Implementing an organizational capability for systems management – a model based approach

Tom Strandberg
Competence Area Manager Systems Engineering

Swedsoft
STEW 2016
Linköping
2016-10-12

Syntell | excellence in systems lifecycle management

Outline

- WHAT is happening and WHY is this important?
- WHAT can I do about it?
- HOW do I do it (and don´t do it)?
- WHAT will be the results?

excellence in systems
lifecycle management

Our business - INDUSTRY

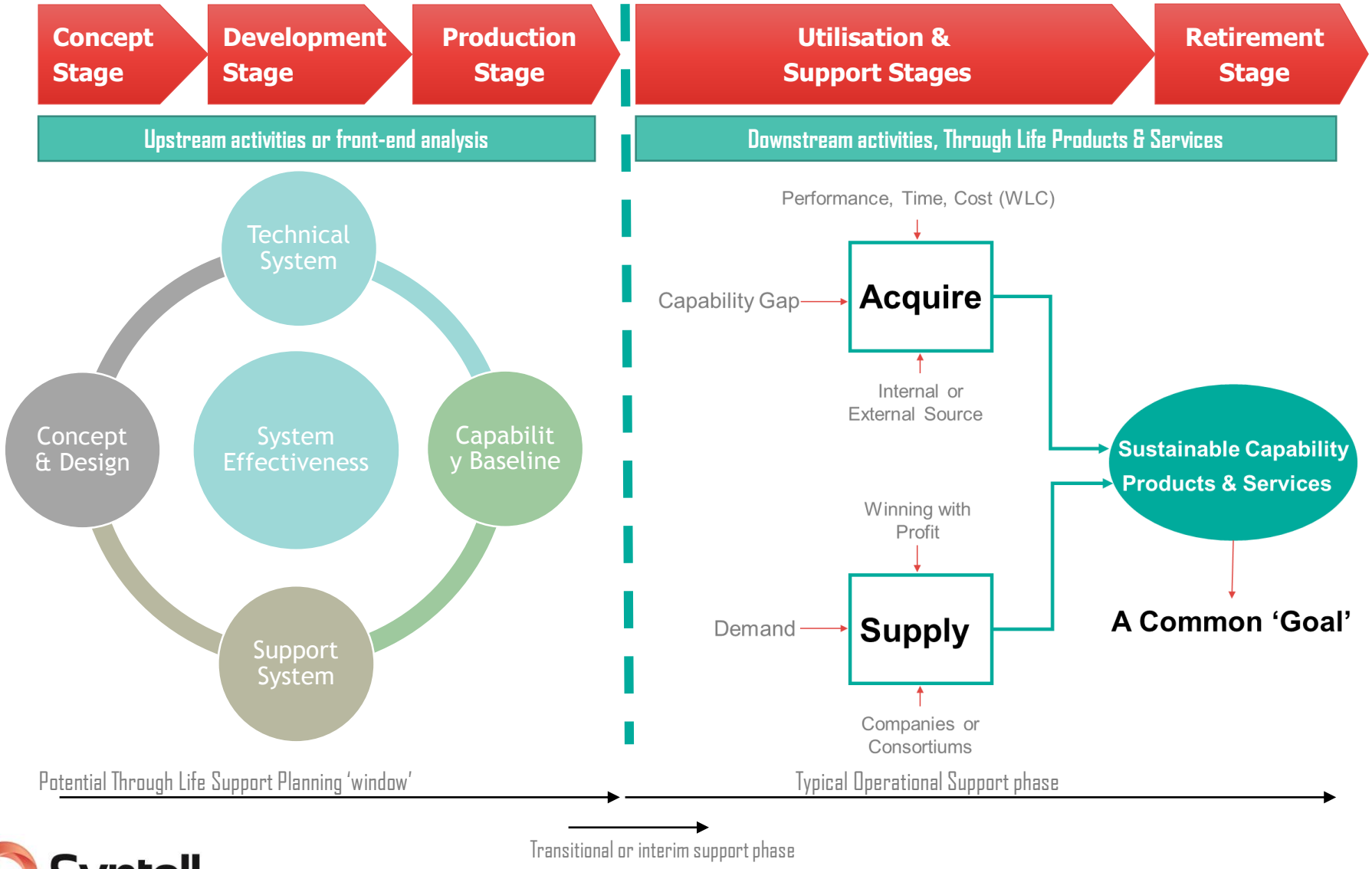
	Defence	Transport	Heavy Vehicles	MedTech	Other Industry
Strategy	■	■	■	■	
Business Development	■		■	■	■
Capability Development	■			■	
Project Support	■	■	■	■	■
Acquisition Support		■			
Bid Support	■		■		
Training Services	■	■	■	■	■

Syntell

OUR CLIENTS

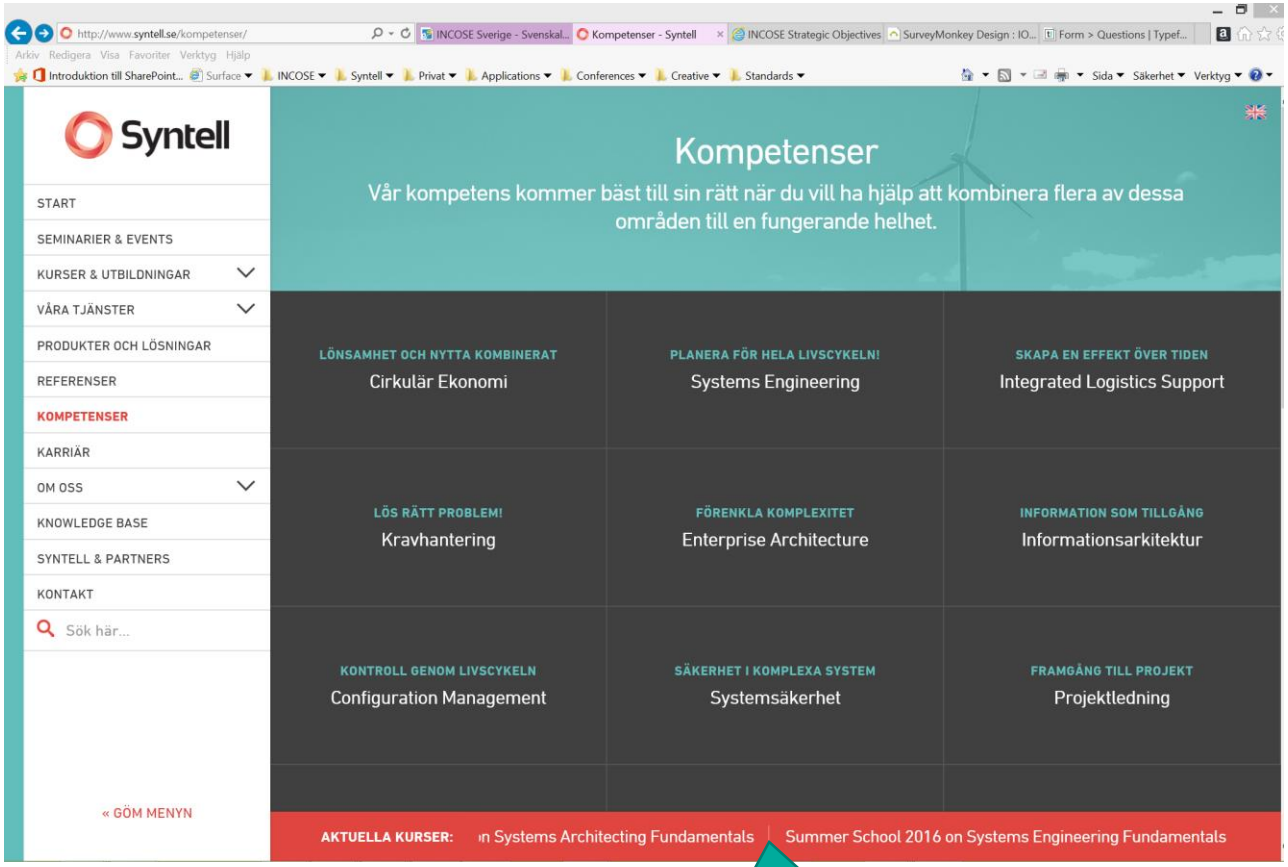
Stockholms läns landsting

SYSTEMS & LIFECYCLE PERSPECTIVE



Syntell

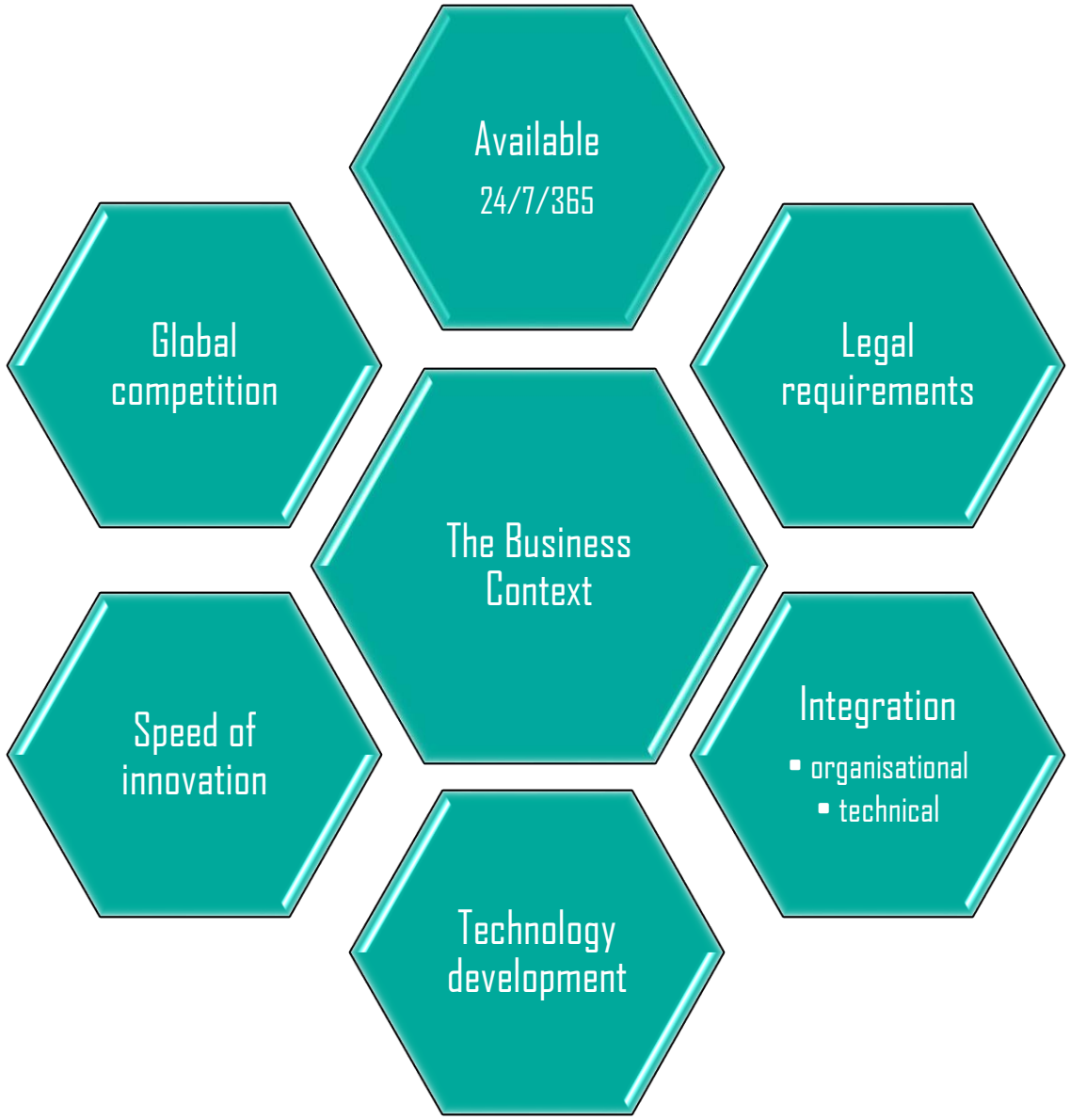
Competencies, www.Syntell.se



Summer School
A unique learning experience

WHAT is happening and WHY is this important?

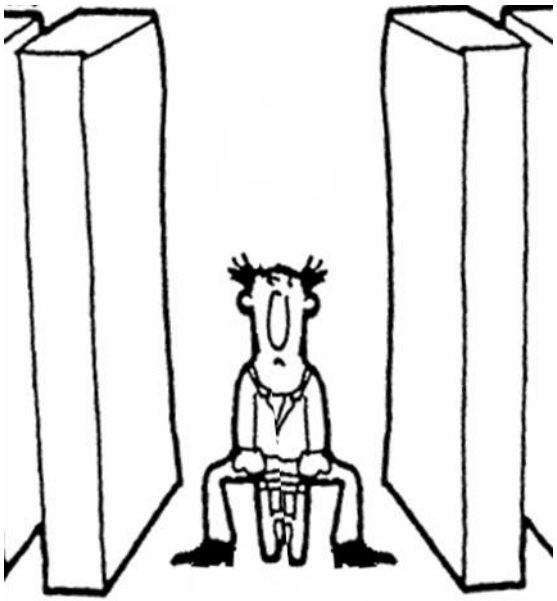
Market trends

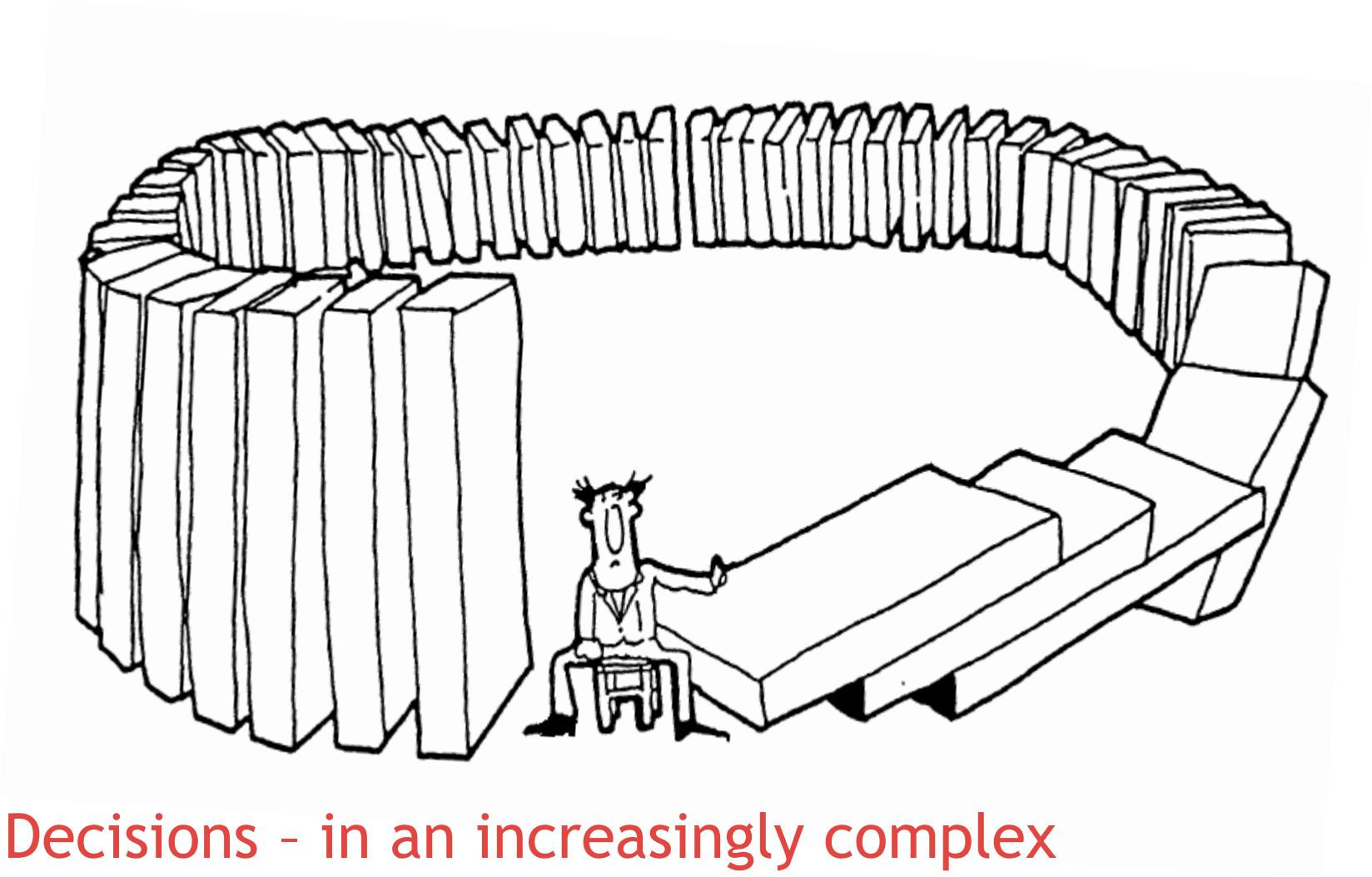


Syntell

Increasing pressure to …

Act!





Decisions – in an increasingly complex environment, the effect is difficult to predict

Syntell

What can You do about it?

Managing complex systems …

- Systems thinking
  - Understand the real problem
  - Understand the cause and effect
- Systems Engineering
  - Define a balanced solution to meet stakeholder´s needs and requirements
  - Establish traceability between need and solution
- Asset Management
  - Managing your physical assets over time to maximize benefits

Systems Thinking

Definition of a 'System'*:

- A system is a group of interacting, interrelated, and interdependent components that form a complex and unified whole

Systems have several defining characteristics*:

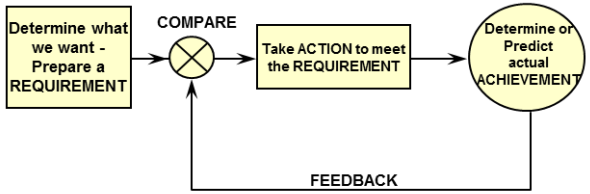
- Every system has a purpose within a larger system
- All of a system's parts must be present for the system to carry out its purpose optimally.
- A system's parts must be arranged in a specific way for the system to carry out its purpose.
- Systems change in response to feedback.
- Systems maintain their stability by making adjustments based on feedback.

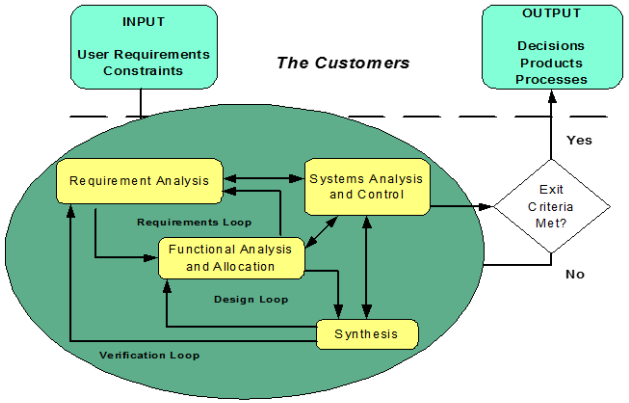
* Extracted from: https://thesystemsthinker.com/

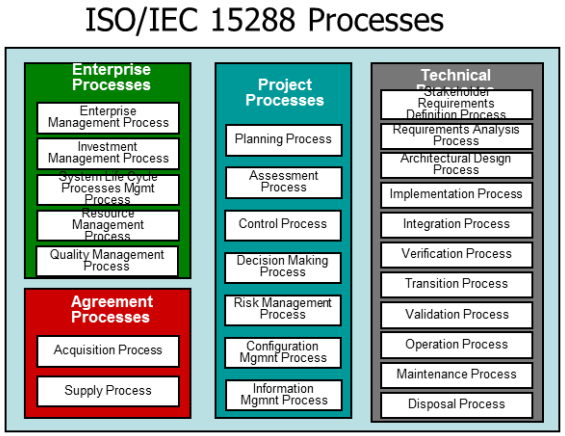
Systems Engineering

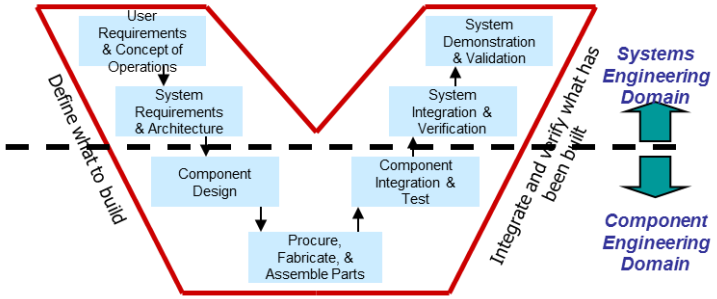
Interdisciplinary approach governing the total technical and managerial effort required to transform a set of customer needs, expectations, and constraints into a solution and to support that solution throughout its life.

(ISO/IEC/IEEE 2010)









Syntell

SE and ISO 15288 Key Concepts

Definitions

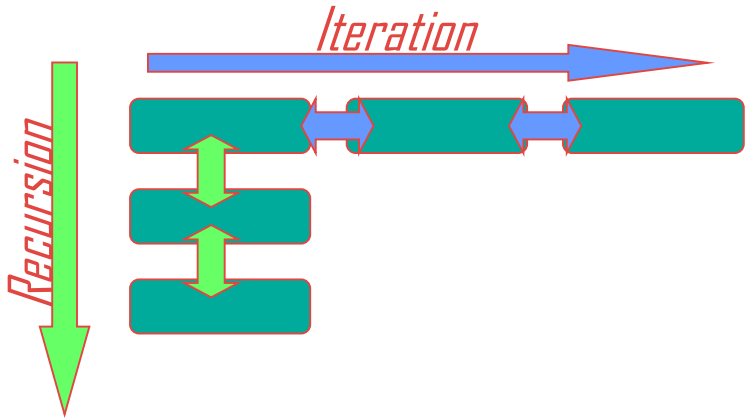
- Systems of Interest and Enabling Systems
- System and System element
- Systems comprise Hardware, Software and ”Humanware”, aka Cyber-Physical Systems (CPS) - 15288 puts SW in a system context

Building Blocks

- Processes (30 to be tailored)
- Life Cycle Model (sample stages illustrated in 2002 version)

Use

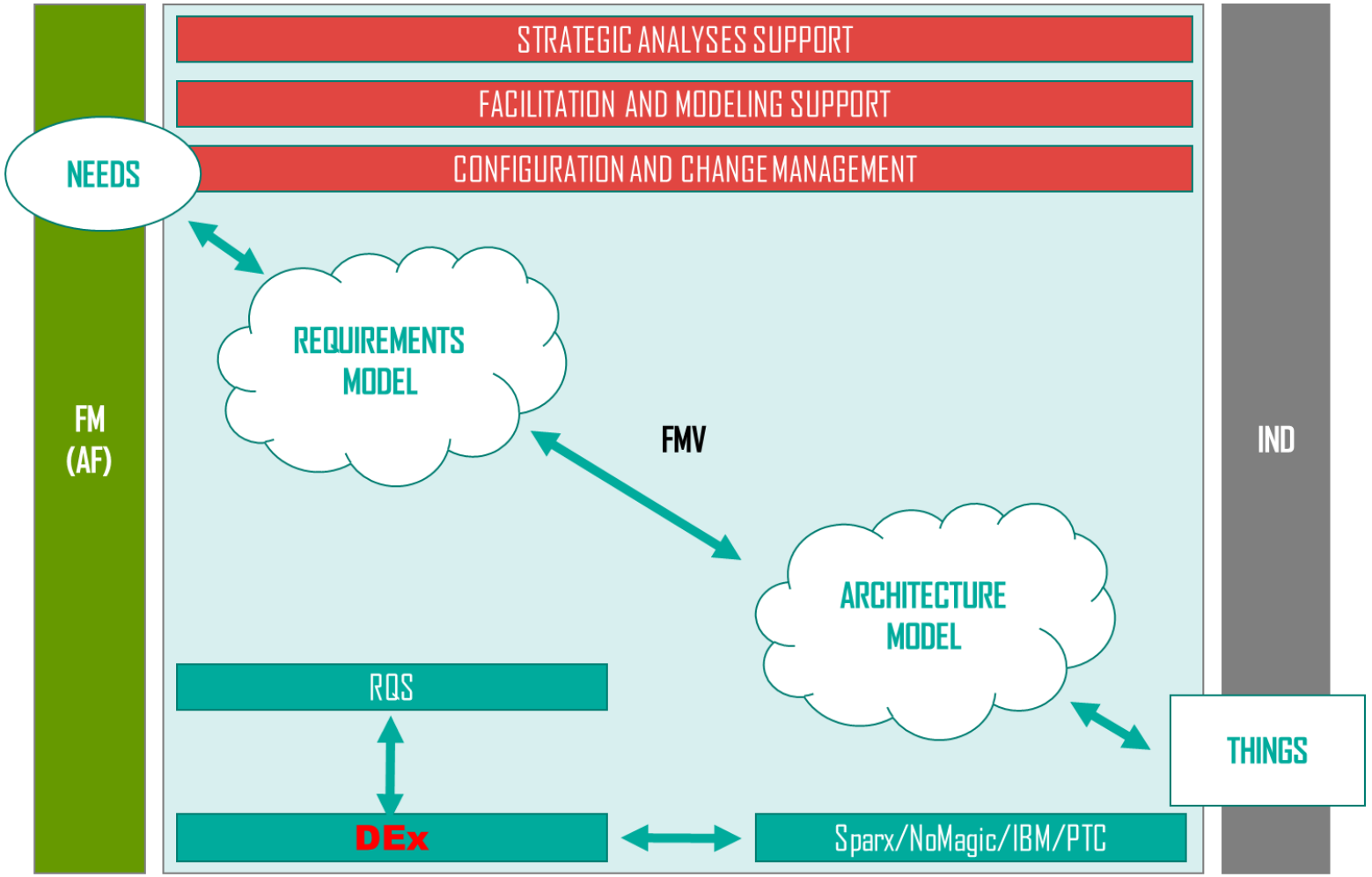
- Project Centric View
- Recursive Utilization
- Iterative Utilization



Syntell

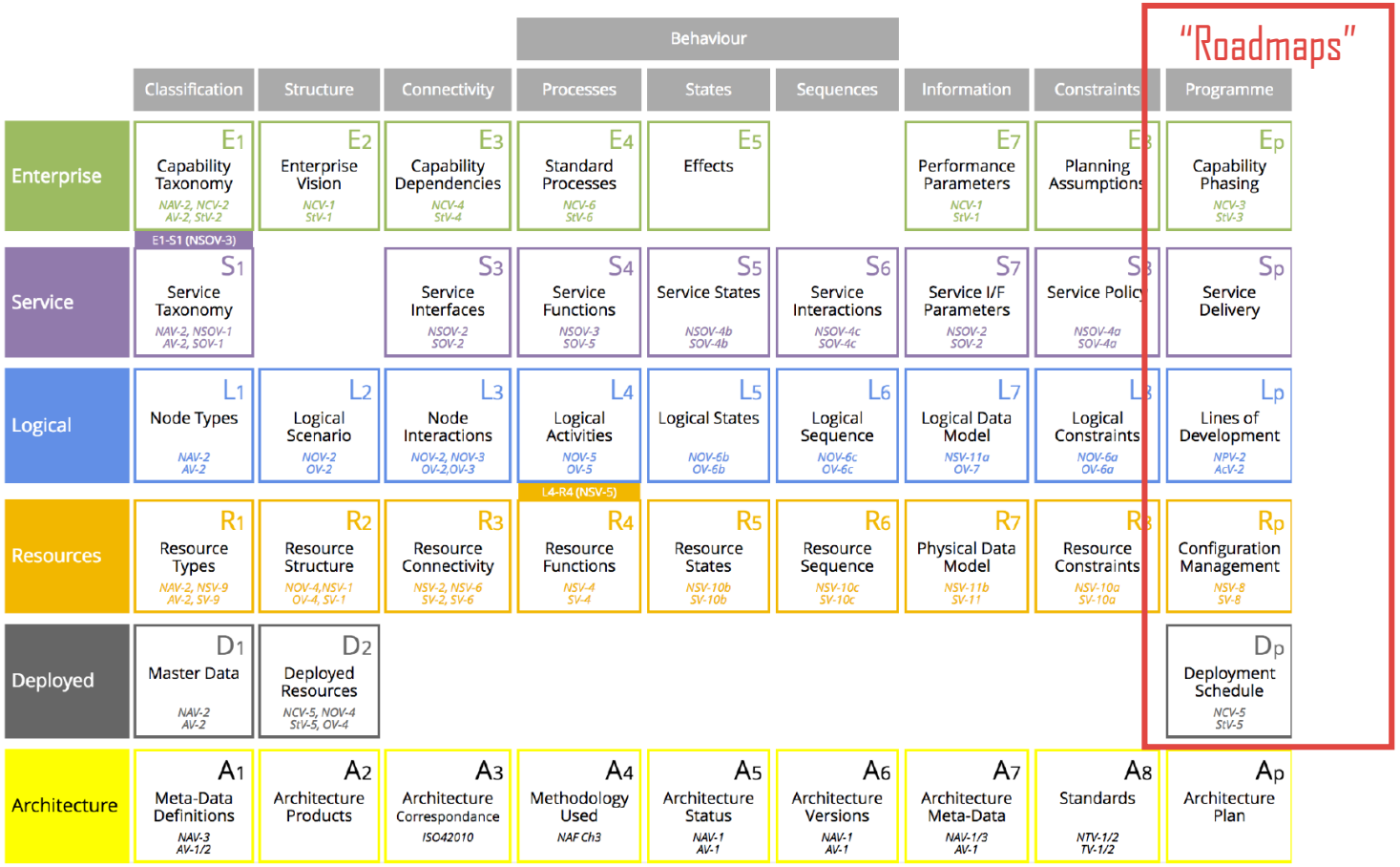
SE – establish traceability

- From Need to Solution

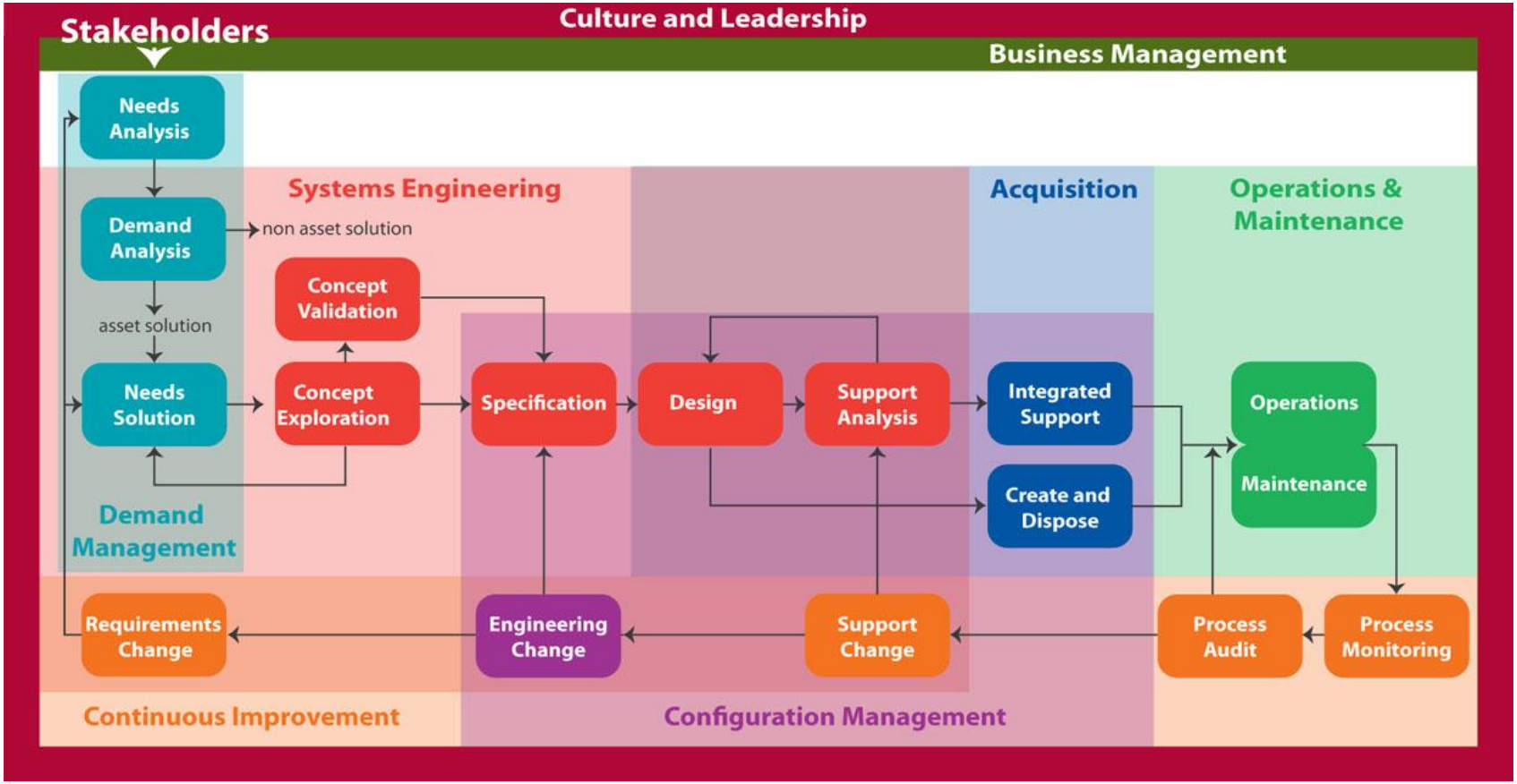


Architecture Framework NAF 4.0

- Grid approach (compare Zachmann / TOGAF)
- Provides "Roadmap" views



(Physical) Asset Management



Asset Management Council AM Framework
Reference to ISO 55000 and 15288

Syntell

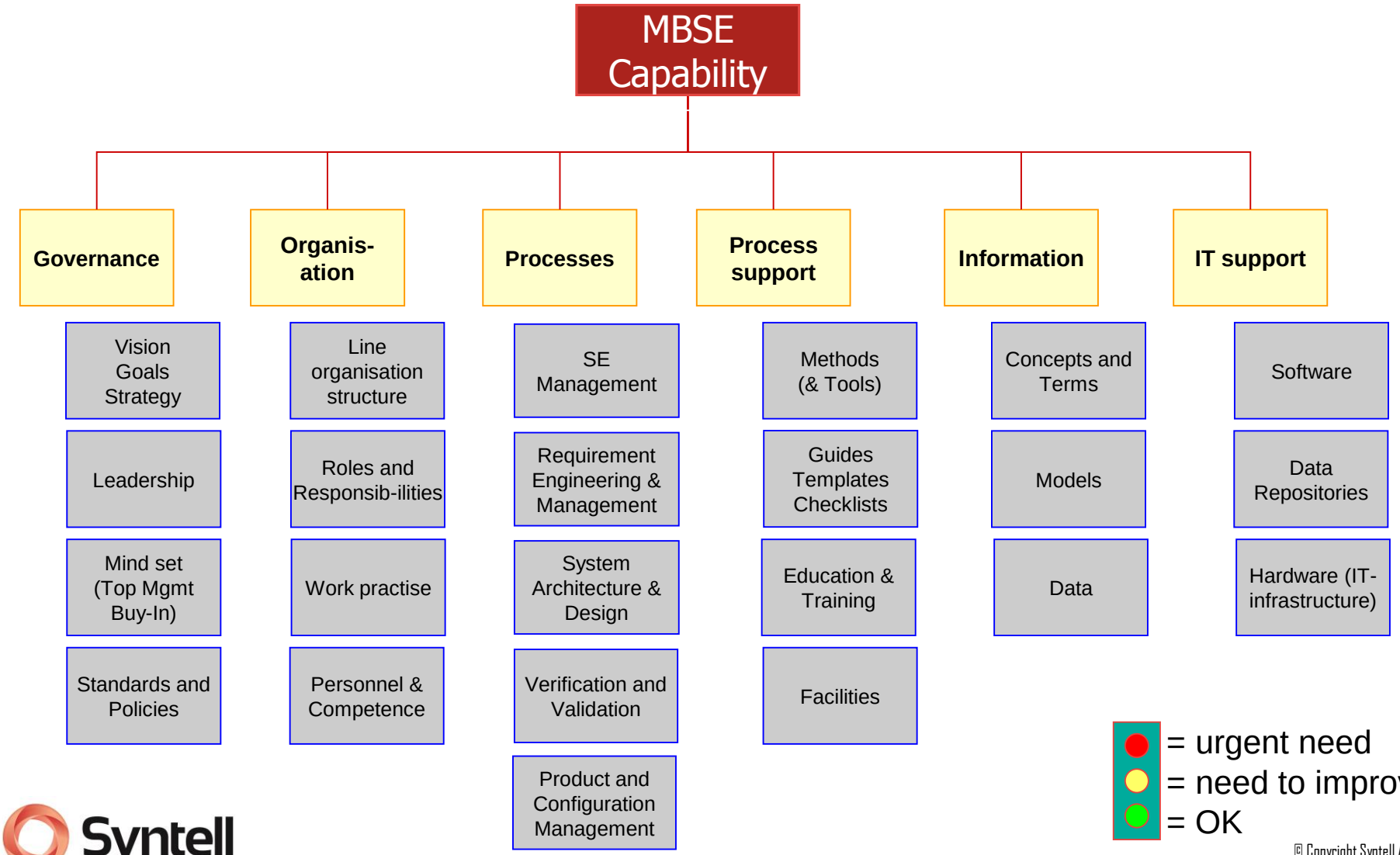
How do you do it?

Model-based SE

- Managing complex relationships requires simplification, i.e. modeling
- Coming of age
- Methods and tools exist
- Acceptance suffered from bad implementations
  - …. (numerous examples)
  - and to do MBSE, you need first to do SE!

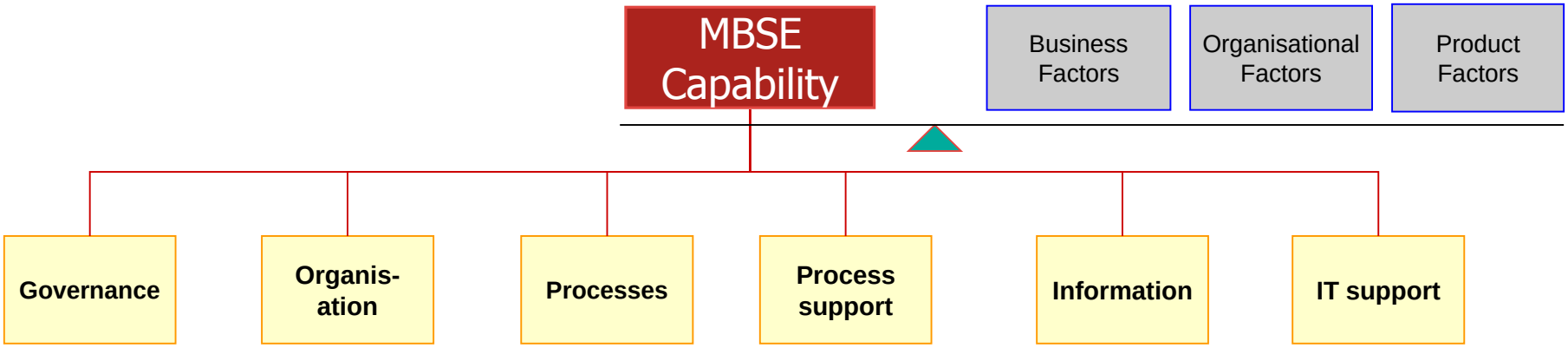
- Building a capability
  - Is more than a tool …

MBSE Capability Model



Syntell

Balancing the Capability with Business Needs and Situation



Syntell

Need → Run the business → Effect

Run the business

MBSE Capability

Business Factors | Organisational Factors | Product Factors

Governance

Mind-set: Stöd i att definiera en tydlig målbild i form av vilka modeller som tas fram för att möta behov

Visioner och Mål: Stötta argumentation och samarbete med Projekt X och Model-Based Dev.

Organis-ation

Roller & Ansvar: Löpande me… för kvalitets… modellen

Roller & Ansv… Definiera nöd… roller och regl… ägandeskap av… modellen.

Personal&Kom… : Definiera rolle… och lämplig kompetensnivå

Personal & Kompetens: Utbi… de olika rollerna … extra kurser utan… detta kontrakt

Processes

Process support

…ning, mallar …cklistor: …på valda …er och …av, ta fram …r och mallar …ing

Verktyg: …g och val …rktyg

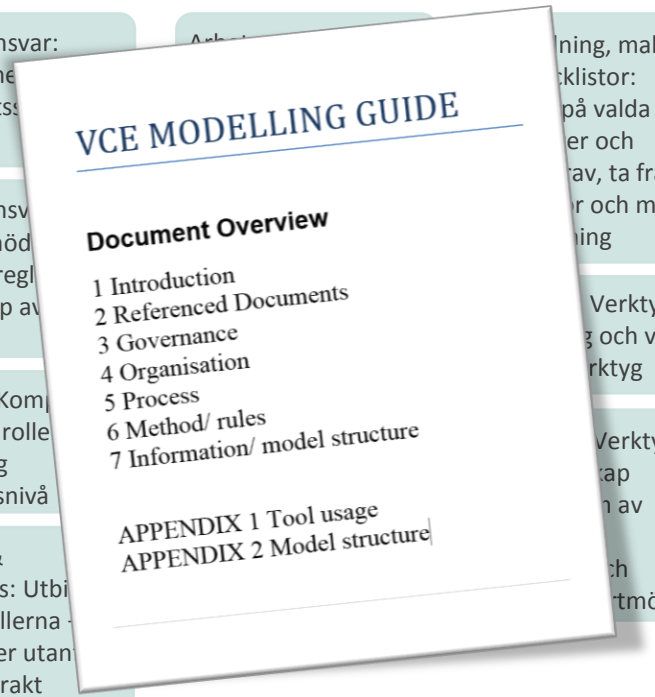
Verktyg: …tap …n av …ch …rtmöten

Information

Begrepp & termer: Sammanställ existerande terminologi, synka med gängse etablerad terminologi

IT support

IT-stöd: Leda upplägg för konfigurations-ledning av modellen


VCE MODELLING GUIDE

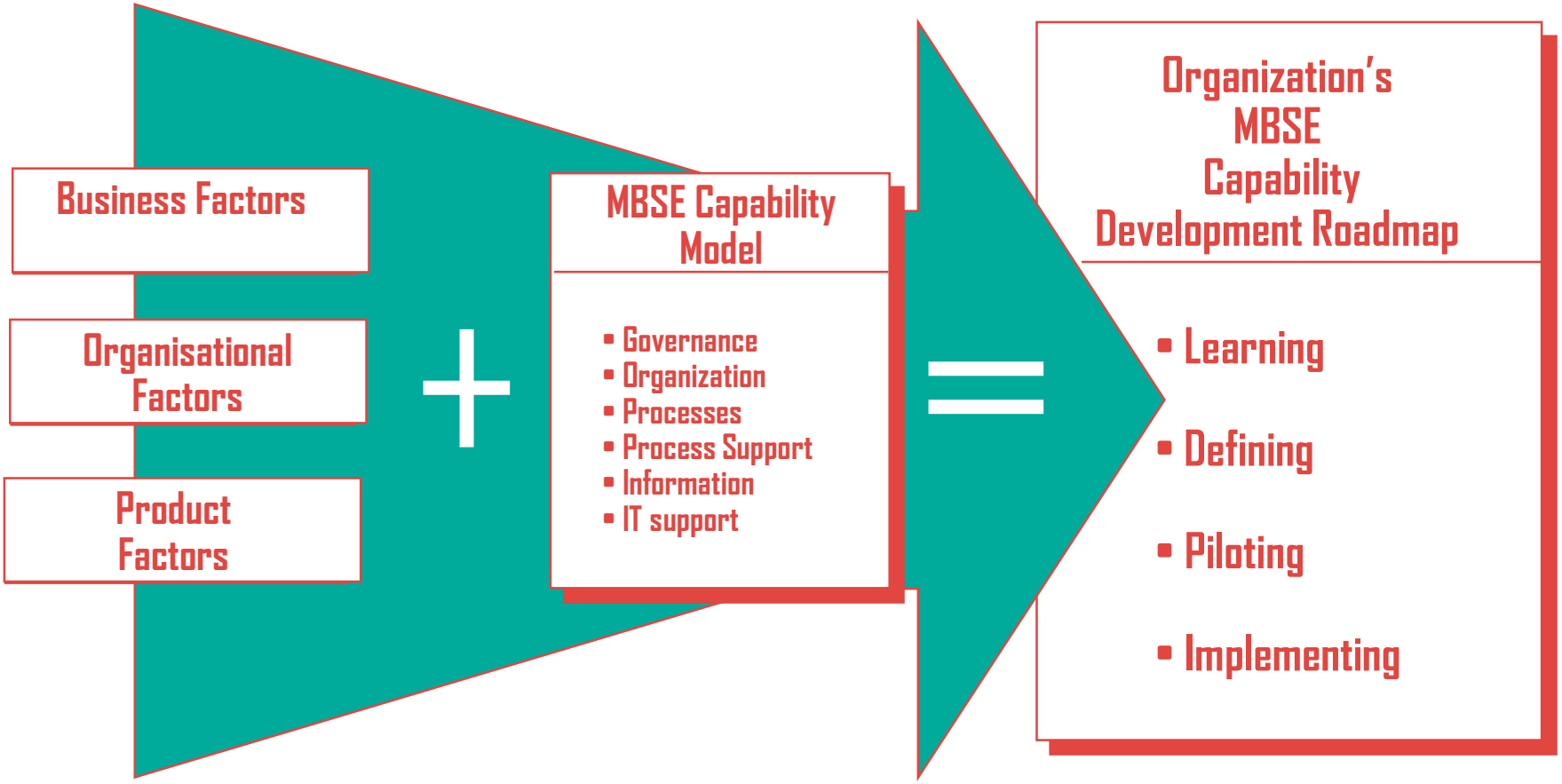
Document Overview

1 Introduction
2 Referenced Documents
3 Governance
4 Organisation
5 Process
6 Method/ rules
7 Information/ model structure

APPENDIX 1 Tool usage
APPENDIX 2 Model structure

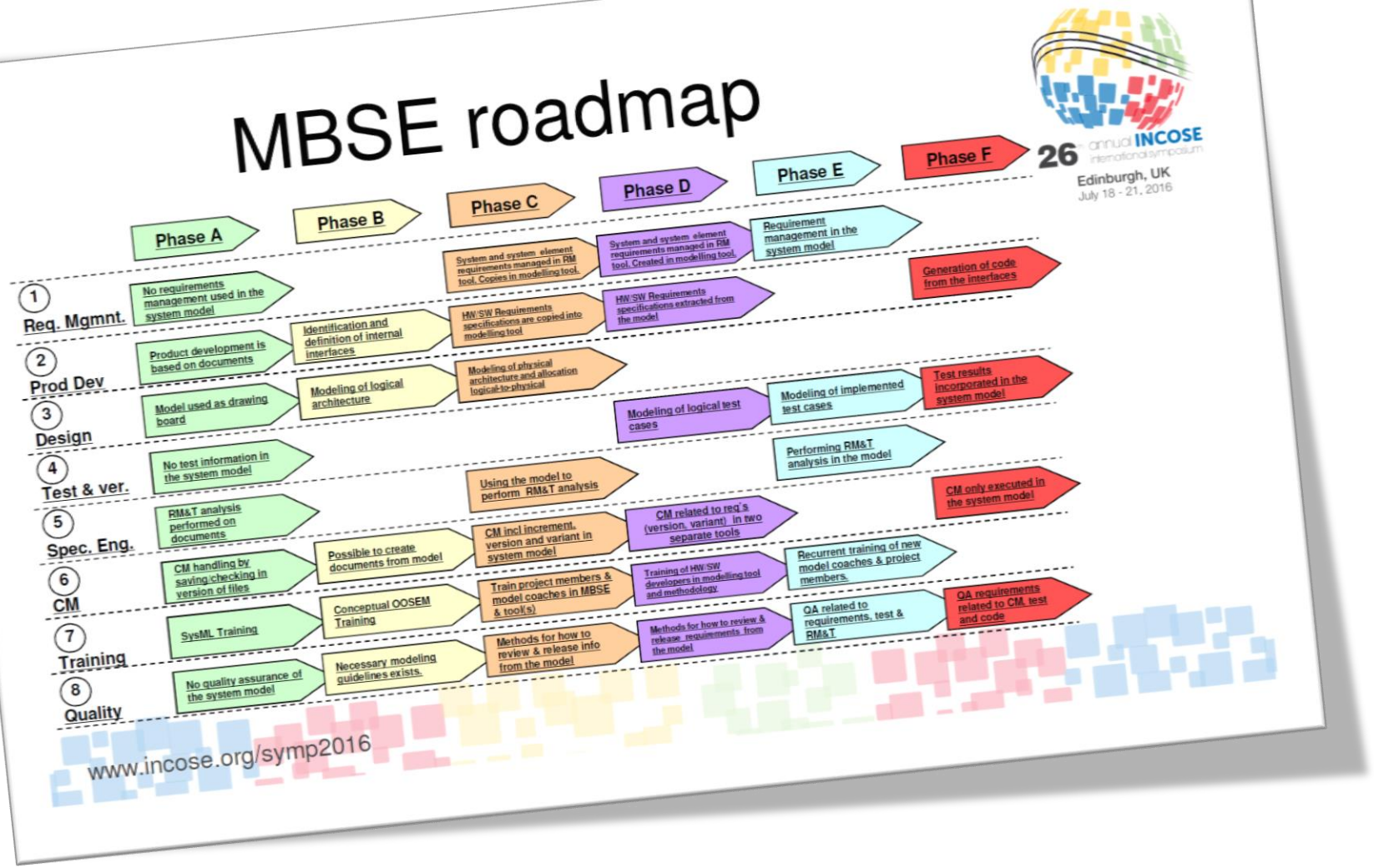
Syntell

Capability Tailoring Concepts



Syntell

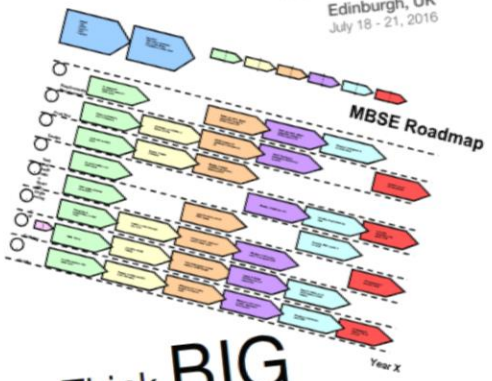
MBSE roadmap



Syntell

Key issues

- No one succeed with a large and fast introduction of MBSE for complex product development
- All organizations report the need for a careful and well planned change
  - ✓ Identify the need and what problem that is expected to be solved by working with models
  - ✓ Plan the transition into MBSE careful
  - ✓ Perform small steps and evaluate
  - ✓ And always remember the original need and problem
- Provide time to develop methods in sync with introduced change
- Provide time to increase competence base in sync with introduced change



Think BIG
Start Small
and EVOLVE

www.incose.org/symp2016

What You will win

Improved business and systems mgmt

An improved map to navigate your business from:

- identify impact of change in your market on your system
- define the market mix of services and products
- understand impact of introducing new technology
- Streamline your assets portfolio

Syntell

Prepared for change

Complexity turned into competitive advantage!

Questions?

Tom.Strandberg@syntell.se

Syntell

excellence in systems lifecycle management