

What does it Take to Create the Digital Thread

in Complex Systems Development?

Erik Herzog, Ph.D., CSEP

Saab Technical Fellow - Systems Engineering



Introduction – Saab Aeronautics

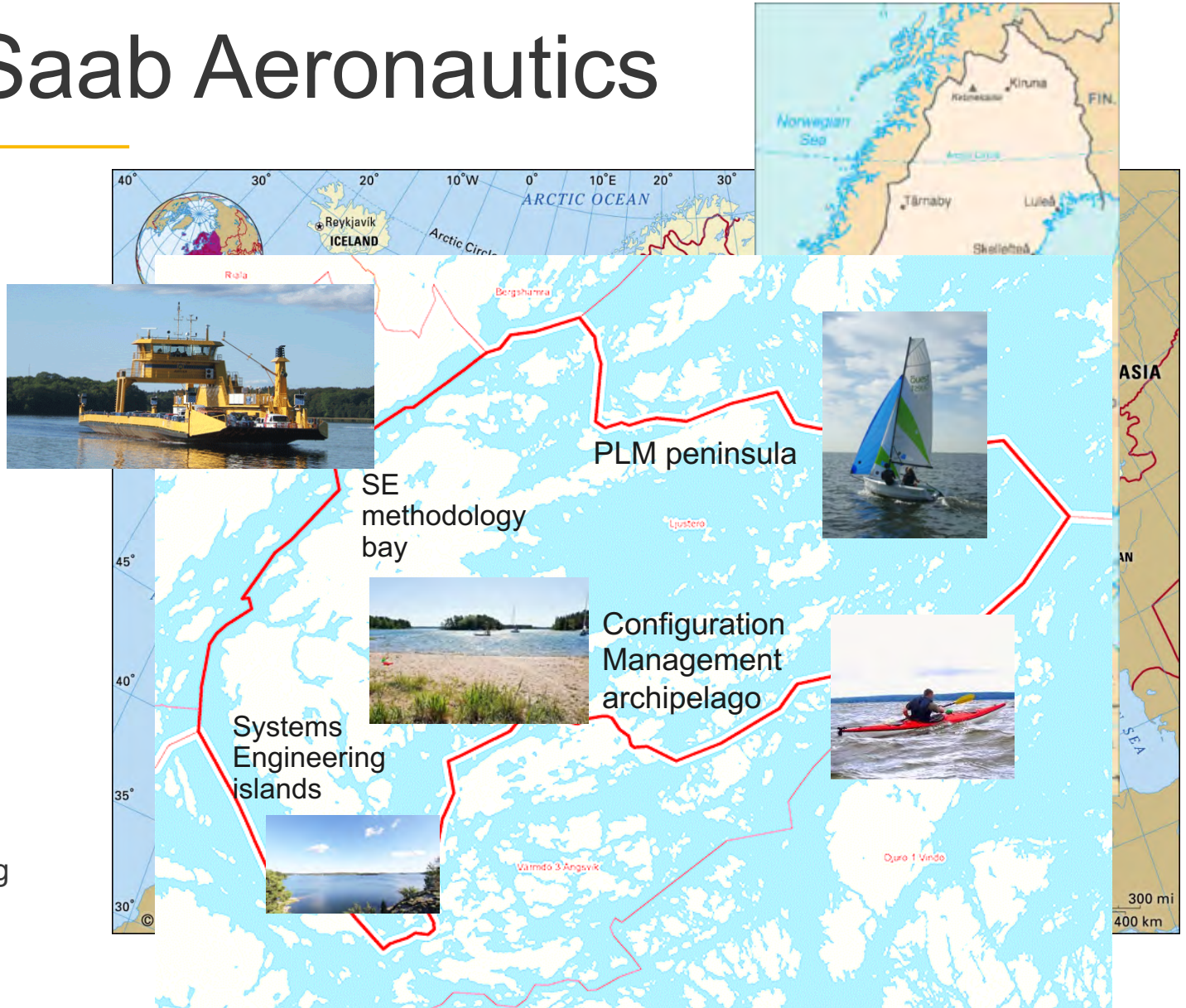


Erik Herzog @ Saab Aeronautics

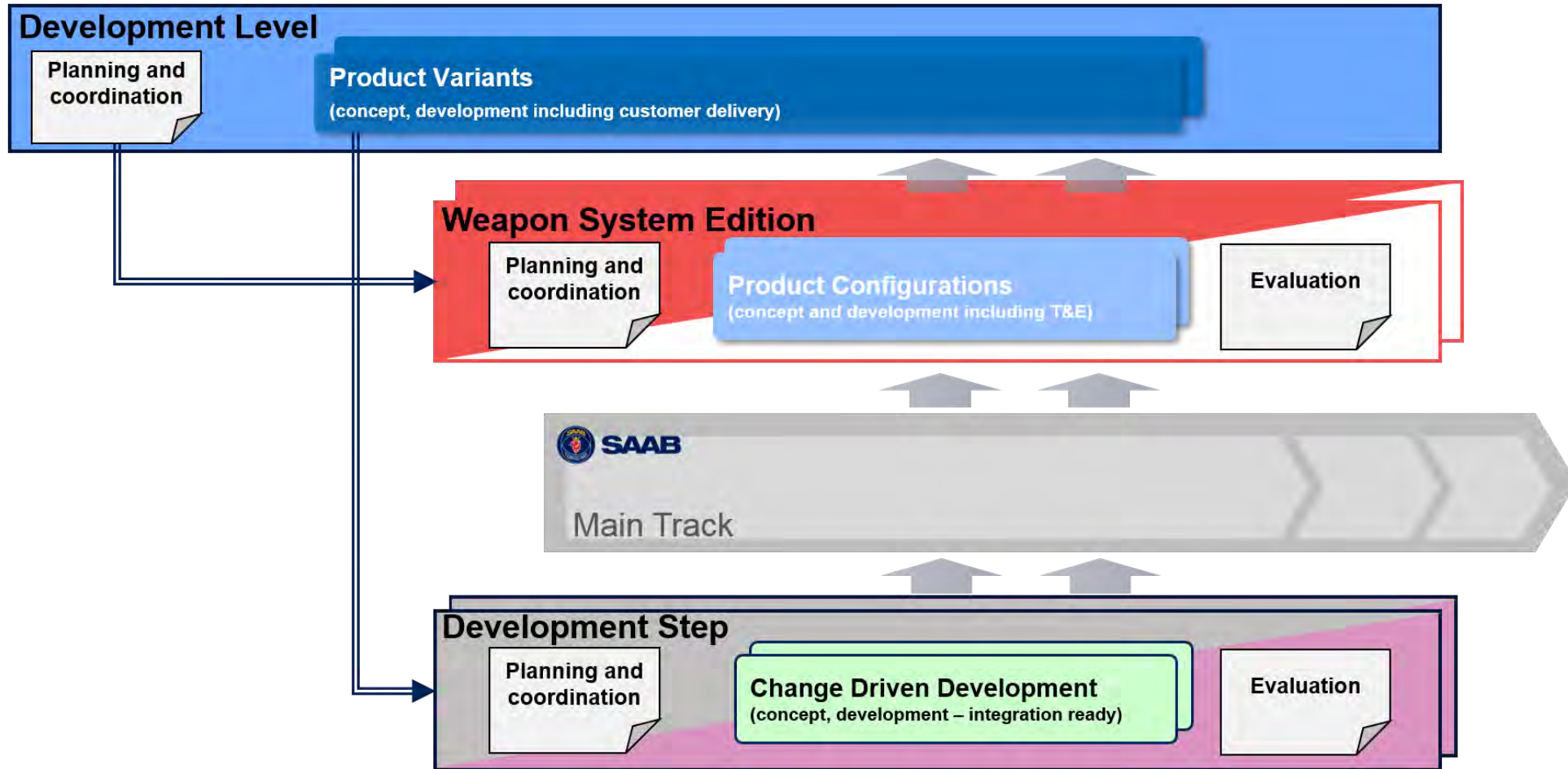


- Systems Engineering
 - Applied in product development
 - Methodology development & mentoring
- Change leadership

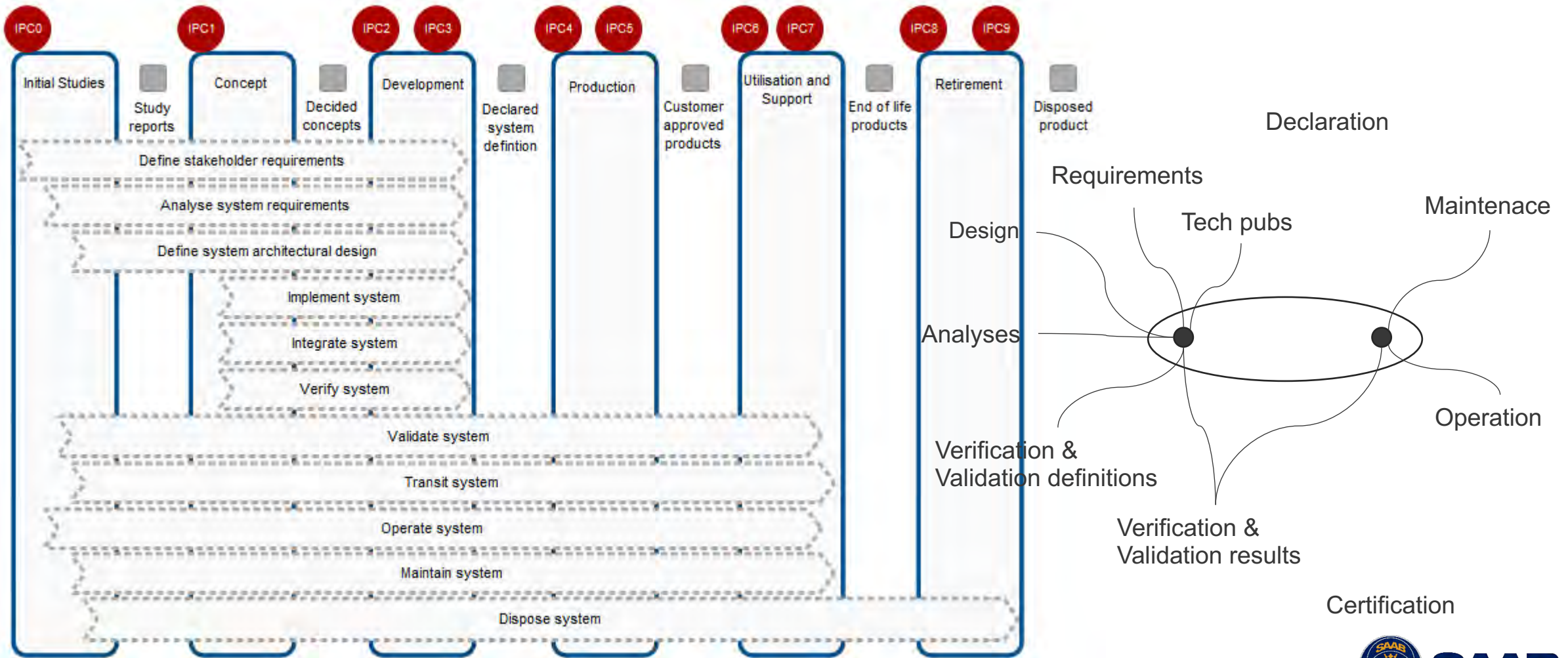
President INCOSE Sweden chapter



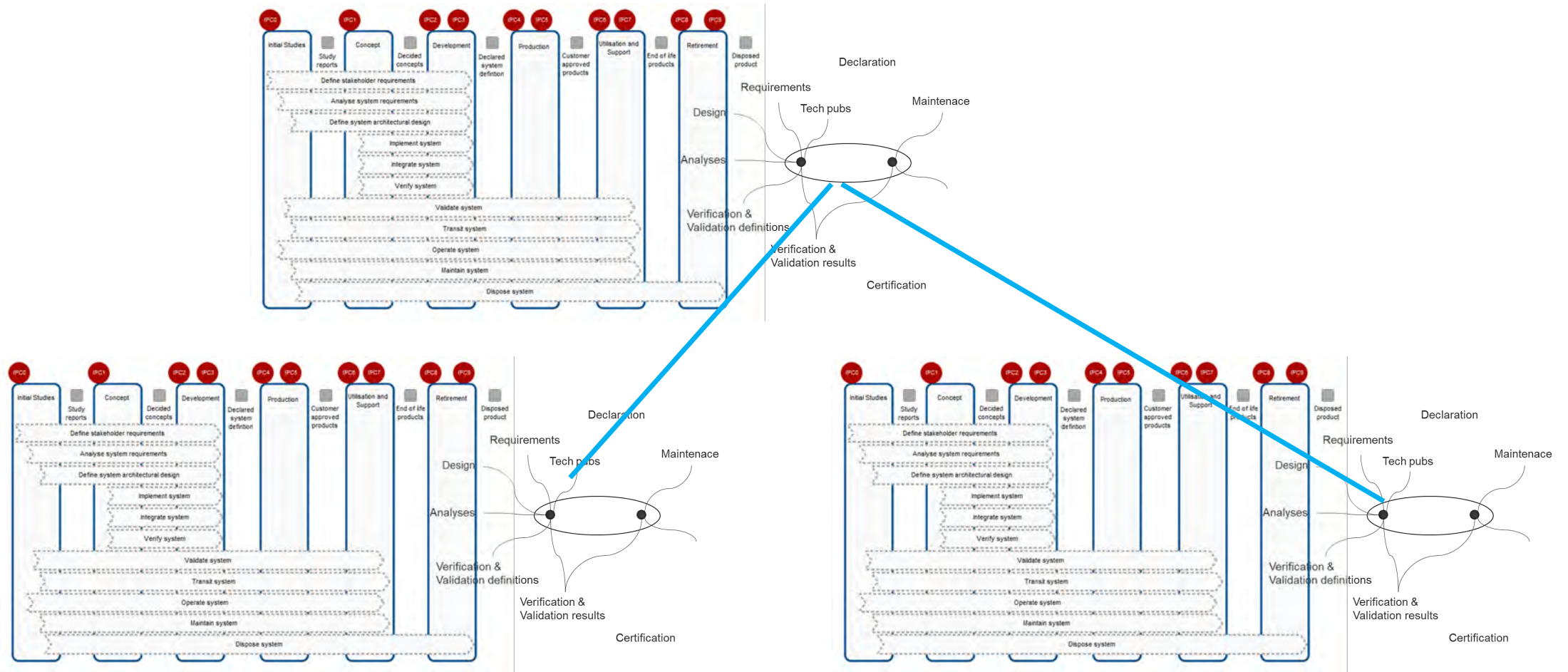
Systems Development @ Saab Aeronautics



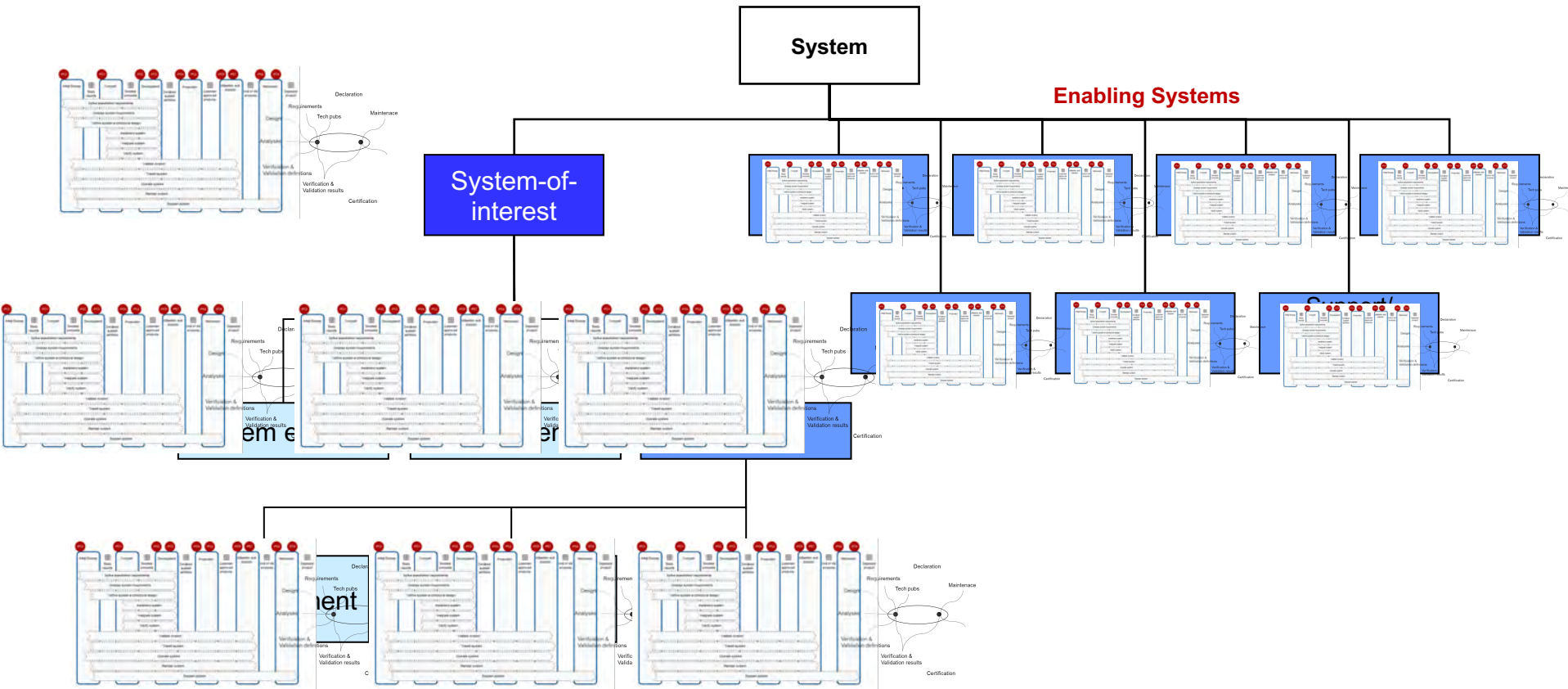
Thread – as defined by process



System subsystem thread



System – enabling system thread



System – test system thread



How well does the models in a test rig represent the real aircraft?

- Need to capture Model Credibility for test worthiness declaration
- Model Credibility is dynamic and our understanding in a model's credibility will change over time

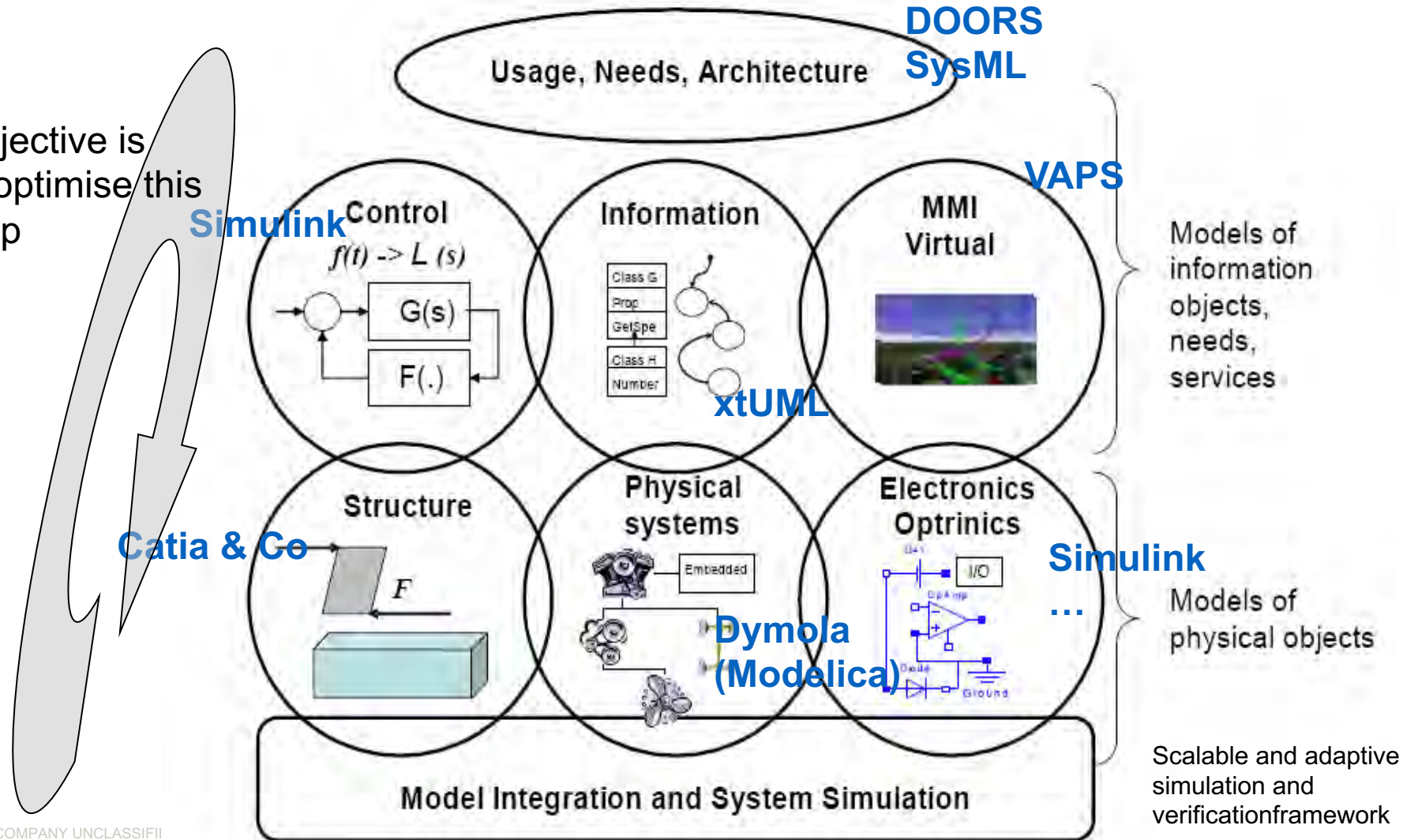


When threads break

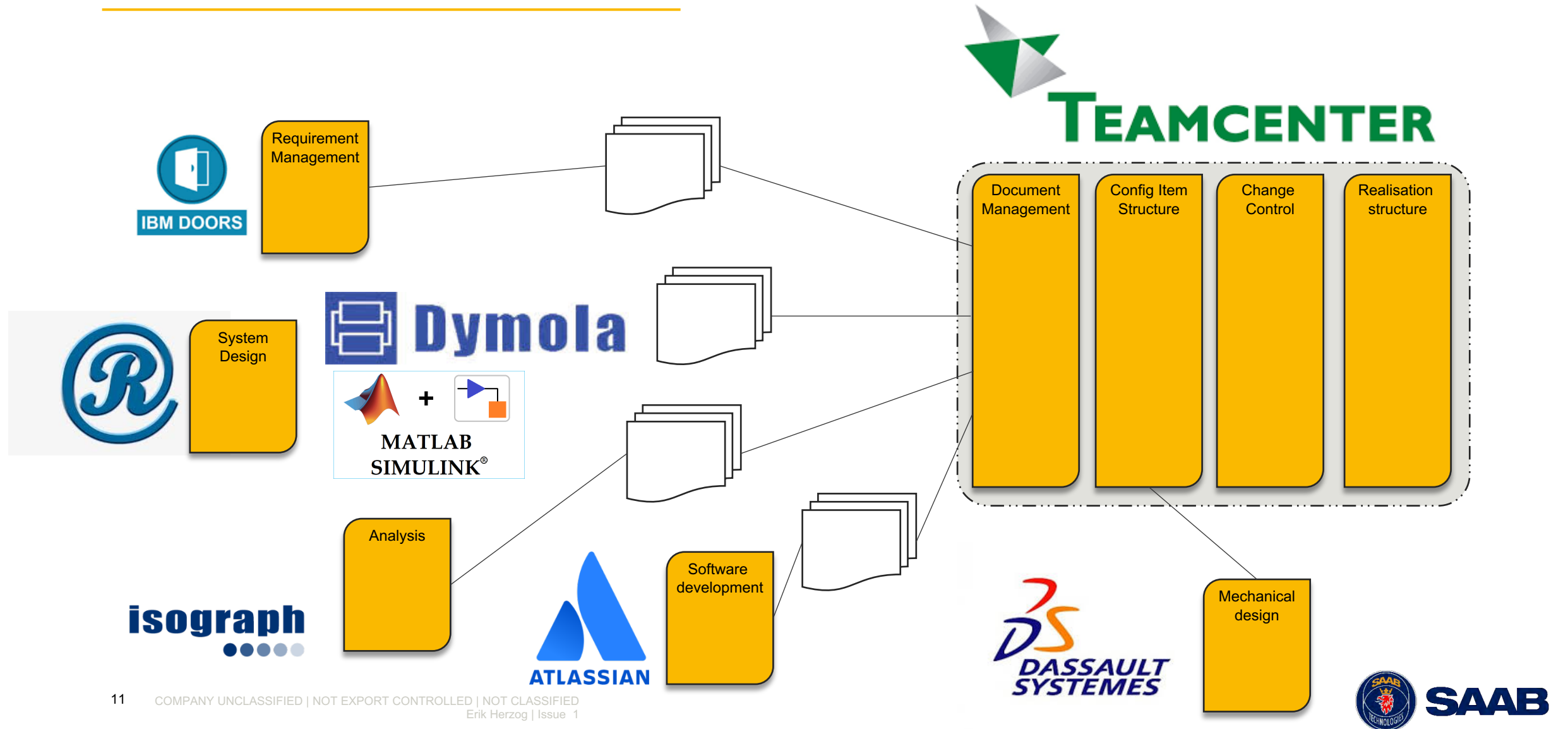


Using models in systems design

Objective is to optimise this loop



Actual development tool landscape



Digital thread, what does it take?

- A competent organisation – coordinated by process
 - Attention to detail
 - Communication across discipline boundaries
- Active Product – Enabling system coordination
- In fact, the current support for maintaining a digital thread is mediocre – at best
 - Lots of switching between poorly integrated tools
- Depend on the work by dedicated people
 - **Professionalism, Persistence and Patience**



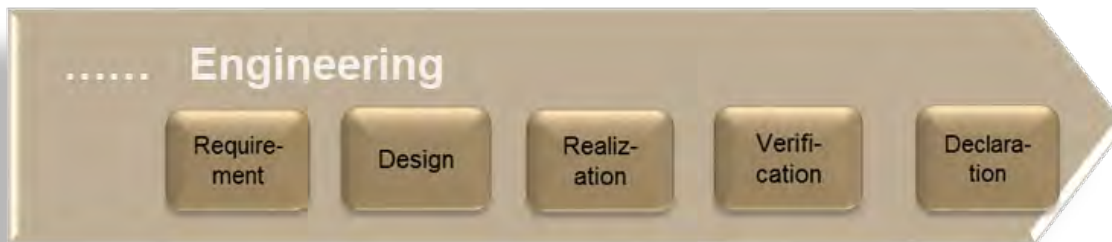
Strengthening the thread

Digital thread – fineness transition

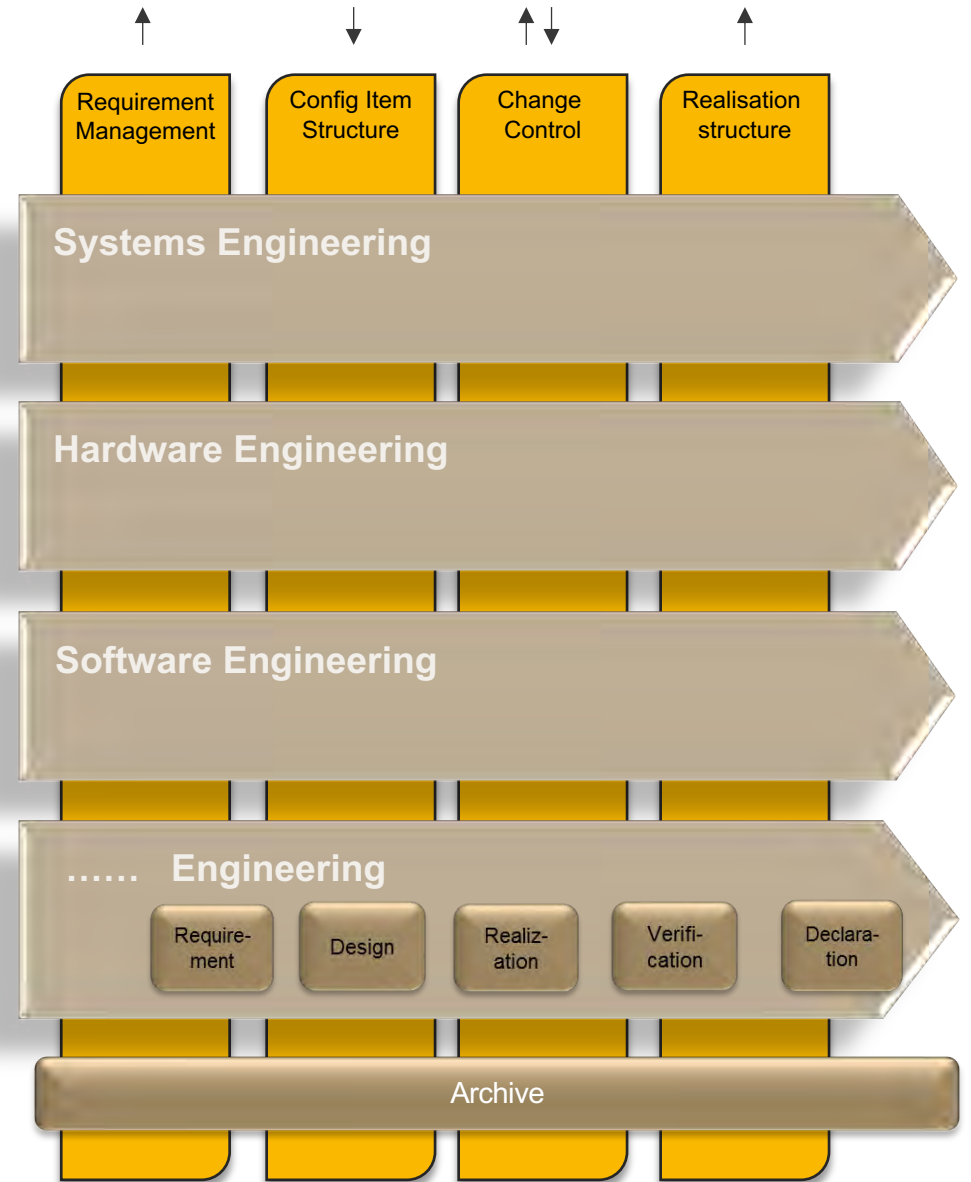


Genesis PLM Model

- Engineering Disciplines
- Engineering Deliverables

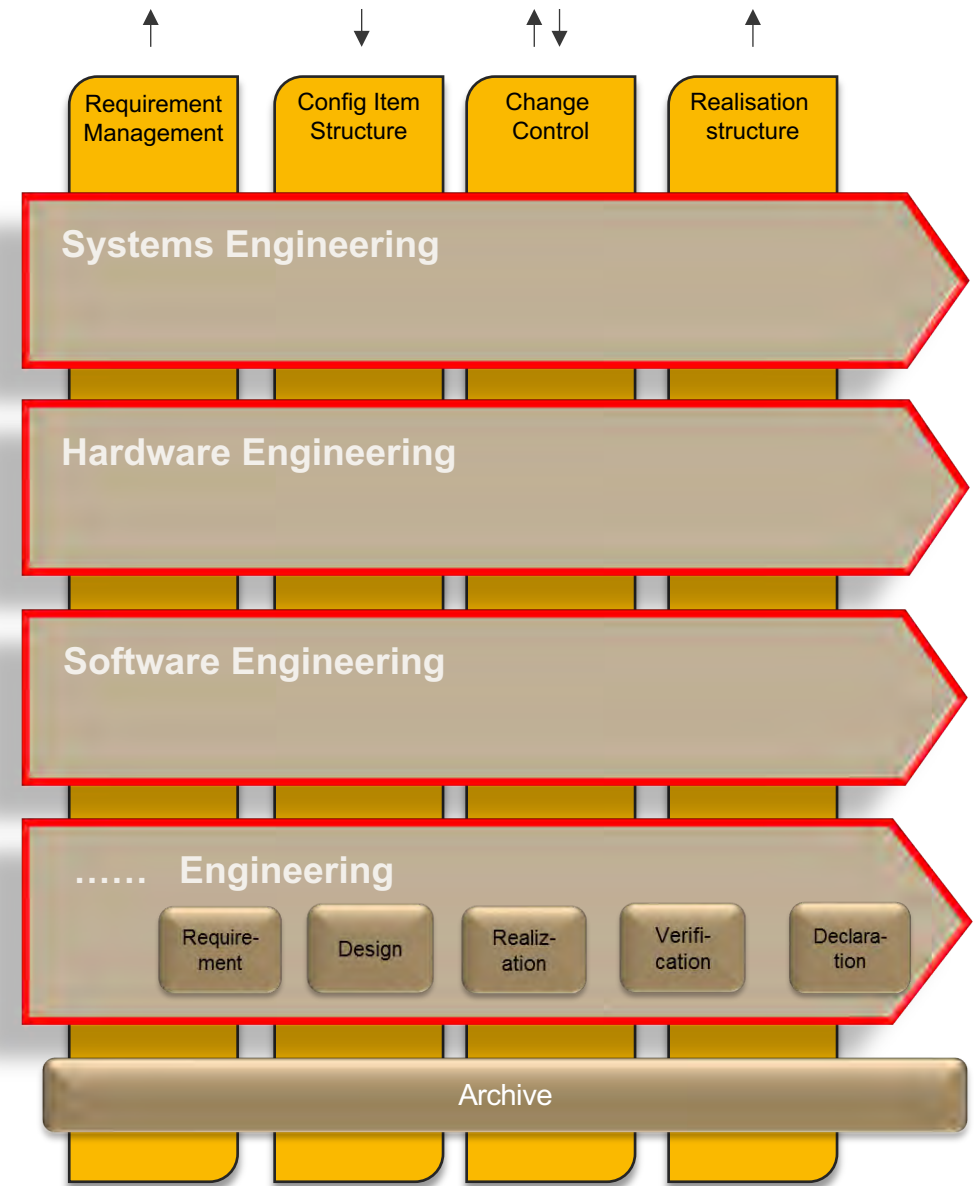


- Design Traceability Dimensions
 - We believe there are four of them only
- Archiving



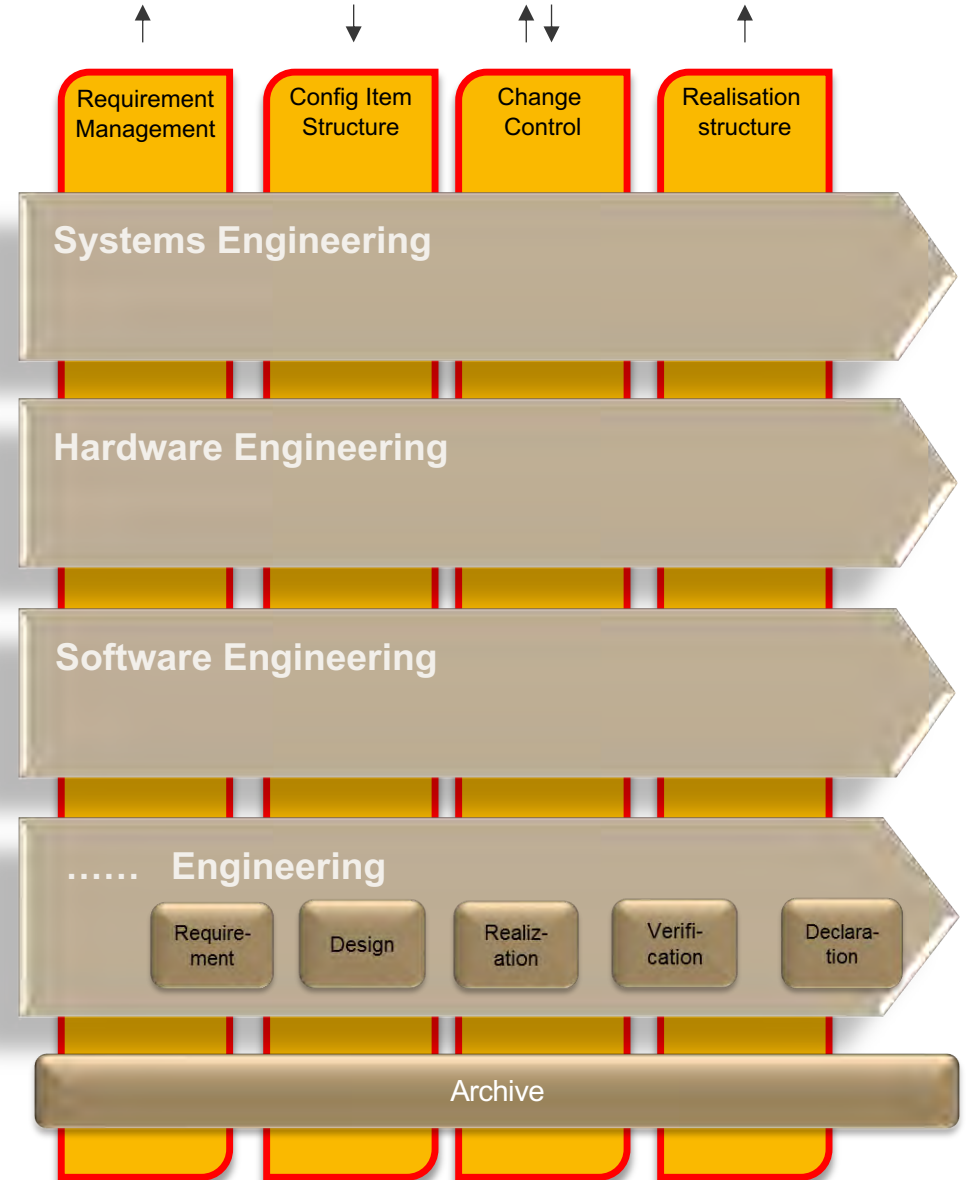
Modularity

- Optimise support for each engineering discipline
 - Maximise automation, as provided by the supplier
 - Minimise application family switching
- Bring together management and engineers in a single environment
 - E.g., Change management and Status reporting
- Ability to upgrade individual capabilities independent of others
- Ability to replace environment without upsetting the complete PLM landscape



Traceability

- Need capability to ensure traceability and integrity of product data
- Traceability dimensions between engineering discipline environments
 - Requirements
 - Configuration item structure
 - Change management
 - Realization
- Configuration Management capability required for Requirements Traceability, Configuration item structure and Realization structure
 - Versions and baseline capability
- The OSLC standard offers the desired capabilities
 - But is still not widely implemented



Summary

- Presentation of a high level Enterprise PLM landscape model
- OSLC appears to be a key enabler for realisation
- Status
 - The intended architecture for future programs
 - Still initial phases
 - Will have a substantial impact on our organisation
- We are very much open to discuss and share ideas with other industry players on how to realise the future PLM landscape
 - To strengthen the digital thread!

