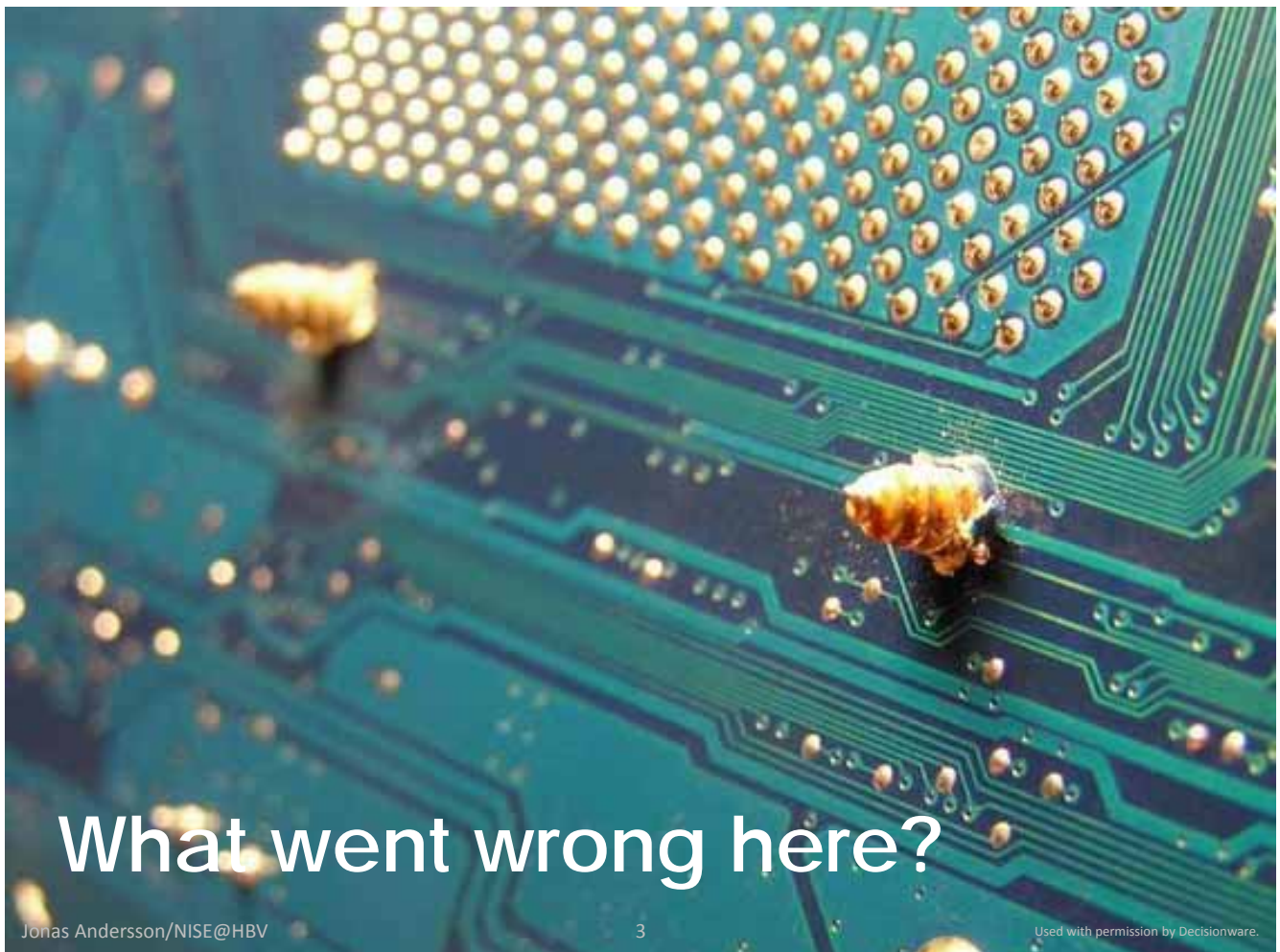




A reflective introduction of Systems Integration

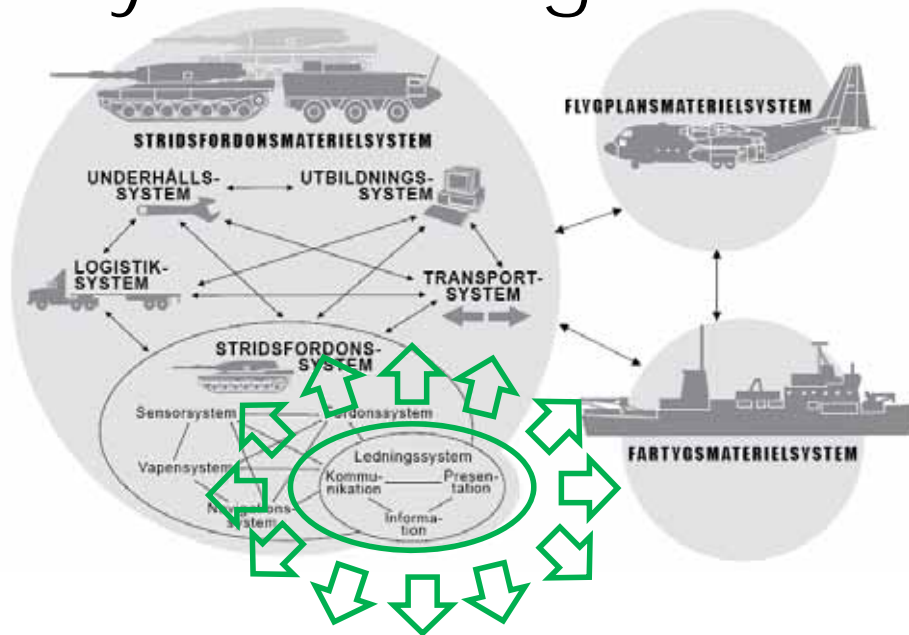
—
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What went wrong here?

My first encounter with systems integration



System-of-interest:

Andersson et al: Lärobok i militärteknik del 3 – Teknik till stöd för ledning

“the system whose life cycle is under consideration..”

ISO/IEC 15288:2008, 2014

Purpose of: “System(s) integration”

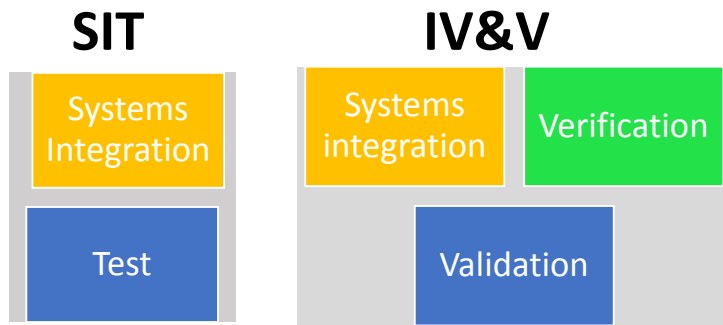
The ultimate goal of system integration is to ensure that the individual system elements function properly as a whole and satisfy the design properties or characteristics of the system.

sebokwiki.org

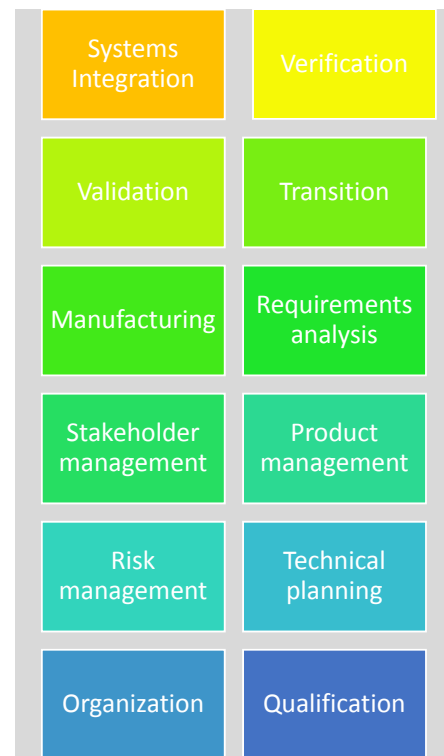
The purpose of the Integration Process is to assemble a system that is consistent with the architectural design.

ISO/IEC 15288:2008

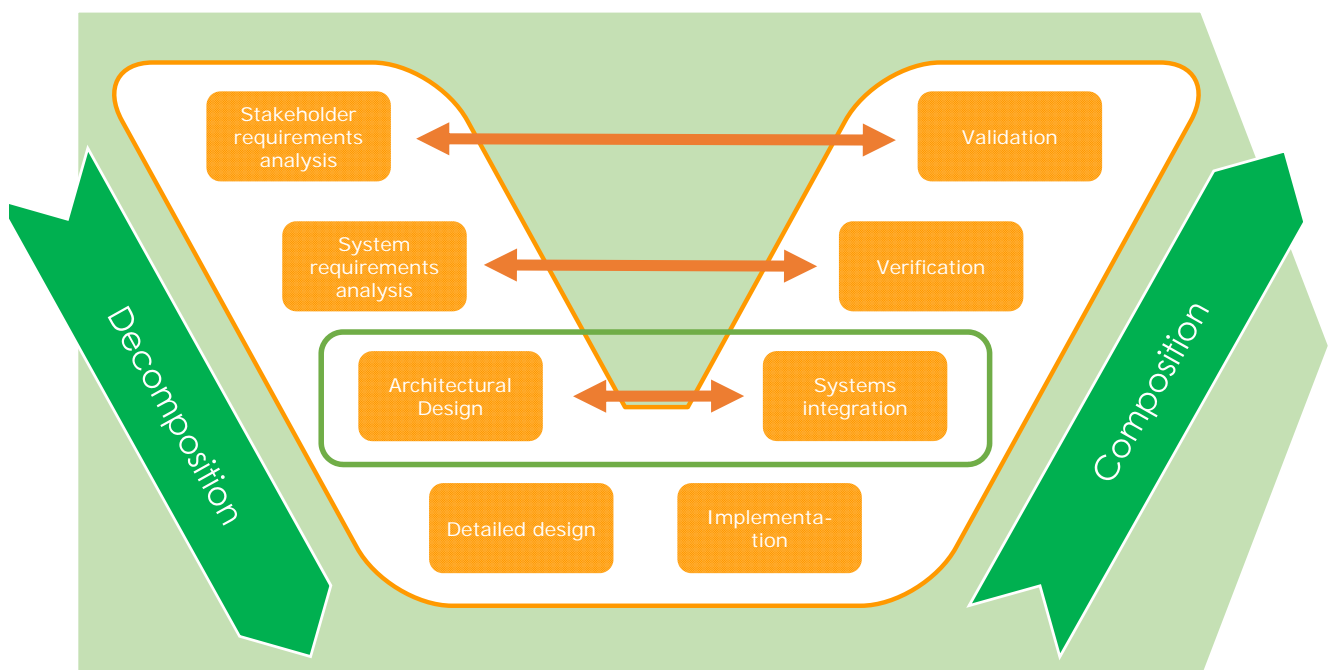
Scoping systems integration away from the stovepipe



Systems integration



Integration and the Development lifecycle



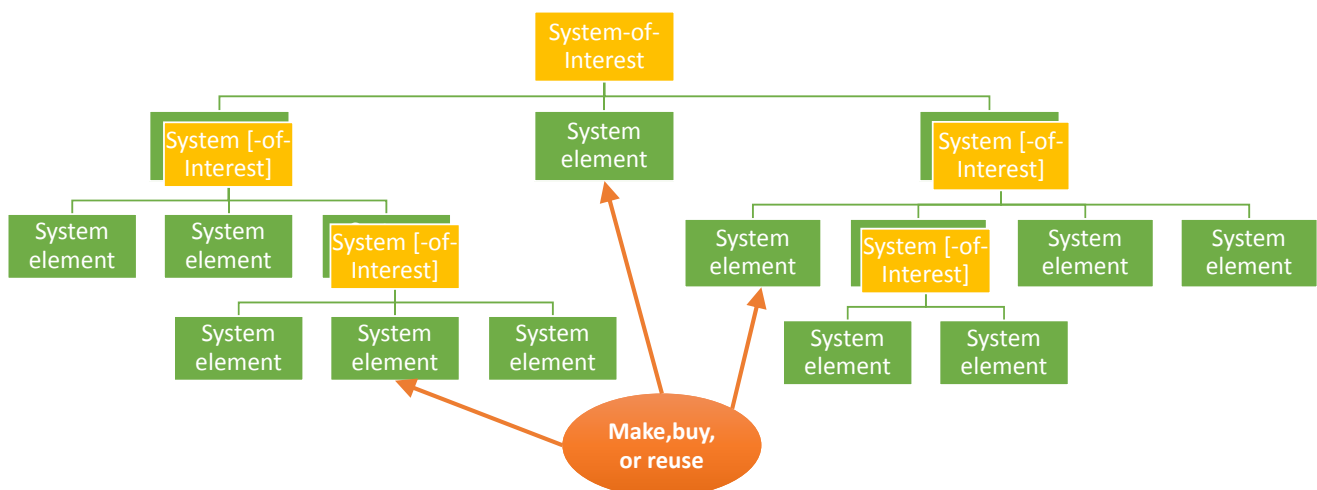
An analogy about mindsets...

- The Designer
 - Decomposes the needs of the stakeholders into a solution within the system context as specified (or as understood from specifications).
 - Keeps a watchful eye on the complex reality
- The Integrator
 - Gradually composes elements into a useful product that provides value to the stakeholders
 - Keeps a watchful eye on the design as described by the requirements and the architectural description



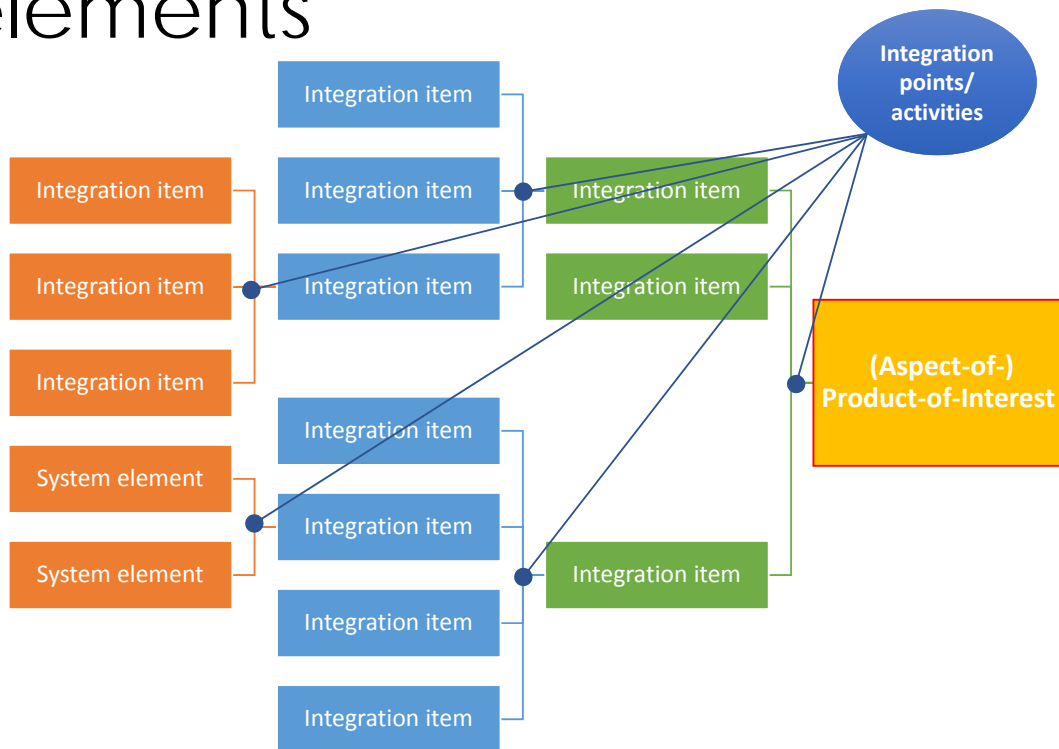
Freely based on an observation by Dr. Mike Pennotti, Stevens Institute of Technology

Conceptual decomposition of systems and elements



Derived from INCOSE Handbook version 3.2.2, and ISO/IEC/IEEE 15288:2008

Integration sequence of elements



Why integrate?

- Support verification and perhaps validation?
- Support acquisition of a product?
- Support transition to customer?
- Enable effective manufacturing?
- Optimizing a product family/line?
- Support modification/reengineering?
- Qualify the product?
- Use the product in a new environment?
- Increase the market of the product?



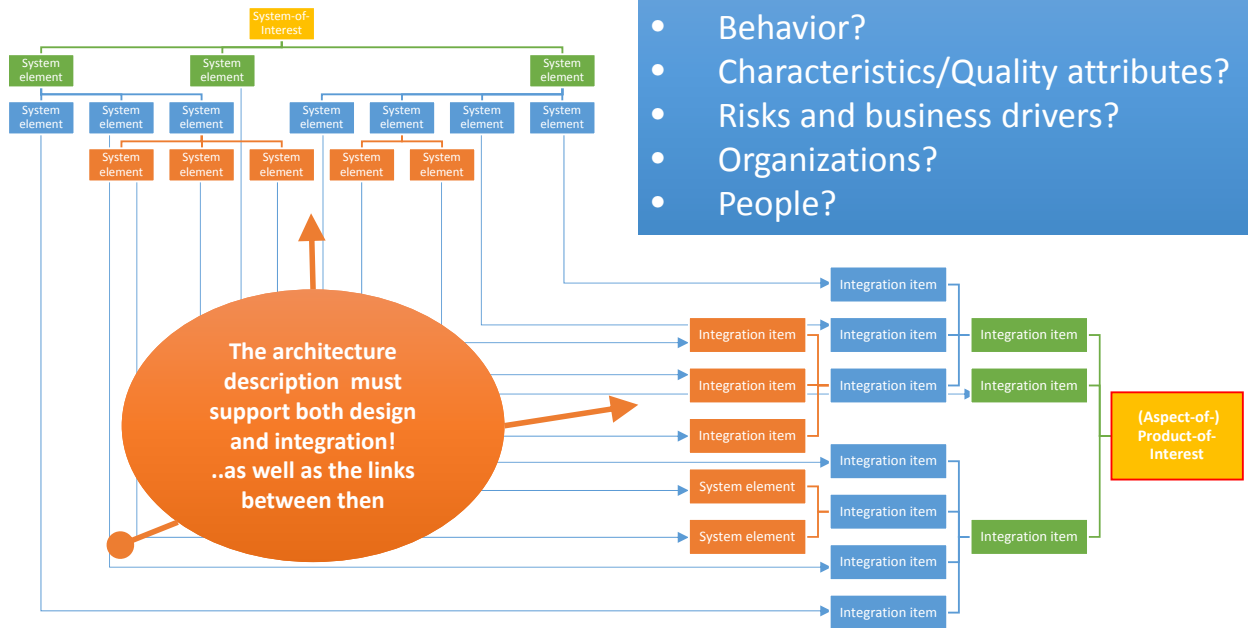
Photo: Jonas Andersson



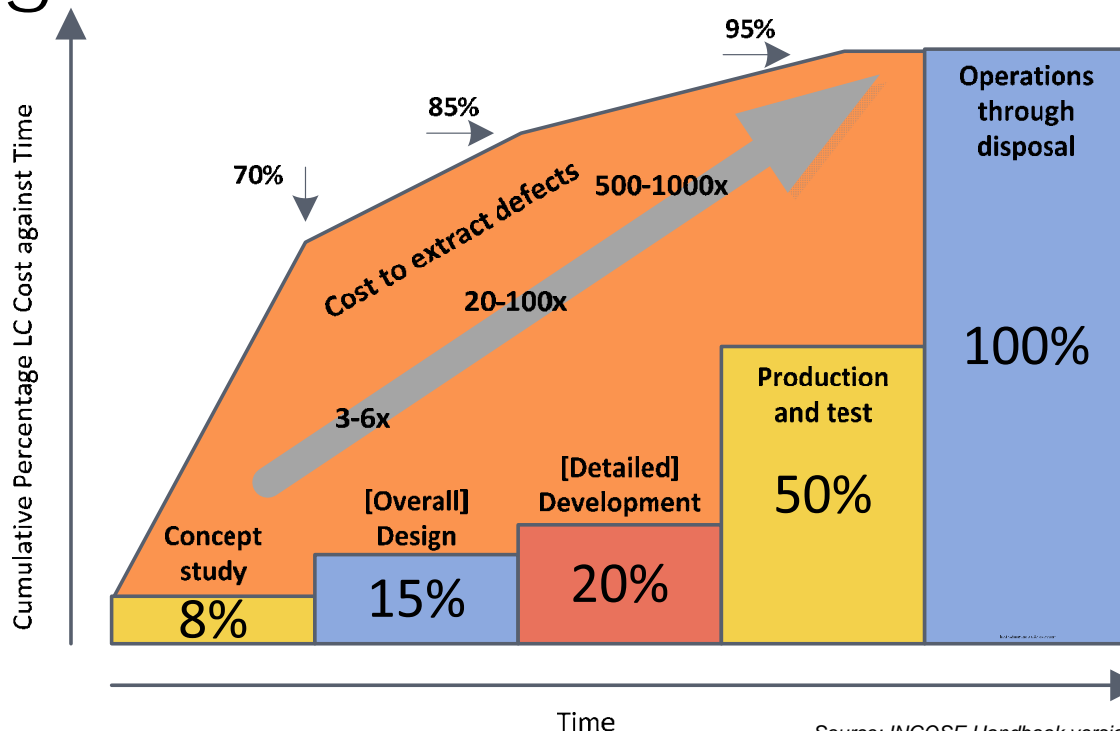
Photo: Jonas Andersson

What and how to integrate?

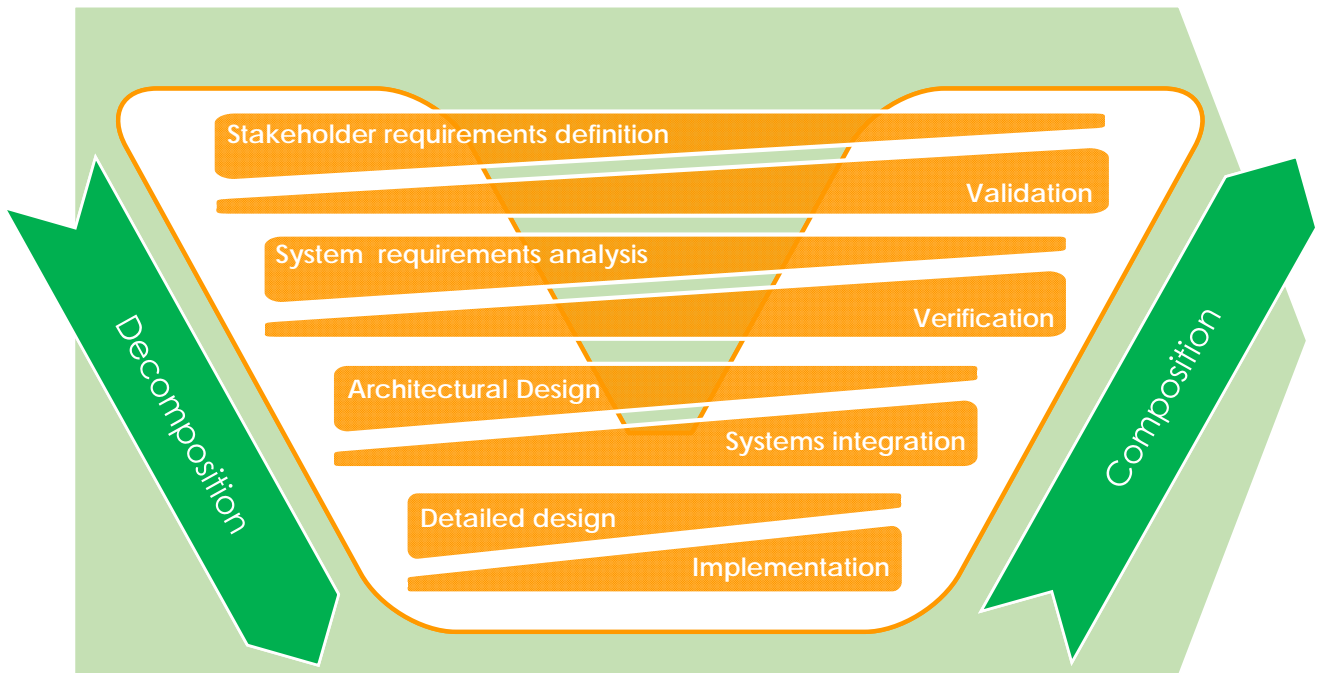
- Physical elements?
- Functions?
- Behavior?
- Characteristics/Quality attributes?
- Risks and business drivers?
- Organizations?
- People?



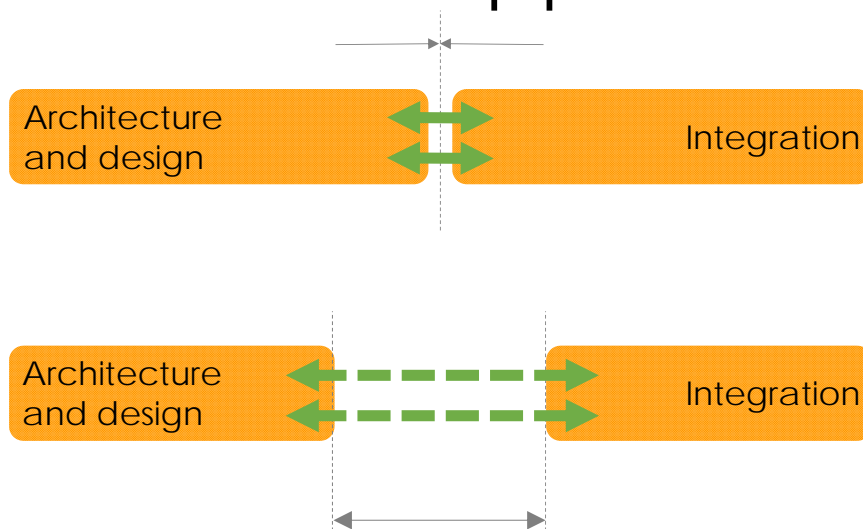
Committed Life Cycle Cost against Time



"Collapse the Vee"

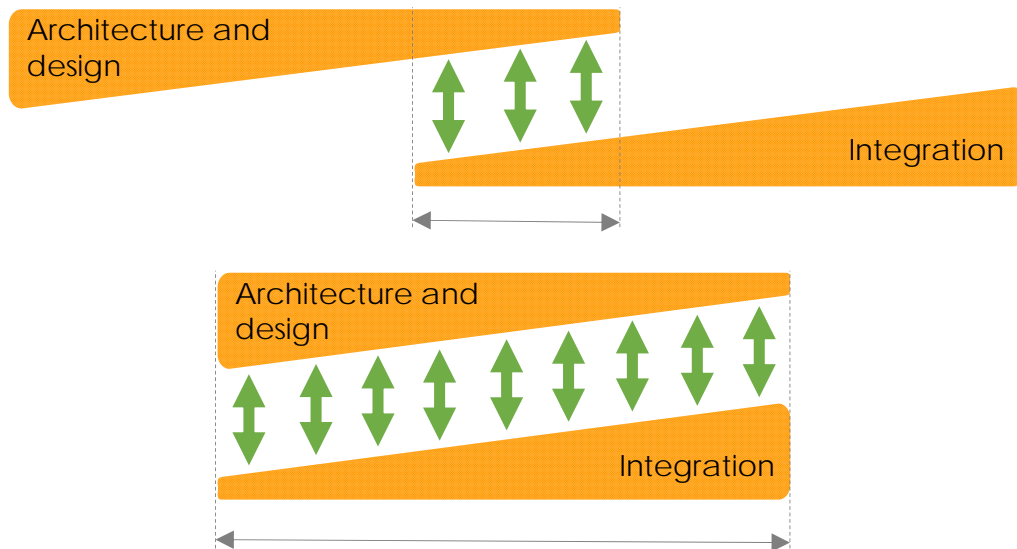


The waterfall approach



- Delimits the toolbox to essentially test based verification
- Prevents integration input on design

Using ideas behind the Vee



- Methods for integration can be shared with system architecture and design, e.g. simulation and analysis
- Systems integration can influence and challenge design

Summing up: Integration is like ice-cream...



...it comes in numerous flavors...

...so its essential to find the one mix and selection that works for you!

