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Cybersecurity by Design in Banking: A Critical Need

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Agenda

1. Introduction
2. Cybersecurity Threats in Digital Banking
3. Cyber Security by Design (CSbD)
4. Key CSbD Strategies in Banking
5. Best Practices
6. Challenges and Future

About me

- Engineer Degree (MoD), MSc in Digital Forensics and PhD in Cyber Security Engineering from City, University of London
- 19 years in the Cyber Security Industry (Law Enforcement and Corporations)
- Certified Expert (CISSP, CPCI, Multi-GIAC Cert.)
- Currently Associate Professor and Director of the Cyber Security Research Centre at Londonmet
- Senior Advisor on Cyber Resilience (CSbD) in Banking (prev. Associate Director in Security Auditing at Kroll LLC)

Rapidly Expanding Banking Threat

Increased Cyber Threats: In 2023, 70% of global financial institutions reported being targeted by cyberattacks, a trend expected to grow in 2024.

Digital Transformation Drives Complexity: Global banks spend over $1.3 trillion on digital transformation, with cybersecurity a key focus.

High Stakes for Financial Systems: Cyber breaches cost financial services $265 million in ransomware damages alone in 2023.

“Authorised” Fraud in Banking

The global authorized fraud losses in the banking sector are estimated to be in the **hundreds of billions** of dollars

United States: The Federal Trade Commission (FTC) estimated scam-related losses at approximately **$158 billion** in 2023.

United Kingdom: Authorized push payment (APP) fraud accounted for a significant proportion of banking fraud losses, with figures nearing **£900 million** annually. Total Fraud is about **£2 billion.**

Middle East Context !

Emerging Cybersecurity Threats

Ransomware & Phishing: Ransomware caused $265M in damages in 2023. Phishing remains a top vector for data breaches.

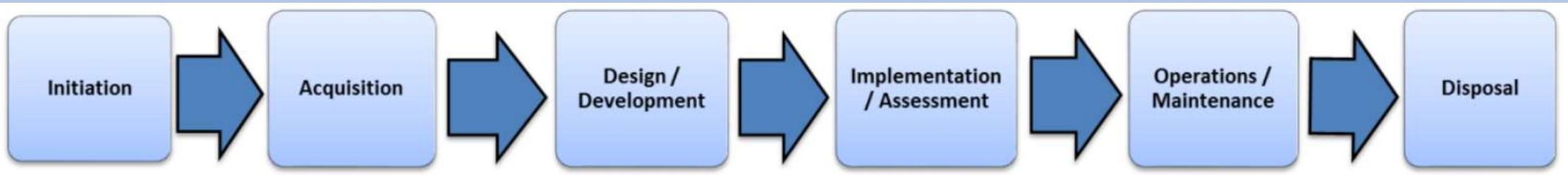
Evolving Malware Techniques: A dramatic 333% rise in malware targeting security controls was noted in 2024.

AI-Driven Cyber Hacking: AI automates attacks, exploits vulnerabilities, and bypasses banking security systems.

AI in Fraud: AI enables deepfakes, synthetic identities, and automated fraud to mimic legitimate transactions and evade detection.

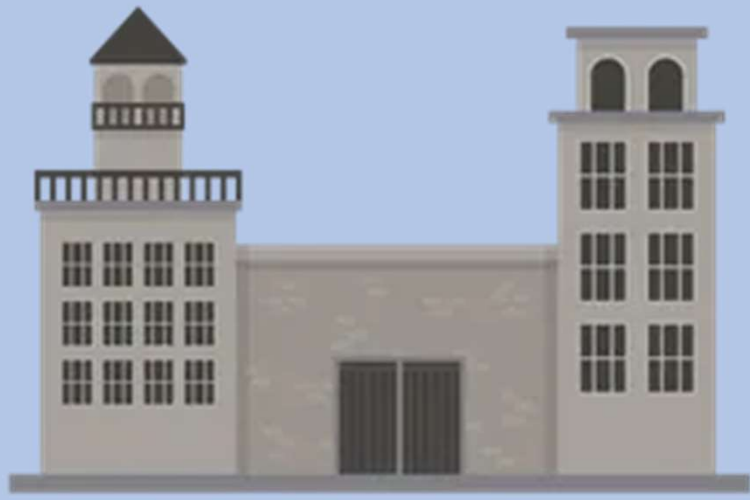
Systems Development Lifecycle

- Most organisations including Banks adopt a Systems Development Lifecycle (SDLC) methodology
- SDLC is multi-step lifecycle process and quite effective to protect computer systems against cyber threats is to integrate
- Costs and business performance often take precedence over security.
- Limited view on the asset's security before implementation stage



Cyber Security by Design (CSbD)

Hospital



Jail

What is the difference in term of design ?

Cyber Security by Design (CSbD)

- New approach to integrate security into every aspect of a systems design and development process with the aim of creating a secure final product.

- Relies on other stakeholders, including its contractors, technology developers and security experts to identify vulnerabilities within delivered capabilities and design effective controls to protect against exploitation.

- CSbD increased accountability will bring cyber security to the forefront of everyone's minds and help ensure that defence receives more resilient products

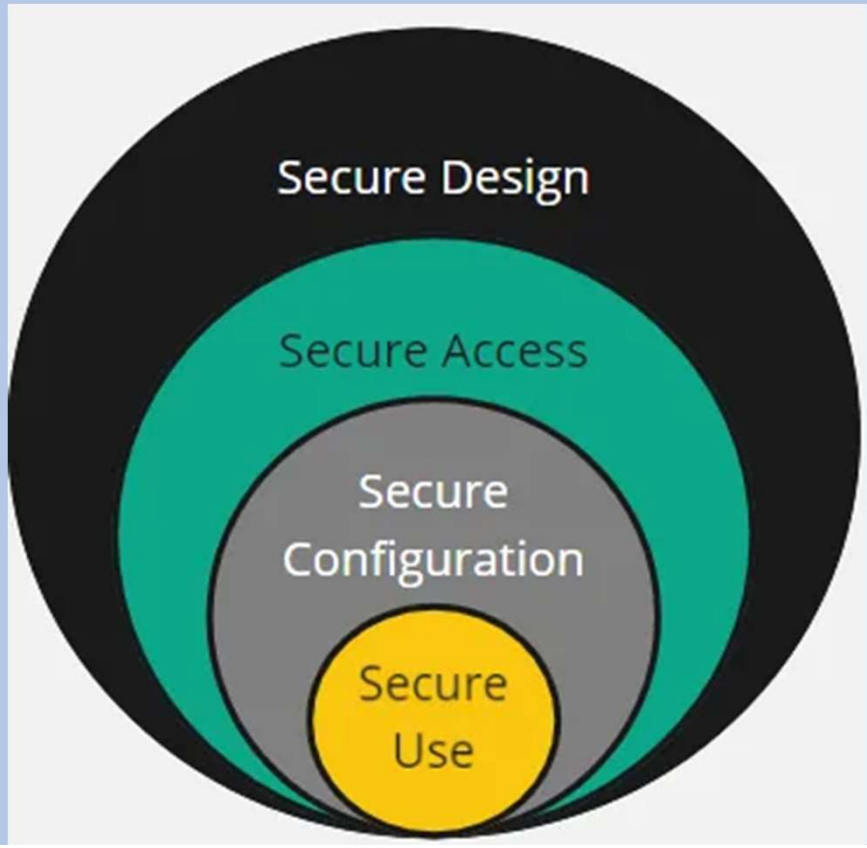
CSbD: The bigger picture

Secure Design: Strategies, tools, and processes to ensure secure design and deployment of banking systems, including digital platforms, customer applications, and internal systems for financial services.

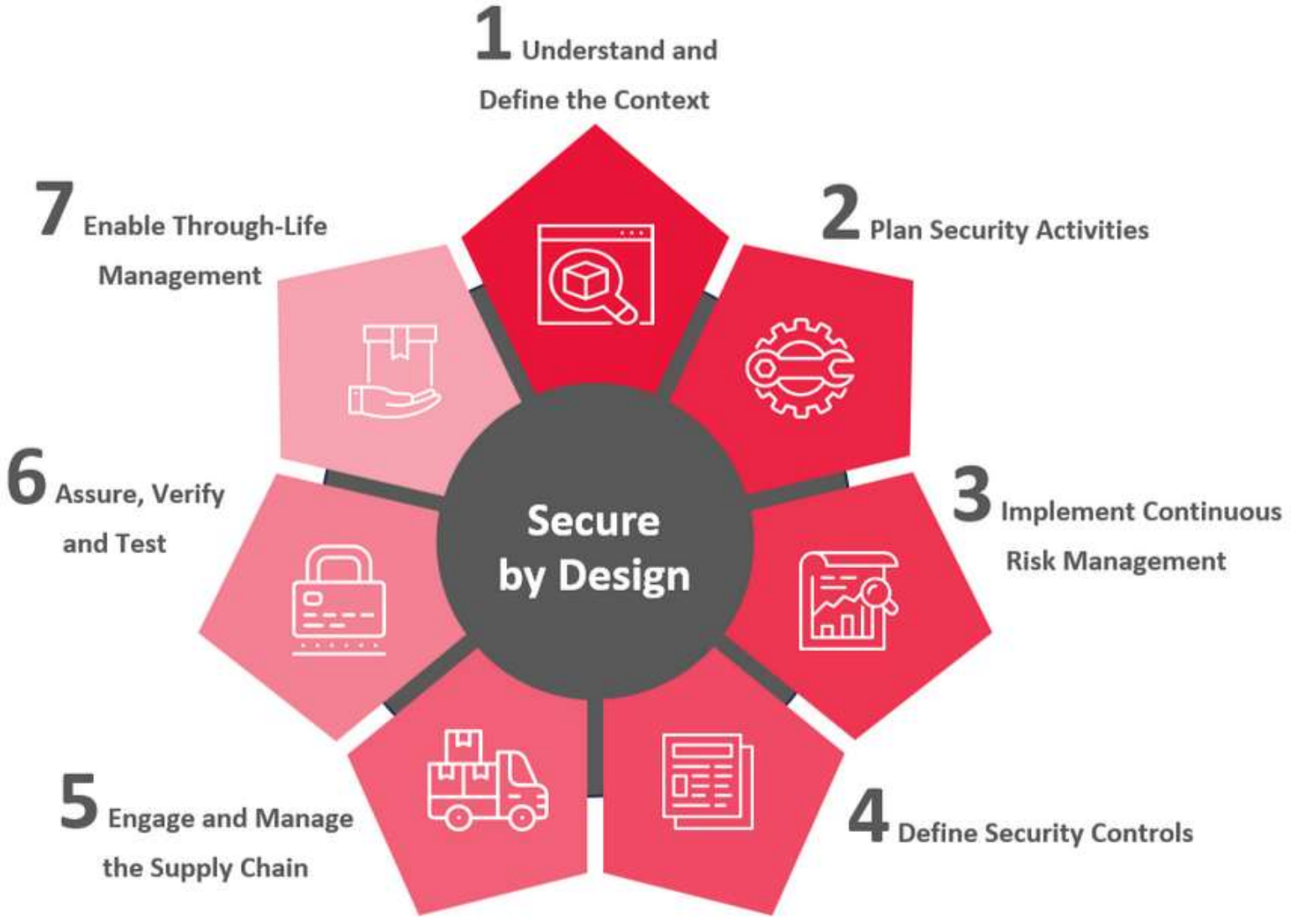
Secure Access: Protocols and tools to secure access to sensitive resources like customer data and transaction systems, regardless of location or access state.

Secure Configuration: Measures and tools to establish and maintain secure configurations for systems, applications, and network infrastructure across the enterprise.

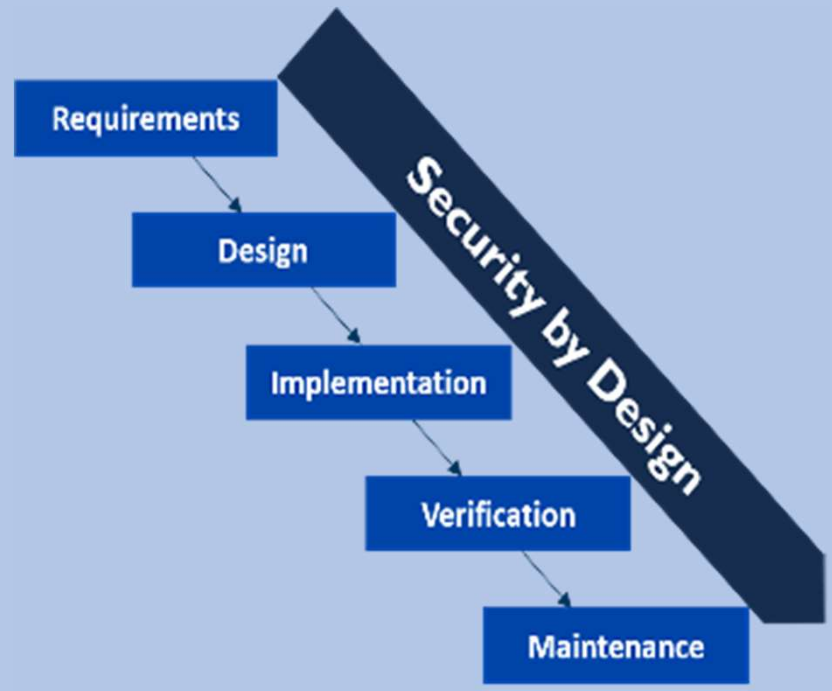
Secure Use: Procedures and tools to safeguard real-time use of data and systems, including transaction processing, data analytics, and customer interactions.



CSbD in Banking and beyond



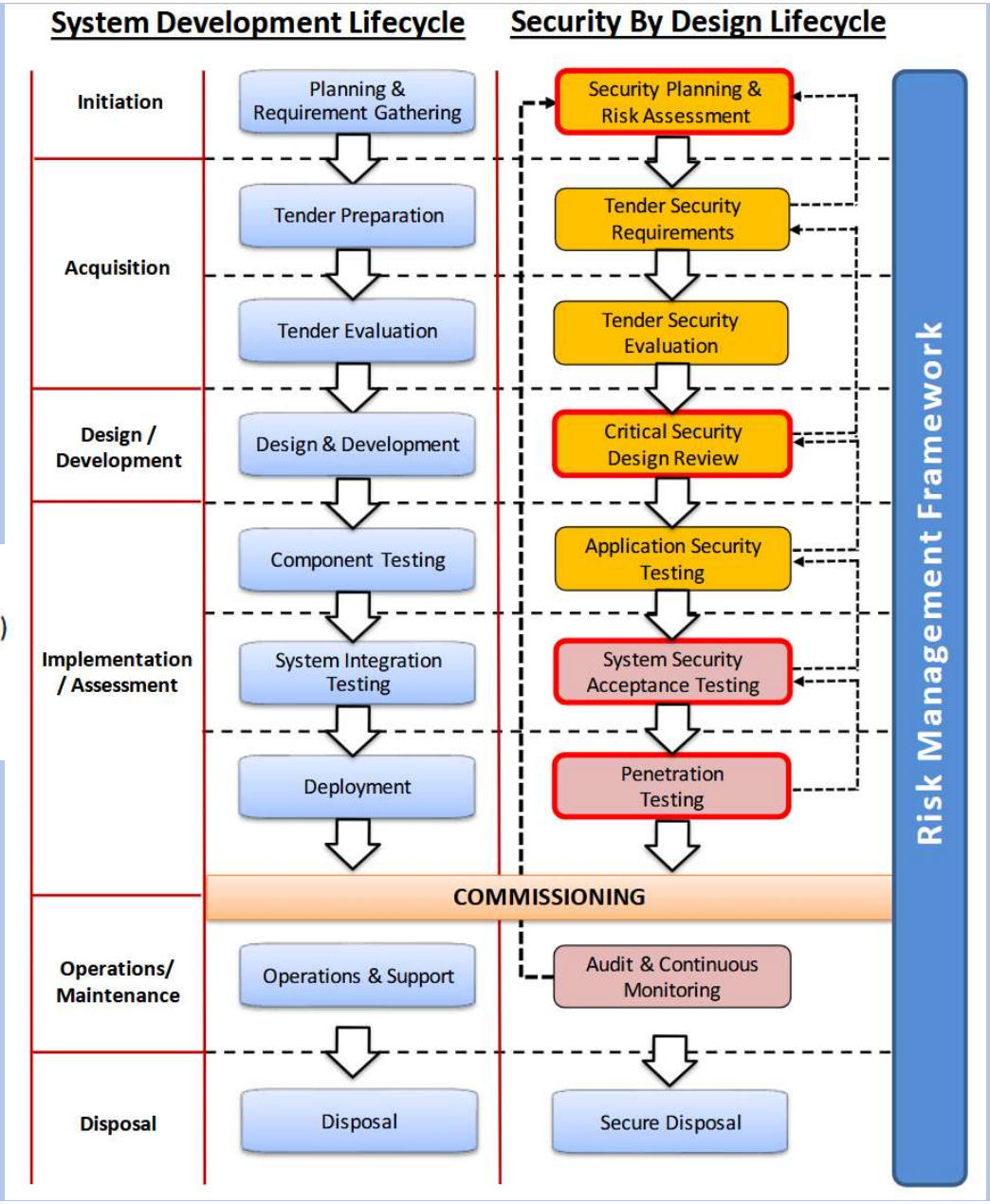
Principles (Consequences) of CSbD



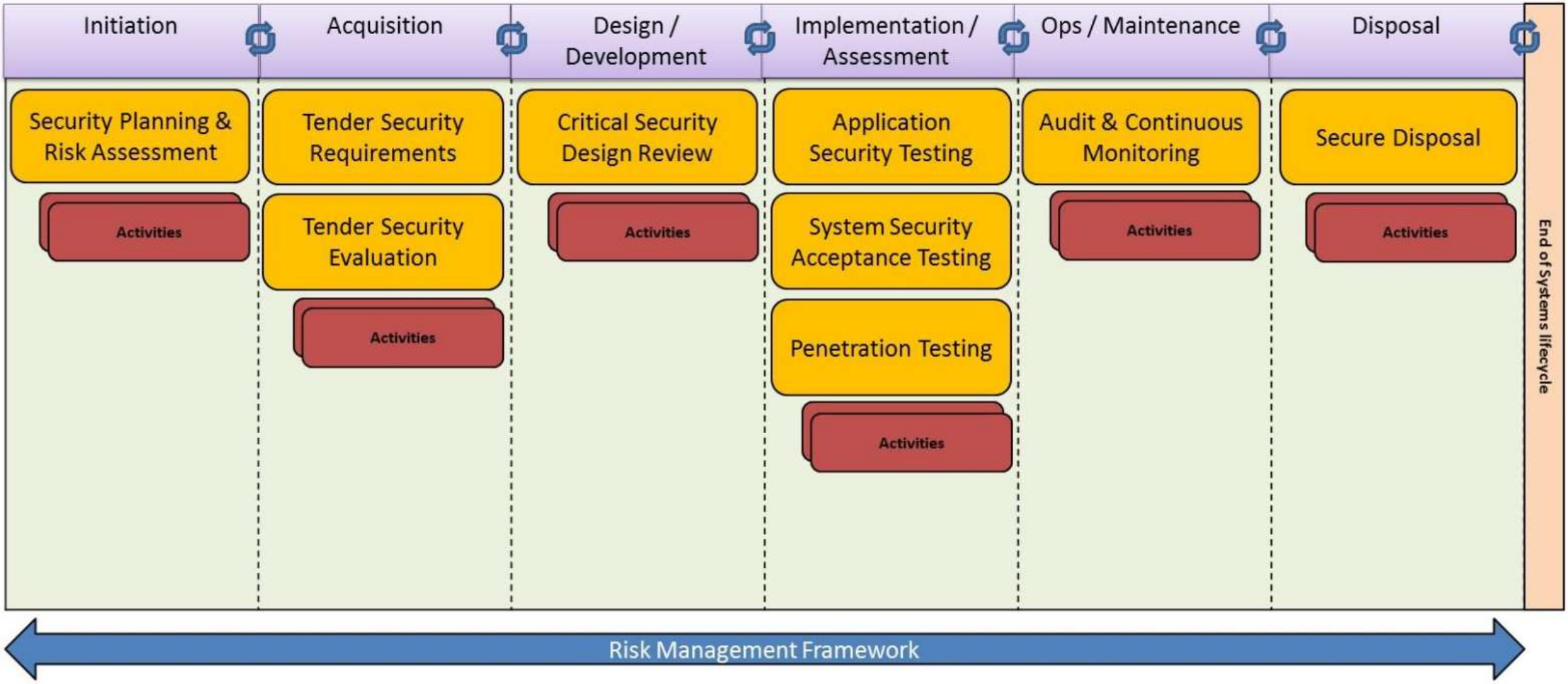
I. **Take ownership** of security outcomes
II. Embrace **transparency** and **accountability**
III. **Adapt (re-build)** organisational IT and product development

CSbD in Practice

- Performed by Project Team
- Performed by Security Officers (Security Consultants if project team does not have expertise)
- Performed by Independent Third-Party Assessor
- Milestones / Deliverables to Steering Committee



Implementing CSbD



Key Strategies for Security by Design in Banking

Benefits of Secured by Design

- Assurance that is **embedded** within capability process
- Addressing **new threat** more regularly
- Improving security awareness by incorporating far **more stakeholders**
- **Holistic view** on the capability thus more vulnerabilities being identified
- **Reducing** the requirement for new projects (saving precious resources)
- **Quality, Trust and Confidence** in internal capabilities

Challenges and considerations in CSbD

1. **Balancing** security with usability
2. Increased development **costs**
3. **Resource** constraints
4. Keeping pace with **evolving** threats
5. **Legacy** systems and Technical debt

How Artificial Intelligence can contribute ?

Automated Risk Assessment: AI analyzes system architectures to predict risks and recommend secure design improvements.

Secure Code Development: AI-powered tools identify and fix security flaws in code, ensuring secure software development.

Adaptive Security Measures: AI enables dynamic, self-learning security protocols that adapt to evolving cyber threats in banking systems.

Enhanced Access Controls: AI strengthens authentication, like biometric verification and behavior-based access monitoring, during system design.

Compliance and Monitoring: AI ensures banking systems comply with security standards and continuously monitors for design vulnerabilities.

Future of CSbD in Banking

Late Technology Adoption: Delayed digital transformation can be advantageous for **Cyber Security by Design (CSbD)**, as newer systems can integrate advanced security measures from inception, avoiding legacy vulnerabilities.

Secure Communication: Implement secure-by-design protocols and AI-optimized encryption techniques to ensure safe and efficient transfer of sensitive financial data.

Robust Defenses: AI-driven frameworks proactively detect, prevent, and mitigate cyberattacks during system design, ensuring system resilience and integrity.

Scalable Frameworks: Adaptive AI-based systems, such as federated and reinforcement learning, enable secure and scalable solutions to support growing and diverse banking infrastructures

Thank You

Questions ?