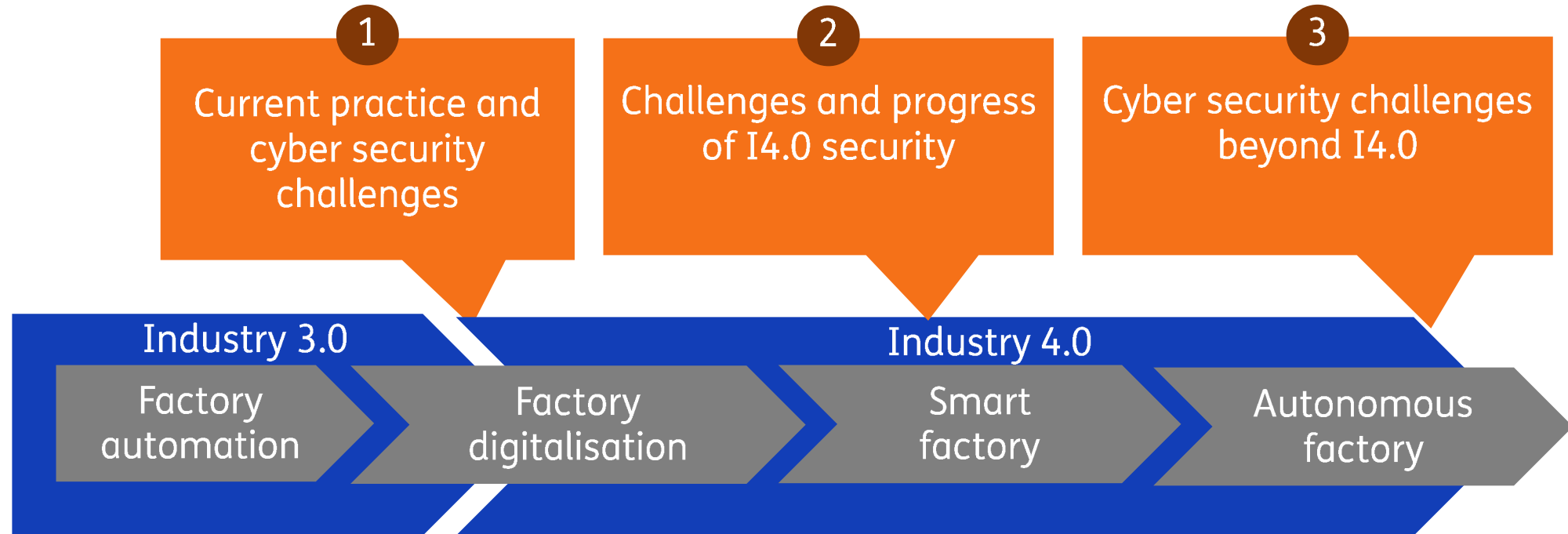


Resiliently shifting from Human-Operated to Lights-Out Factories

Mahira Ali
20 Nov. 2025



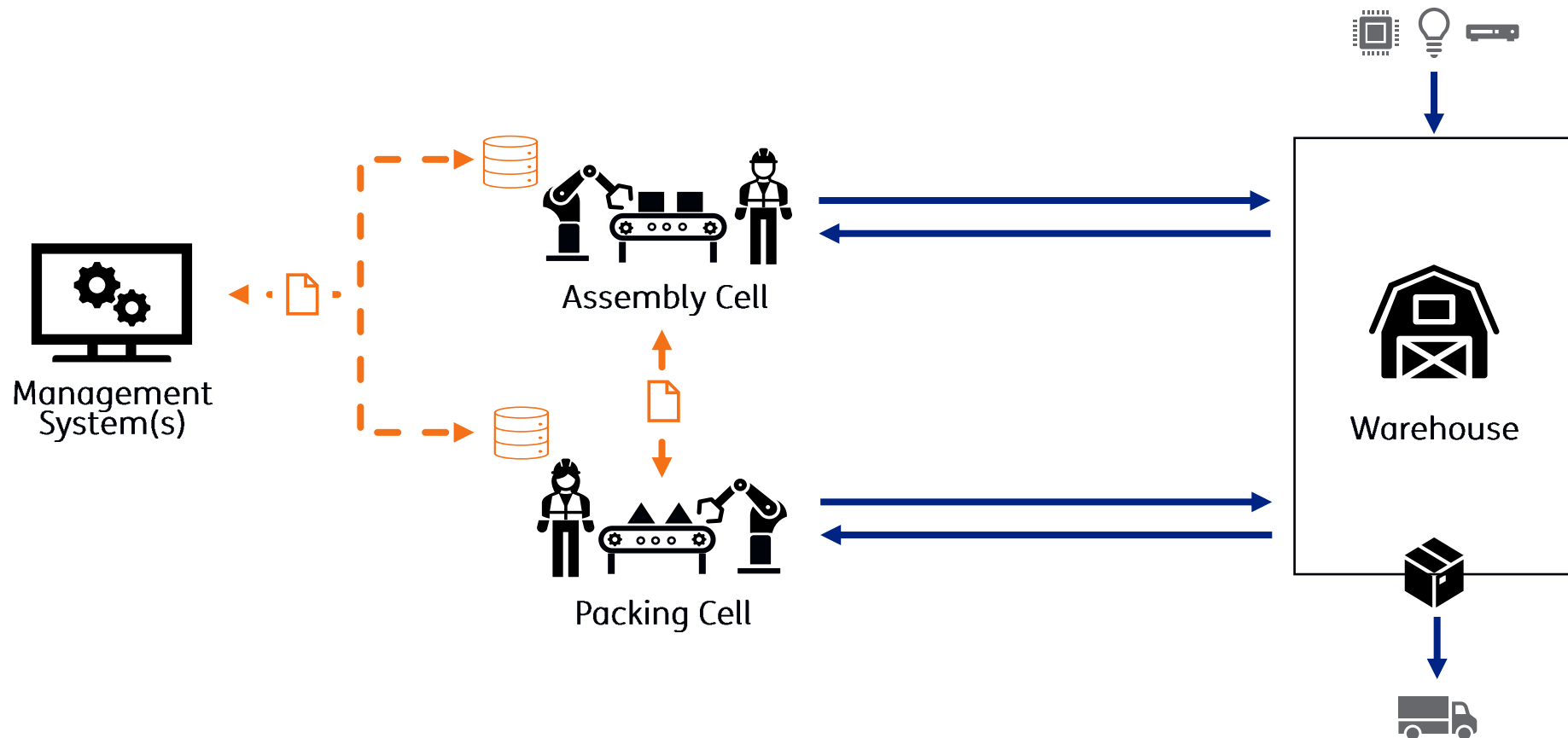
Agenda *



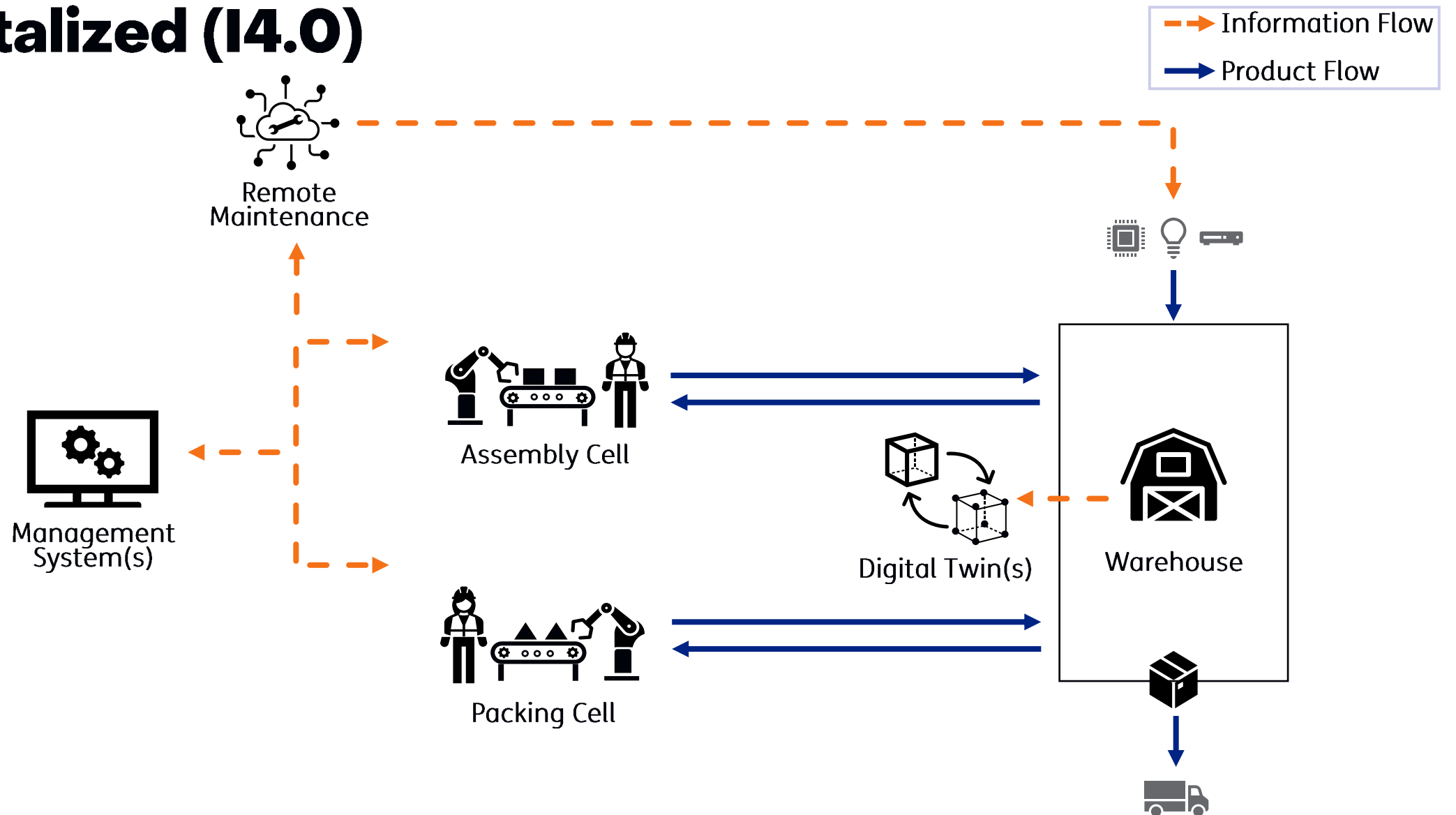
* This work is part of the Growth Fund Programme NXTGen Hightech Smart Industry

Current factory information processing

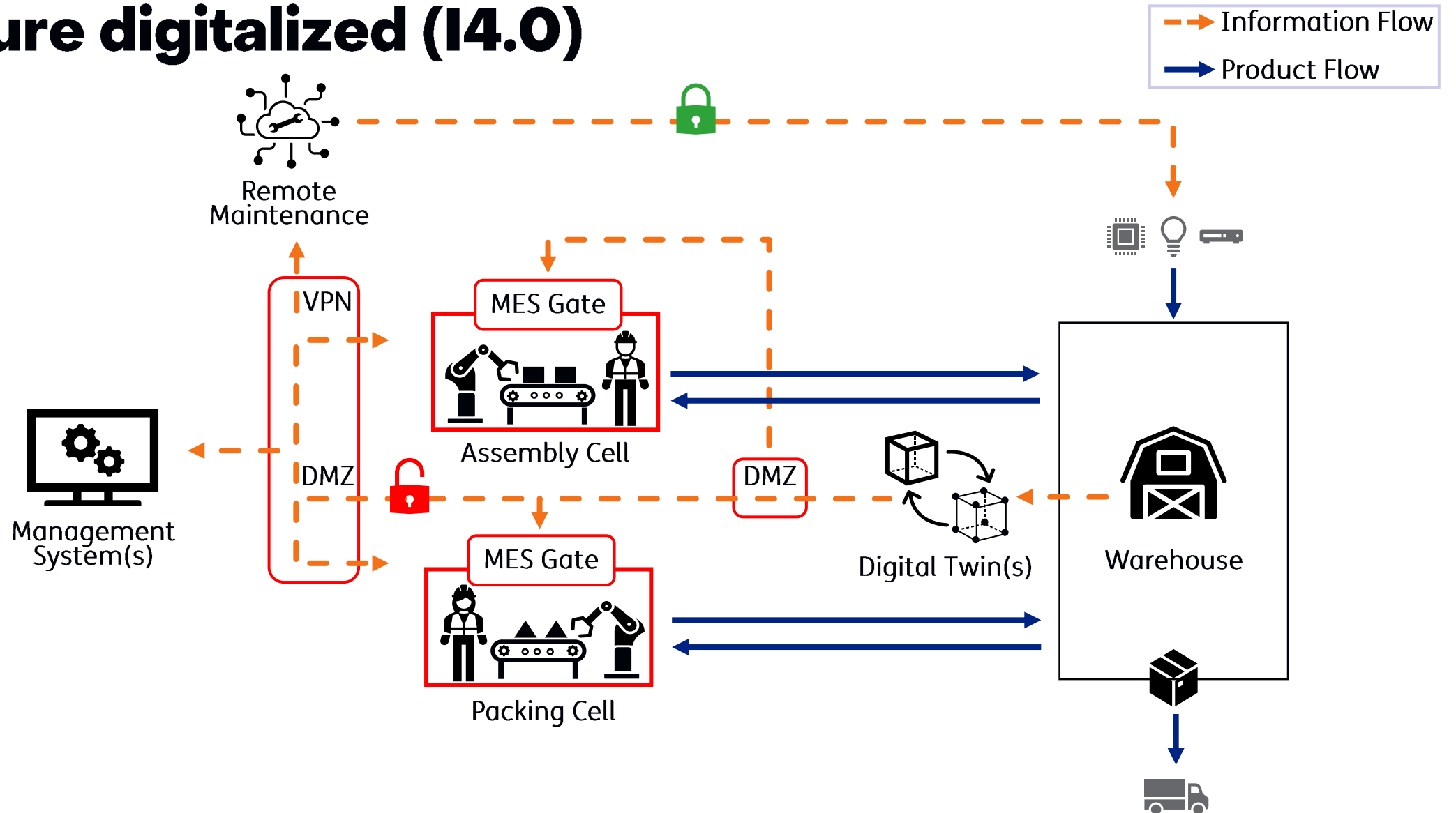
Case provided by Smart Industry partner



Digitalized (I4.0)



Secure digitalized (I4.0)



Use case: Smart Cyber Resilient Factory



The **old way** of 'digitalizing' the **shop floor**



Digitalization **maturity** stage: **low**



Desire: **I4.0-ready** digitalization

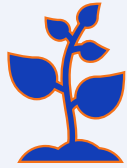


Relevant **threat**: 'unauthorized control messaging'



How to **mitigate** the **threat**, appropriately for the **current** and **desired stage** ?

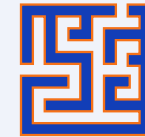
Survey: Current practices and challenges



Cyber security of enterprise IT and IoT in manufacturing sector are maturing



No straightforward translation from cyber security to security of ICS (Industrial Control System)



IT/OT security practices are characterised by labyrinth of standards, frameworks and legislation

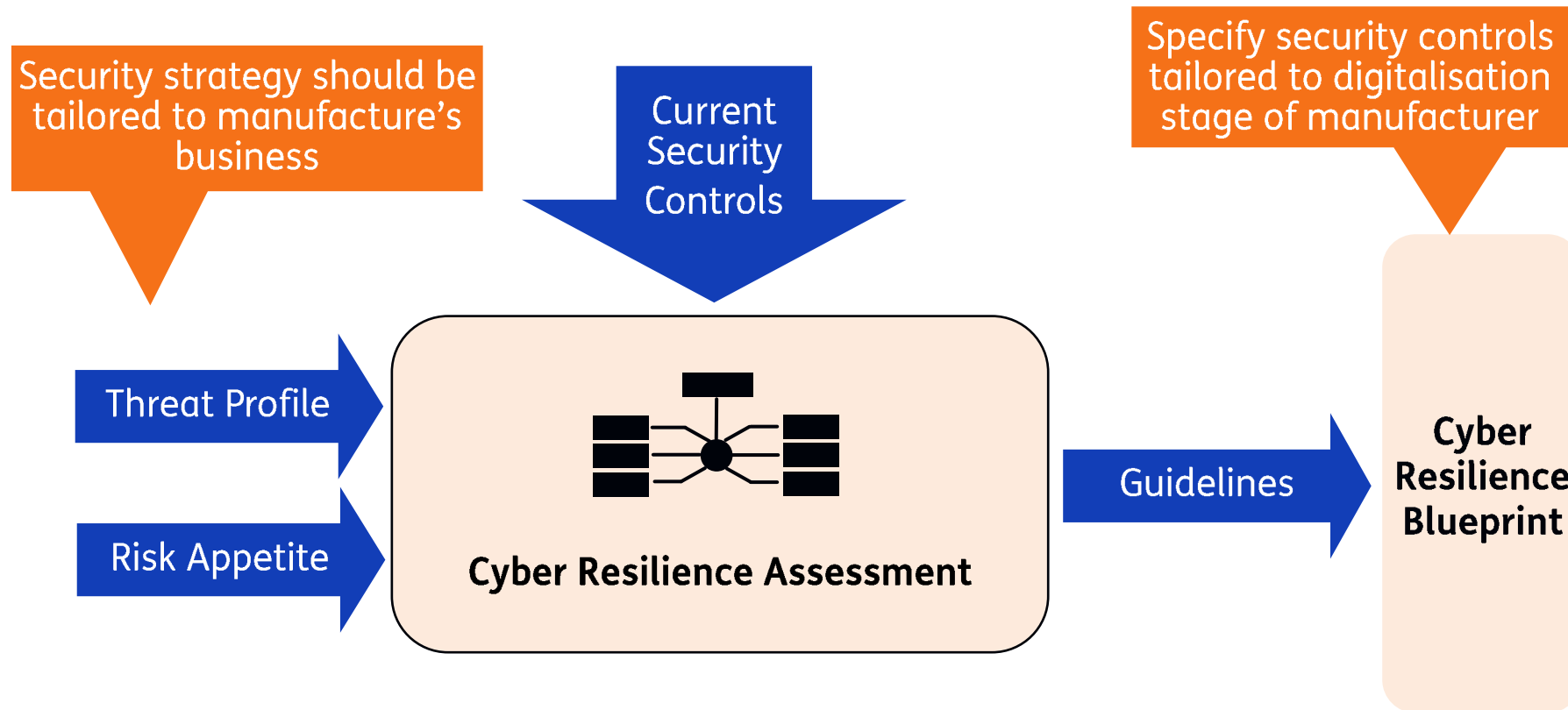
Challenge #1:

ICS security should be tailored to the manufacturer's business and digitalisation stage

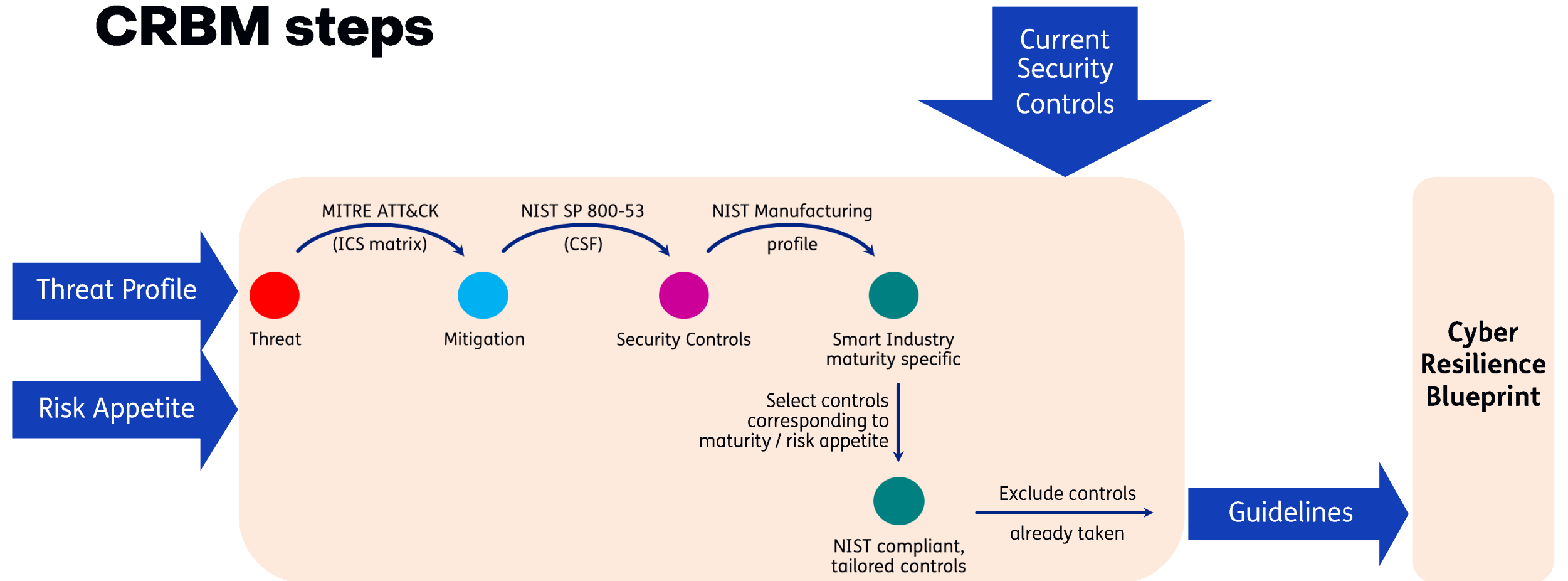
Challenge #2:

In absence of harmonized standards and legislation, overview is needed to develop the required ICS security solution

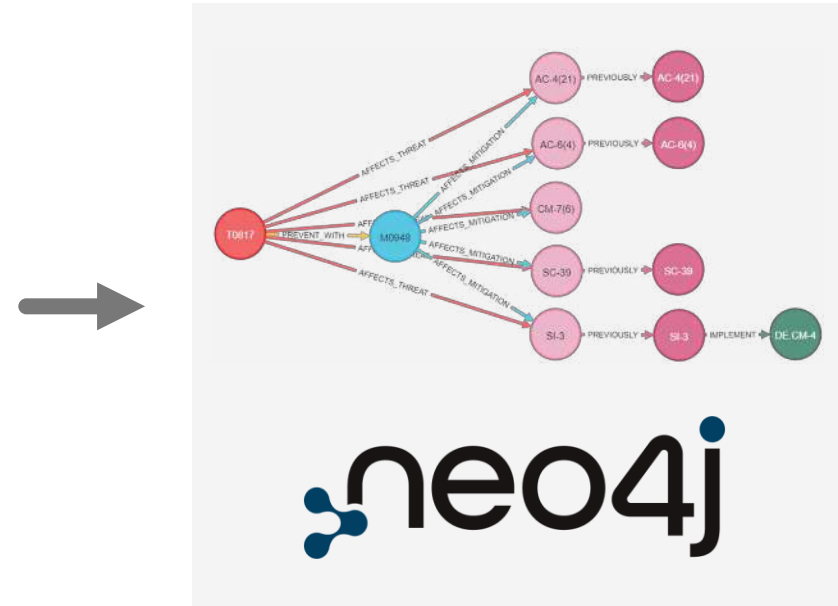
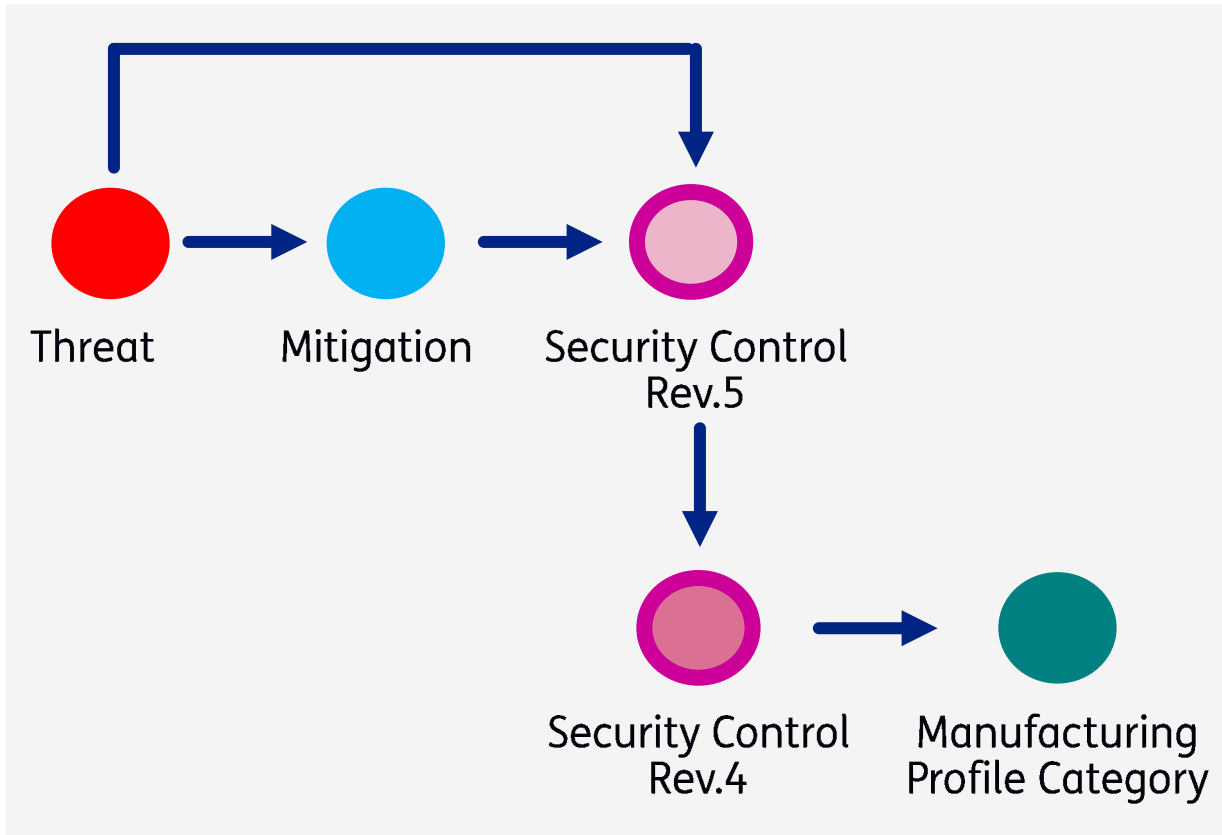
Cyber Resilience Blueprint for Manufacturing (CRBM)



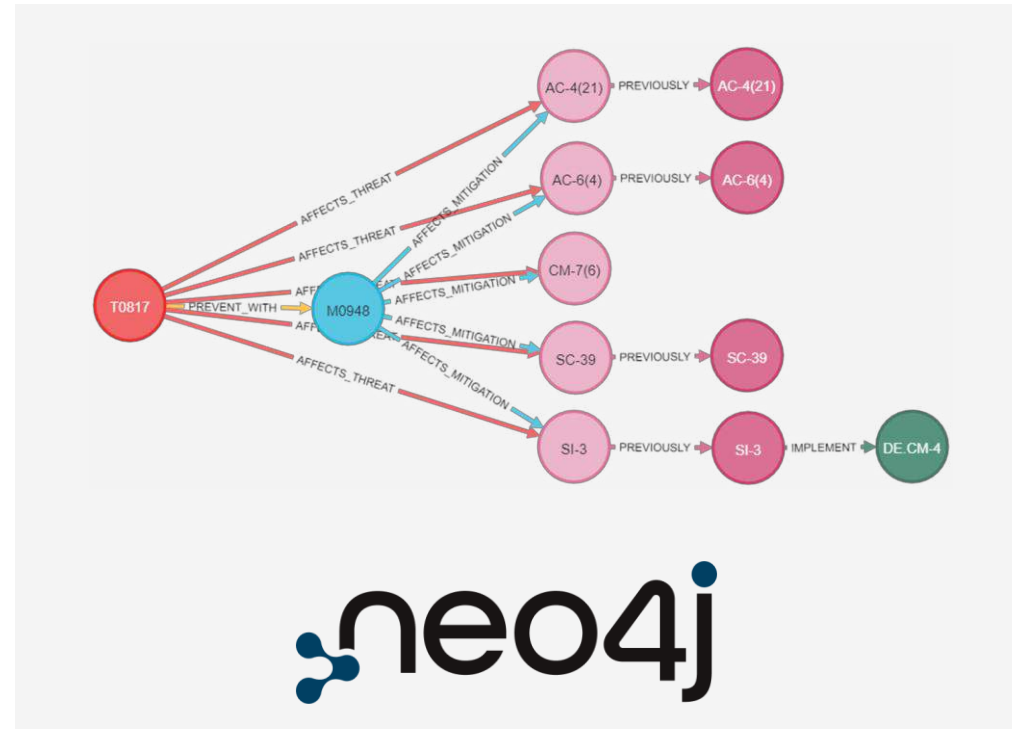
CRBM steps



CRBM Knowledge Graph

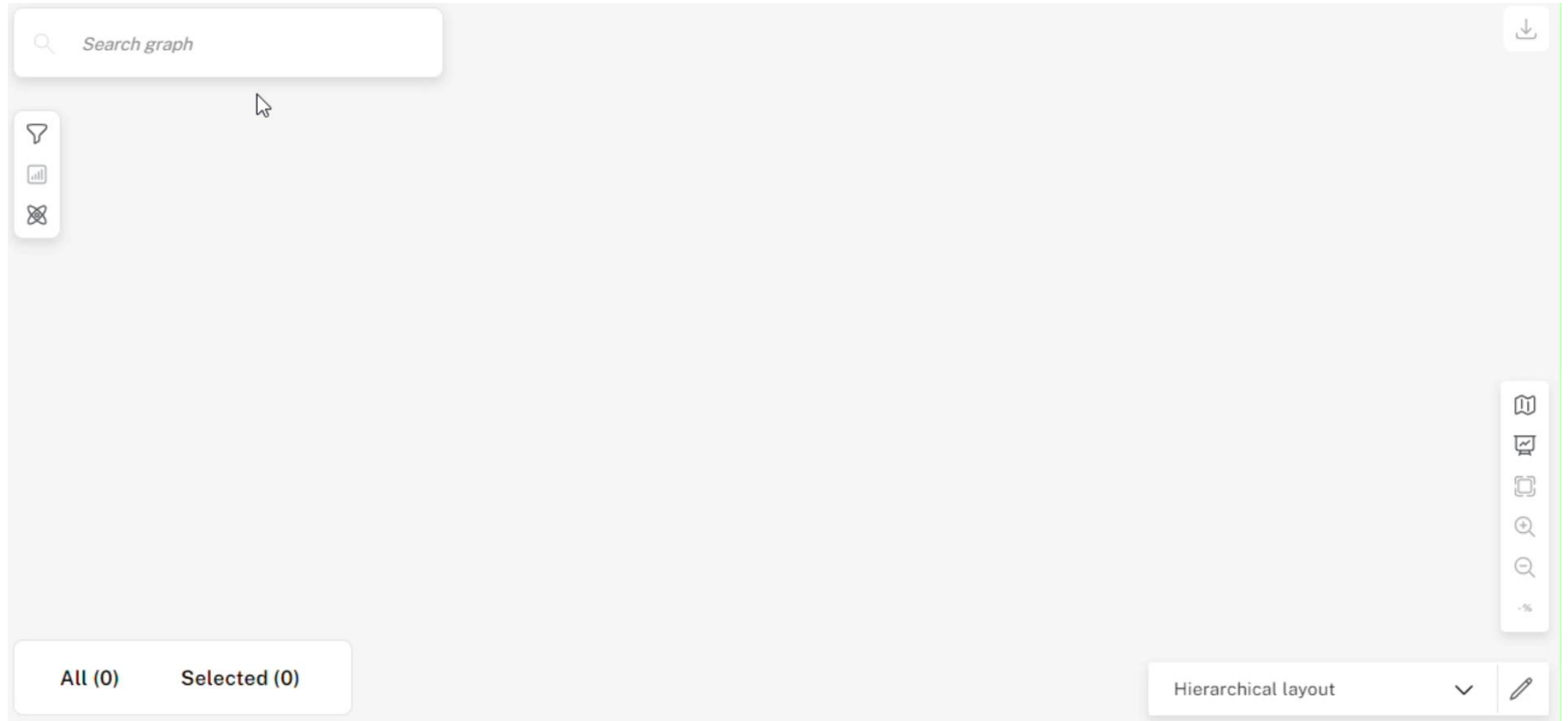


CRBM Use-Case Demonstration

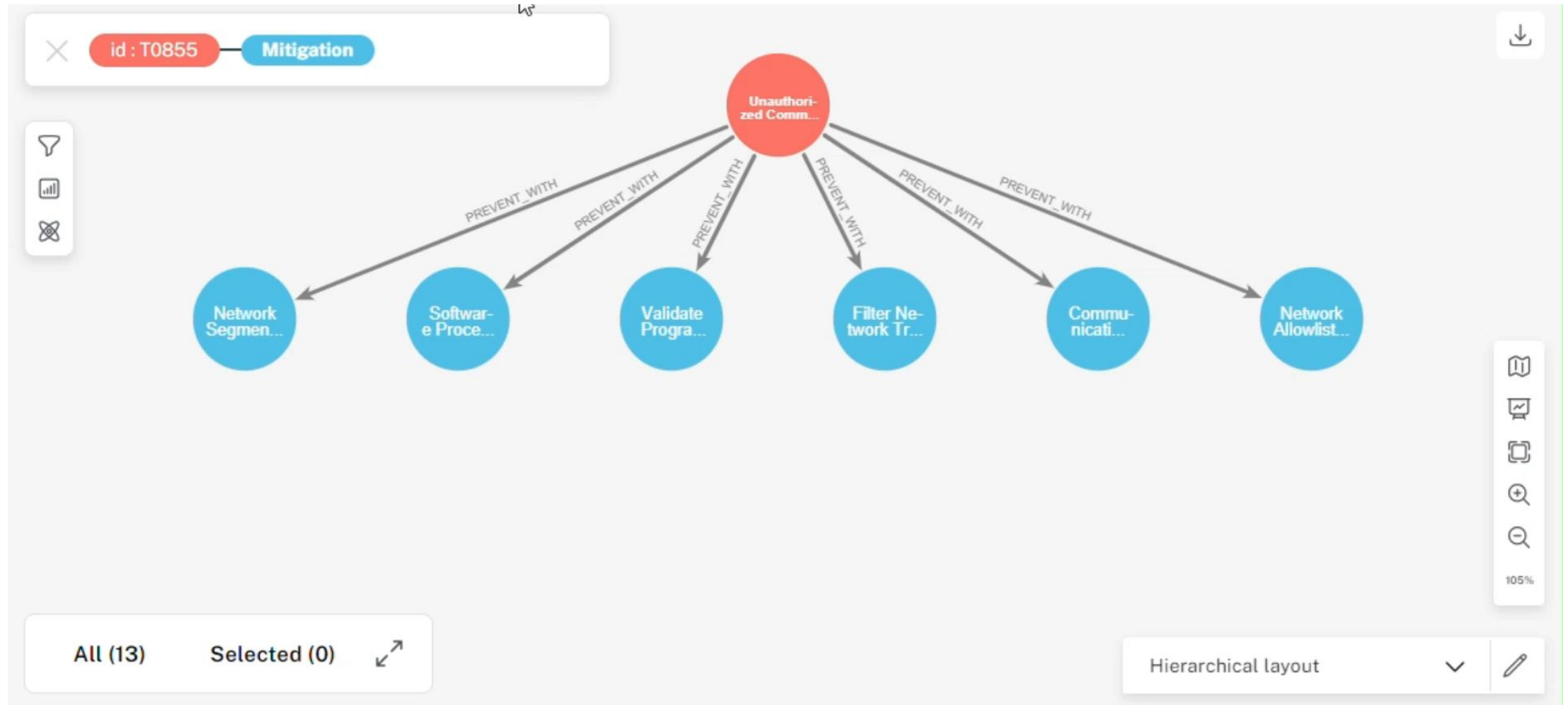


*Note: demo shows how to get from threats to standards compliant, maturity appropriate security controls
Ultimate objective: automating this cyber reasoning to achieve autonomous cyber resilient factory*

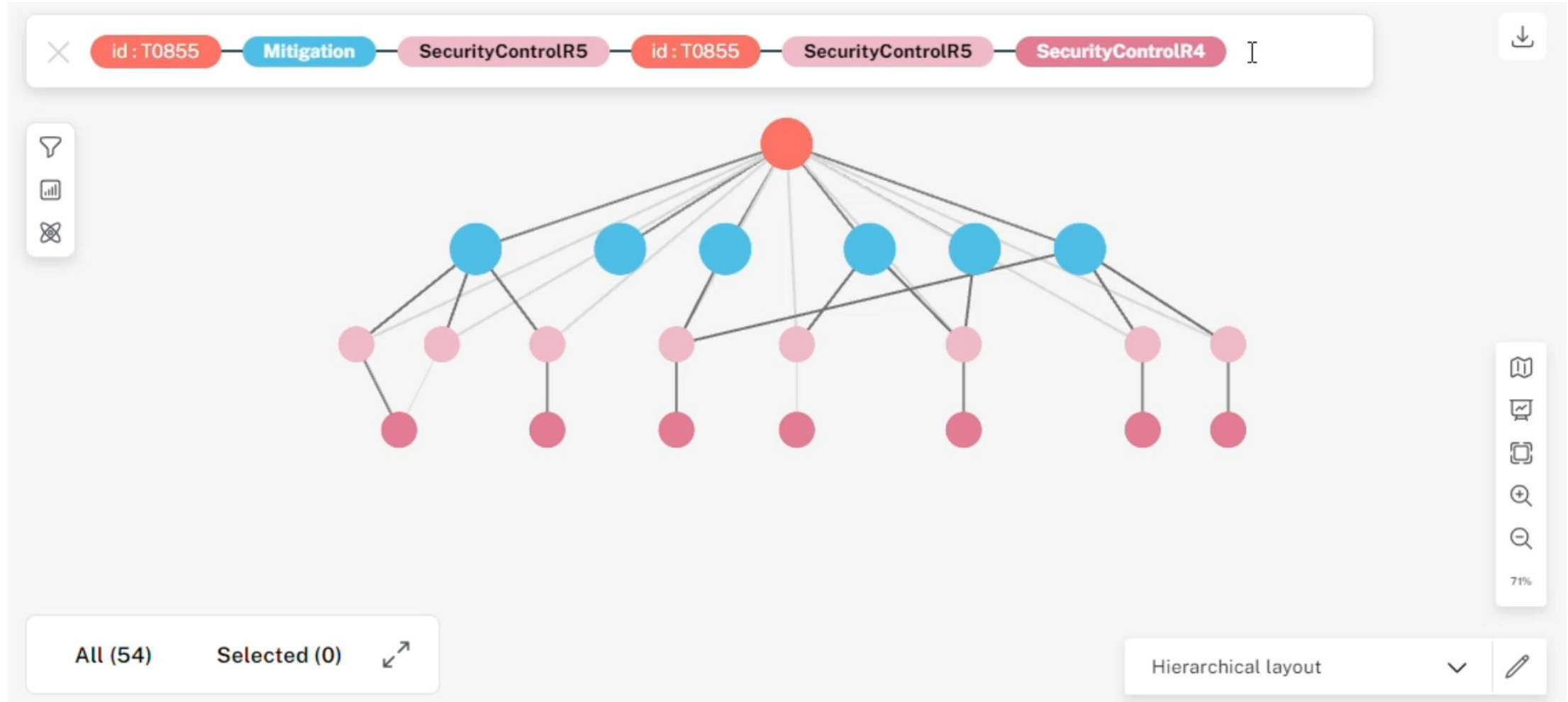
T0855: Unauthorized Control Messaging - Mitigations



T0855: Unauthorized Control Messaging – Security Controls

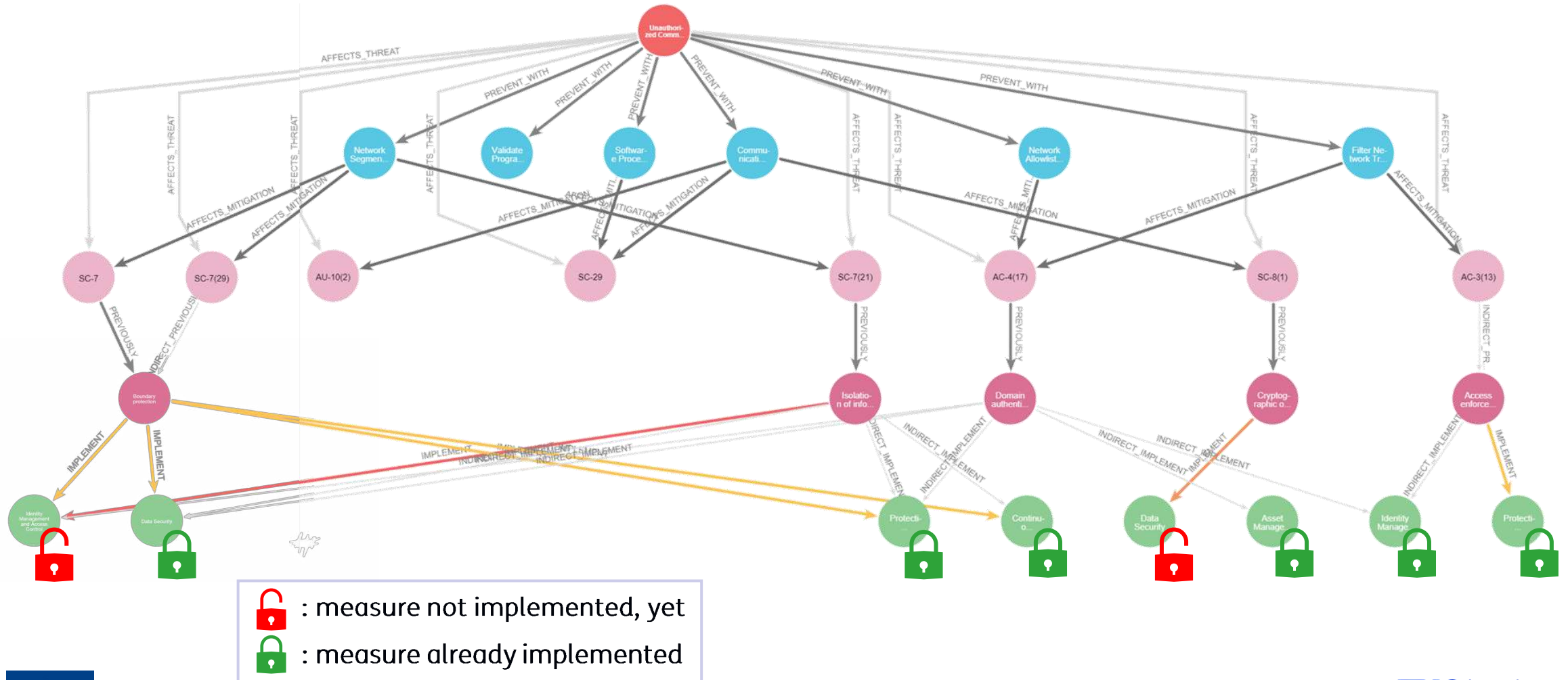


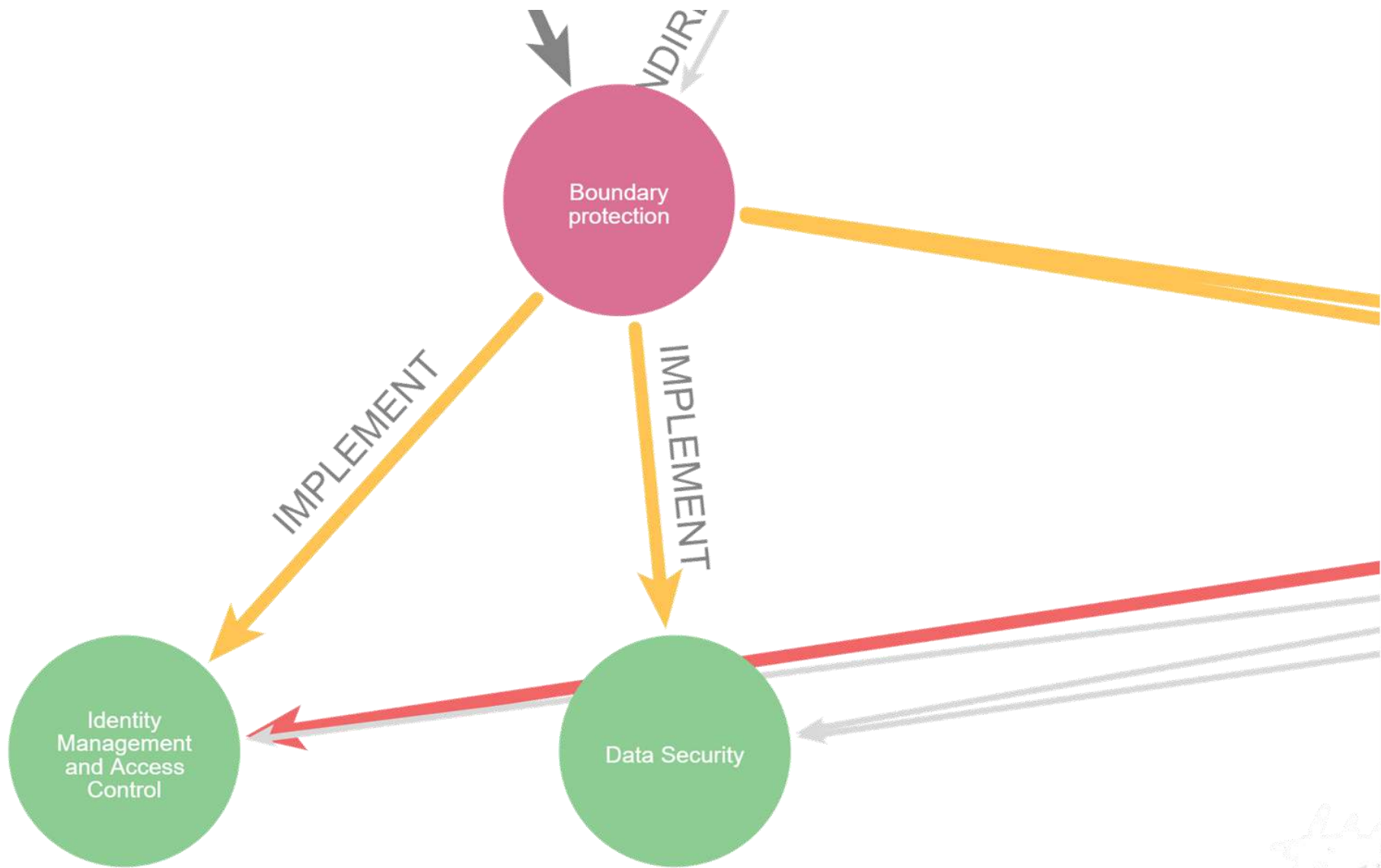
T0855: Unauthorized Control Messaging – Measures



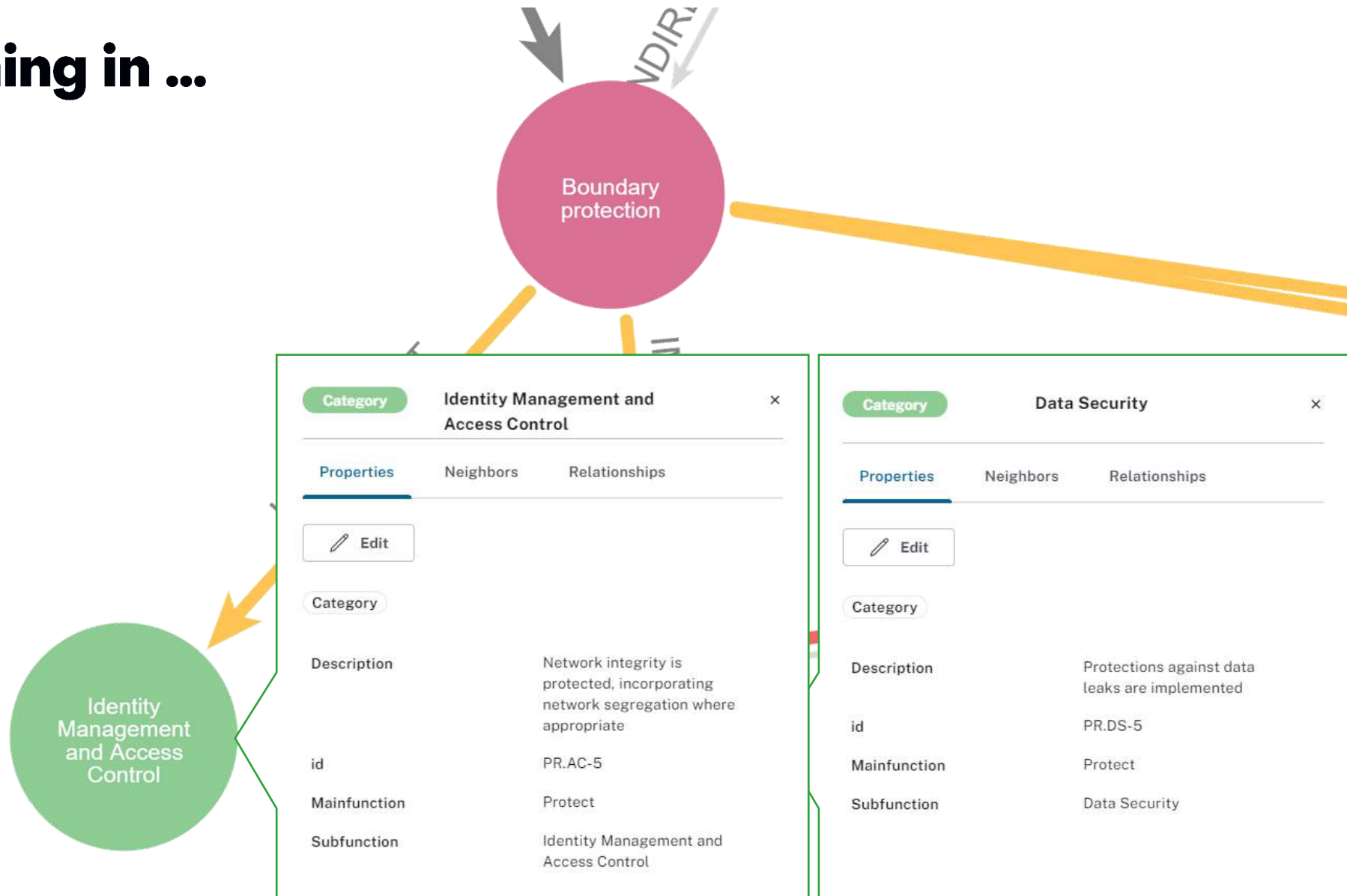
Use case outcome

Guideline measures to mitigate 'Unauthorized Control Messaging' in the current stage

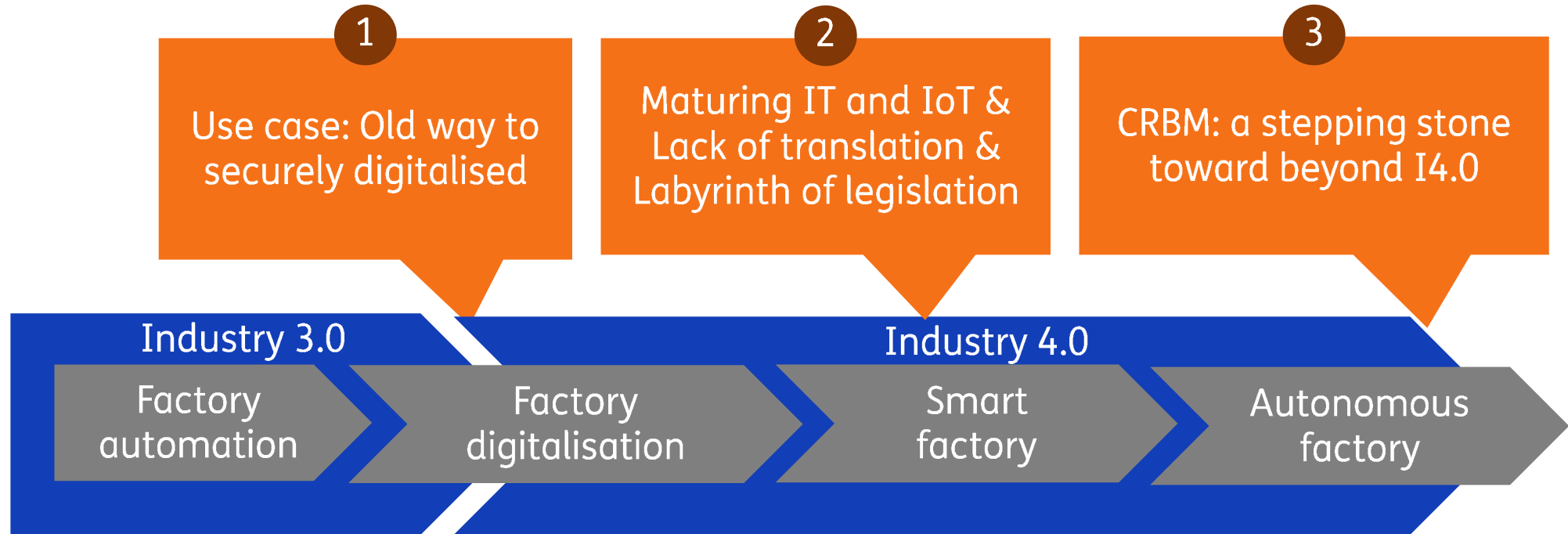




Zooming in ...



Conclusion



Beyond I4.0



Source : Nieuwsuur (2025, 21 september). Binnen in een Chinese 'Dark Factory' [\[Video\]](#).

Thank you

Bits & Chips Event 2025

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Cyber resilience for manufacturing blueprint