

# Practical experience of adopting and using 15288 in small and large companies from different areas

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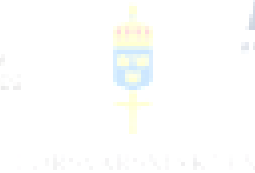
BOMBARDIER



NOKIA



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# Application modes of ISO/IEC/IEEE 15288

By an organization

to establish an environment of desired processes that can be supported by an infrastructure of methods, procedures, techniques, tools and trained personnel.

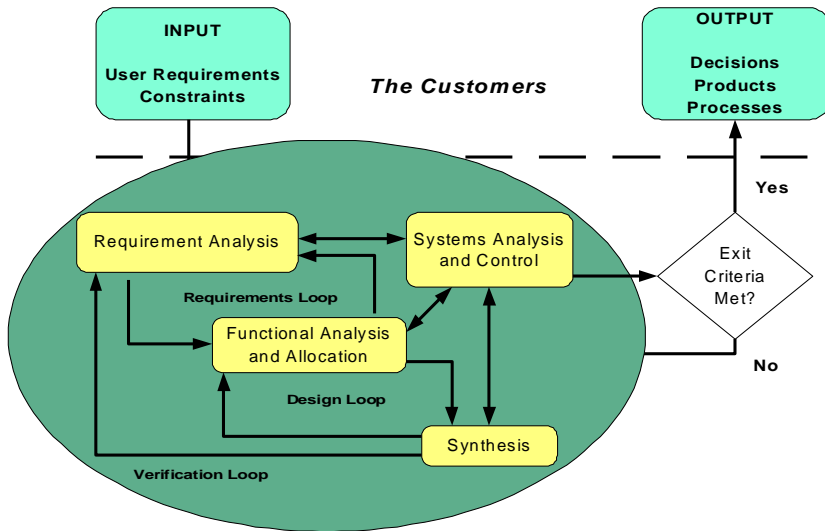
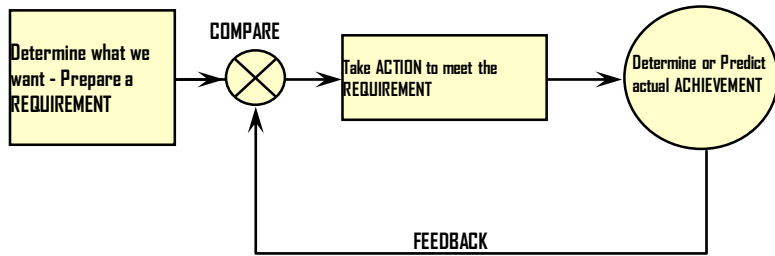
By a project, within an organization

to select, structure, employ and perform the elements of the established environment to provide products and services.

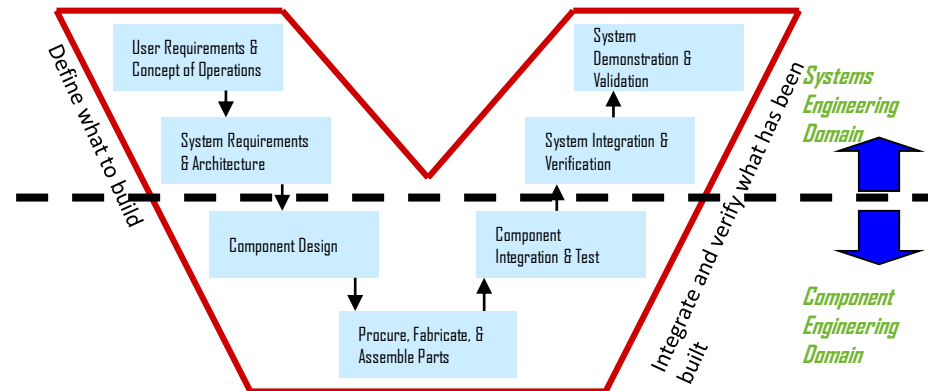
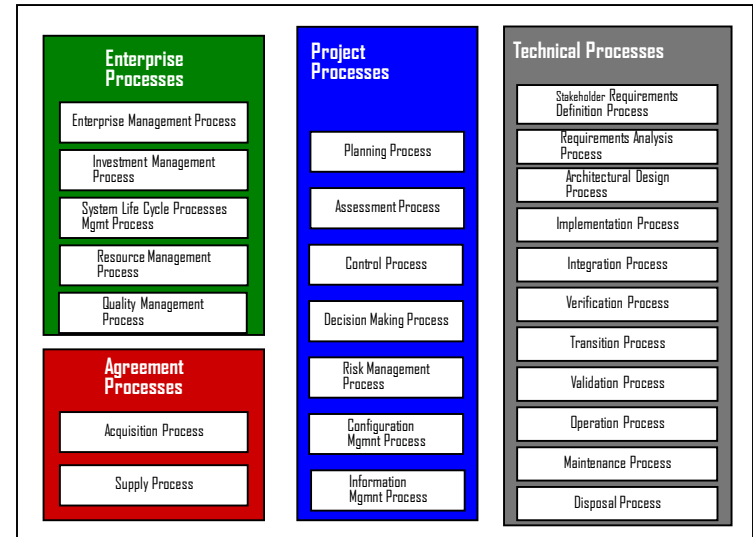
By an acquirer and a supplier, via an agreement

to select, agree on and perform the processes and activities in this International Standard.

# The changing scope of SE - from development to system life cycle



## ISO/IEC 15288 Processes



# ISO 15288 Key Concepts

## Definitions

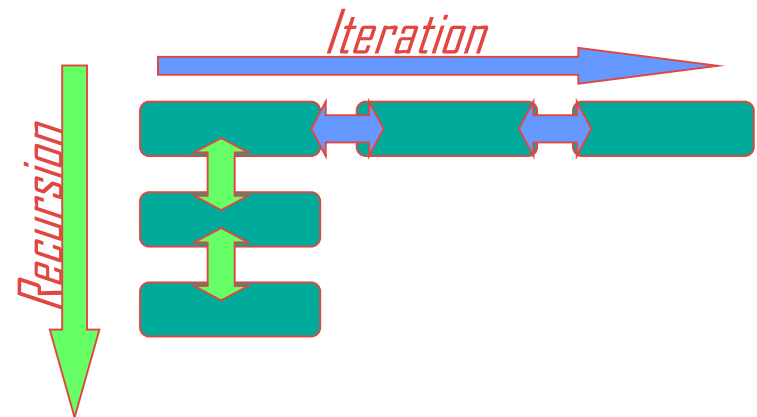
- Systems of Interest and Enabling Systems
- System and System element

## Building Blocks

- Life Cycle Model (sample stages illustrated in 2002 version)
- Life cycle Processes (25 in four categories)
- The 26th process – Tailoring process (Normative!)

## Views

- Project Centric View
- Recursive Utilization
- Iterative Utilization



# Case - Organisational Development in SME Company

2001

# Current situation

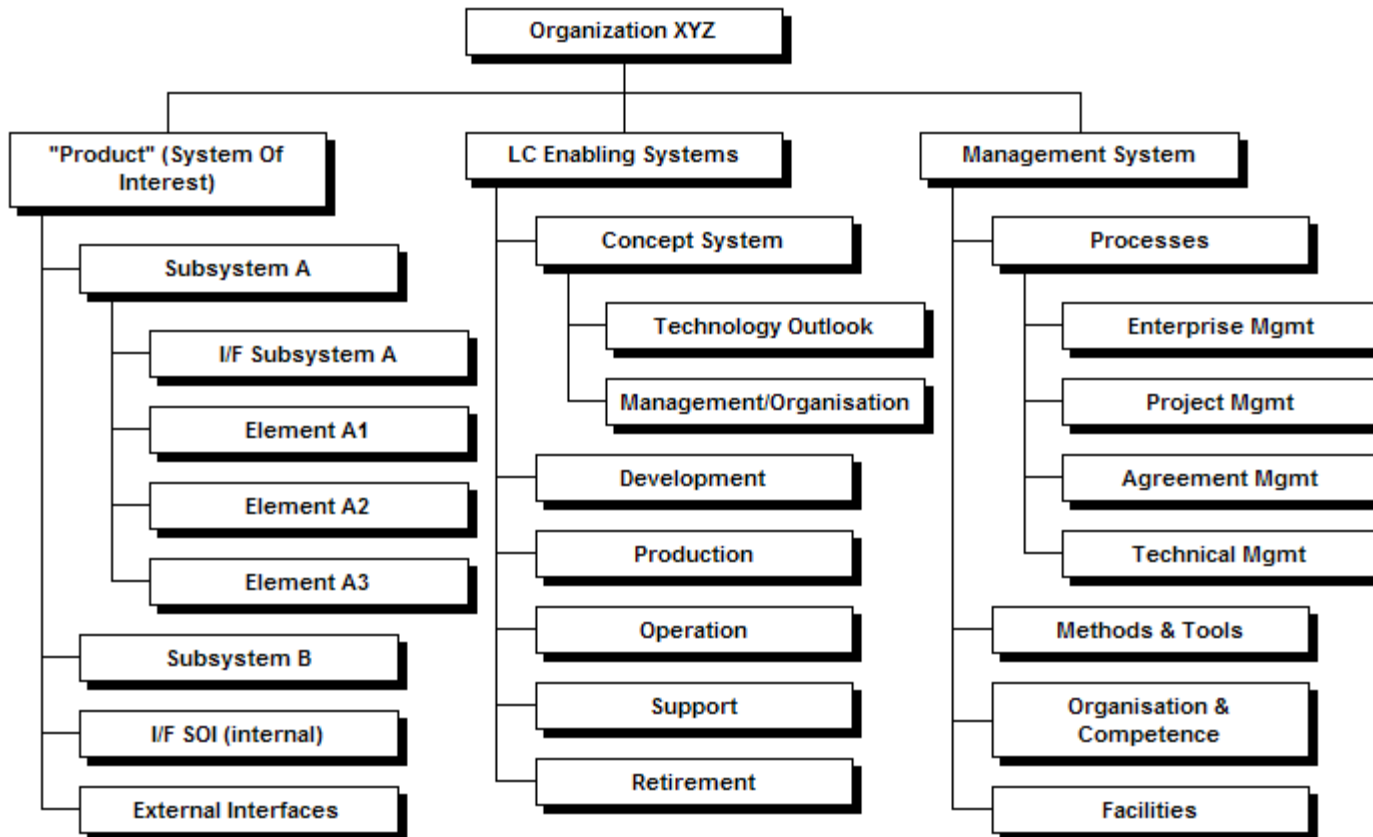
- Multi-national, manufacturing company
- Supplier of a nisch-product in a rather small limited market
- necessary to keep abreast of competition, by continuous improvement in product and services
- Challenges:
  - **Low profitability/margins**
  - **High frequencies of ECP´ s after final delivery**
  - **Customer satisfaction**
- Cause:
  - **System/technical related**
  - **Organisation/project related/process related**
  - **Profit/cost related**
  - **Contract/customer related**

# Pre-study Description

- Objective:
  - To establish a foundation for the implementation of improved business processes
- Goals:
  - Define the underlying problems
  - Define the prioritised processes and activities
  - For the prioritised processes, identify the checklists/documents to be used by project staff
  - Prepare a strategy for implementation of the prioritised processes
  - Prepare presentation for Top Management
- Considerations:
  - The proposed processes and activities shall concur with the existing Company Processes (as far as possible)



# System and Interface Definition



# Problem identification and prioritisation structured according to ISO/IEC 15288 processes

	System Life Cycle Processes	How well?	How important?	Improvement Potential?	Priority
		Scale 1-5	Scale 1-5	Scale 1-5	1,2,3
<b>AGR</b>	<u>Agreement Processes</u>				
AGR01	Acquisition Process				
AGR02	Supply Process				
<b>ENT</b>	<u>Enterprise Processes</u>				
<b>PRO</b>	<u>Project Management Processes</u>				
<b>TEC</b>	<u>Technical Processes</u>				
TEC01	<u>Stakeholder Requirements Definition Process</u>				2
	Bristande milökunskap-kunskap om intressenterna	4	4	3	
	Bristfällig kravanalys	2	5	5	2
	Bristfällig specificering	2	4	4	3
TEC02	<u>Requirements Analysis Process</u>				2
TEC03	<u>Architectural Design Process</u>				
TEC04	<u>Implementation Process</u>				
TEC05	<u>Integration Process</u>				3
TEC06	<u>Verification Process</u>				1
TEC07	<u>Transition Process</u>				
TEC08	<u>Validation Process</u>				1
TEC09	<u>Operation Process</u>				
TEC10	<u>Maintenance Process</u>				
TEC11	<u>Disposal Process</u>				

# Definition and prioritisation of deliverables for prioritised processes

	Number of Prioritised Output Docs	1	56			
		2	23			
		3	4			
System Life Cycle Processes		Priority	Output Document Checklist	Yes	No	Comments
<a href="#">ENT</a>	Enterprise processes					
<a href="#">AGR</a>	Agreement processes					
<a href="#">PRO</a>	Project processes					
<a href="#">TEC</a>	Technical processes					
<a href="#">TEC01</a>	Stakeholder needs definition process					
		2	Stakeholder identification and classification			
		2	Stakeholder requirement definition			
		2	Operational profiles			
			Operations concept document			
		1	Lessons learned report			
<a href="#">TEC02</a>	Requirements analysis process					
<a href="#">TEC03</a>	Architectural design process					
<a href="#">TEC04</a>	Implementation process					
<a href="#">TEC05</a>	Integration process					
<a href="#">TEC06</a>	Verification and validation process					
<a href="#">TEC07</a>	Transition process					
<a href="#">TEC09</a>	Operation process					
<a href="#">TEC10</a>	Maintenance process					
<a href="#">TEC11</a>	Disposal process					

# Proposed Strategy

- Utilise a Project as Pilot to establish:
  - product/system development process
  - system/product and interface definition
  - system life-cycle definition
  - project definition
  - applicable processes and checklists
  - trial in a supplier-acquirer context
  - assessment, control and evaluation of results and processes
- In parallel, work at the organisational level to:
  - appoint Champion and allocate key persons
  - create a Business Process Improvement organisation and allocate responsibilities
  - develop tailored process descriptions and checklists (include experiences from the Pilot)
  - develop training material
  - conduct training according to implementation strategy (process areas, geographical areas, business units, etc.)

# Case - Use in Agreement by Large organisation

2002

# The Challenge and Solution

## ■ Challenge

- Win customers confidence in a dispute in regarding how SE should be implemented in a large international project

## ■ Resultat

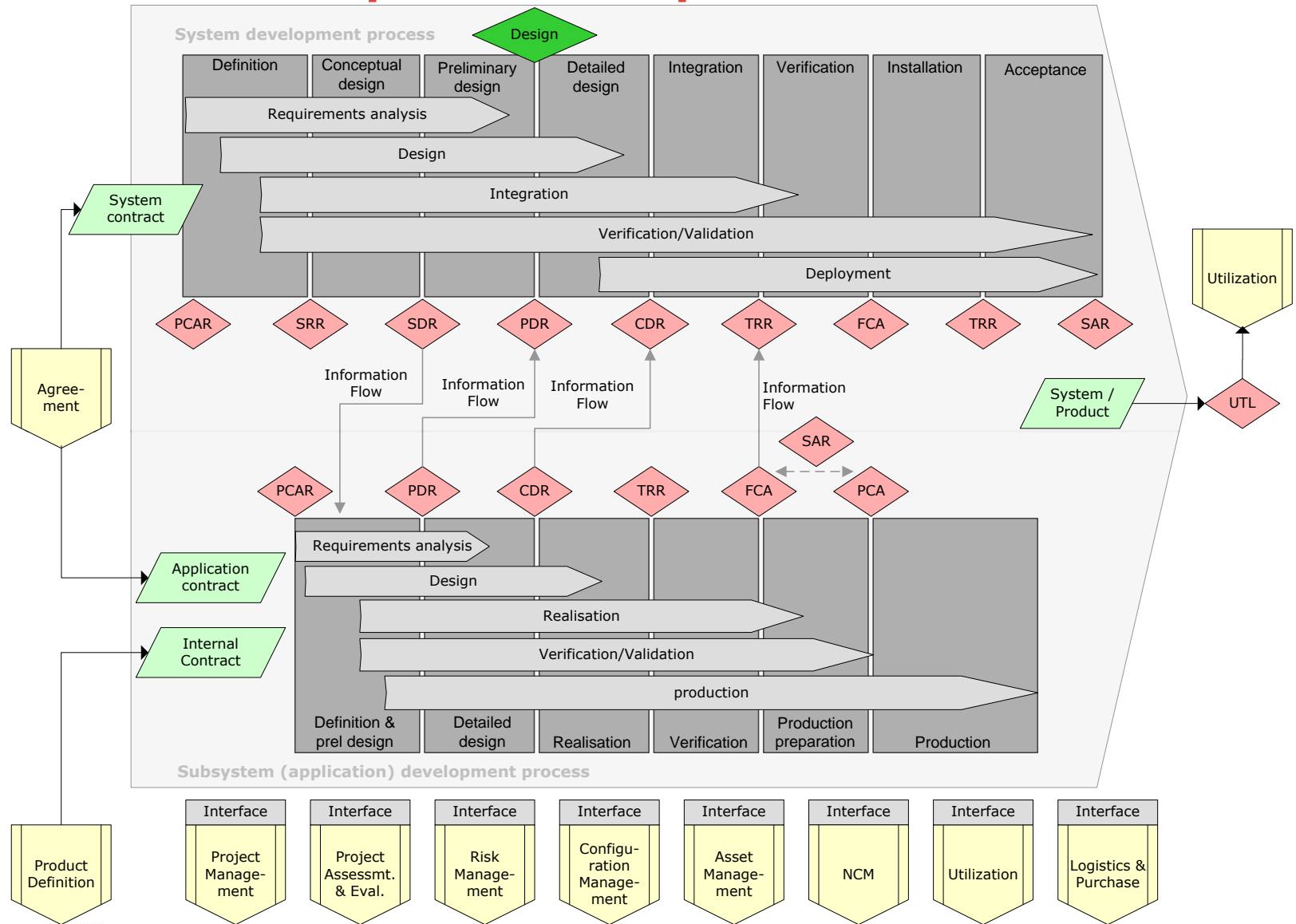
- Customer and supplier in agreement and project was delivered satisfactorily

## ■ Success Criteria

- Syntells competence in interpretations and tailoring of SE methodology based on international standards, ISO/IEC 15288
- Understanding of both economical and technical aspects



# Process map developed



# Case - Contract use in Large organisation

2008



# SEMP à la 15288

## Systems Engineering Management Plan

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# Concurrent process use over System Life Cycle

(sample from infrastructure project)

15288 Technical Process

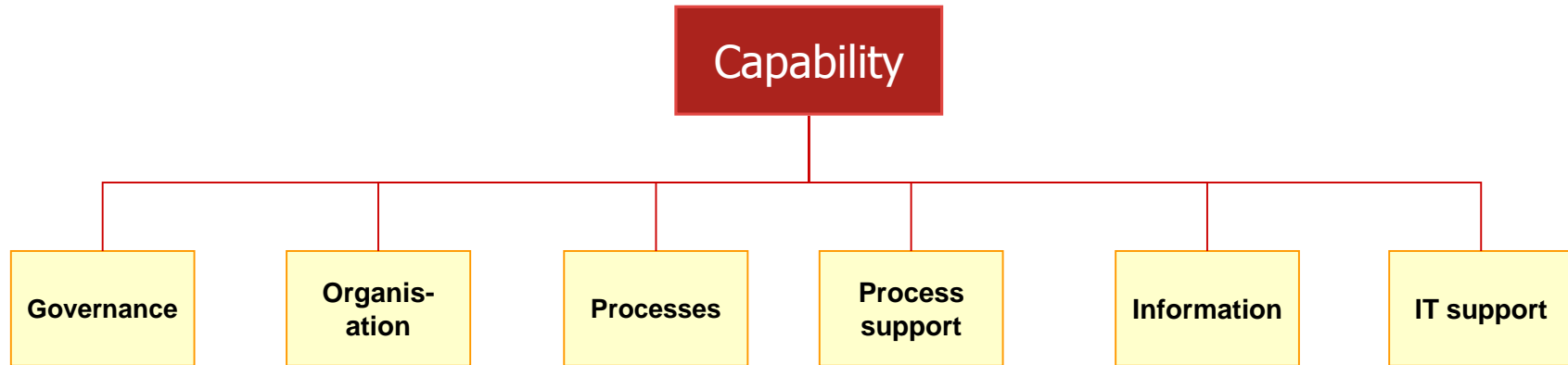
	Conceptual design stage	Basic design stage	Detailed design stage	Manufacturing stage	Installation, Testing Stage	Product Delivery Stage	Operation Stage	Warranty & Support Stage	Retirement Stage
Stakeholder Requirements Definition Process	Define additional stakeholders	Manage stakeholder requirements	Manage stakeholder requirements	Manage stakeholder requirements	Manage stakeholder requirements	Manage stakeholder requirements	Manage stakeholder requirements	Manage stakeholder requirements	Draw lessons learned
Requirements Analysis Process	Review Requirements	Analyse system requirements	Analyse requirements impact	Analyse requirements impact	Analyse requirements impact	Analyse requirements impact	Analyse requirements impact	Analyse requirements impact	Draw lessons learned
Architectural Design Process	Define external interfaces	Architect system-level, interfaces	Architect system elements	Manage system architecture	Manage system architecture	Manage system architecture	Manage system architecture	Manage system architecture	Draw lessons learned
Implementation Process	Define Implementation strategy	Support Make/Buy decisions	Establish implementation capability	Manufacture/Build System	Rebuild as necessary	Rebuild as necessary	Rebuild as necessary	Rebuild as necessary	Recover useful parts
Integration Process	Define Integration strategy	Define Integration Plan	Define Integration schedule	Mobilize for integration	Integrate system	Integrate new parts	Integrate new parts	Integrate new parts	Support disintegration
Verification Process	Define Verification strategy	Verify basic design	Verify detailed design	Prepare for system verification	Verify system	Verify modifications	Verify modifications	Verify modifications	Draw lessons learned
Transition Process	Define Delivery strategy	Define Delivery Plan	Define Delivery Schedule	Prepare for delivery	Deliver system	Deliver system	Deliver new system versions	Deliver new system versions	Retrieve valid parts
Validation Process	Define Validation criteria	Define validation strategy	Define validation plan	Define validation schedule	Mobilize for validation	Validate system	Validate new system versions	Validate new system versions	Validate complete disposal
Operation Process	Define Operational scenarios	Define use cases	Define operational procedures	Develop operational manuals	Operate "first-offs"	Prepare for operations	Operate system	Revise operations as necessary	Retire operation
Maintenance Process	Define Maintenance Concept	Define support trade-offs	Define support system	Manufacture support items	Maintain "first-offs"	Mobilize support resources	Diagnose system	Support System	Retire support system
Disposal Process	Define Disposal concept	Influence system disposability	Define Disposal Strategy	Define Disposal Plan	Define Disposal Schedule	Mobilize disposal resources	Ensure disposability maintained	Review system ready for disposal	Dispose system



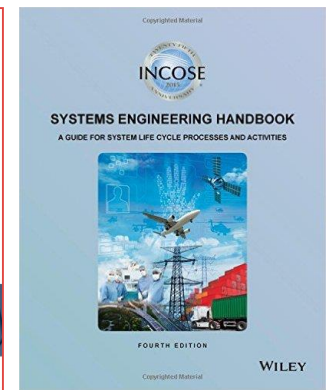
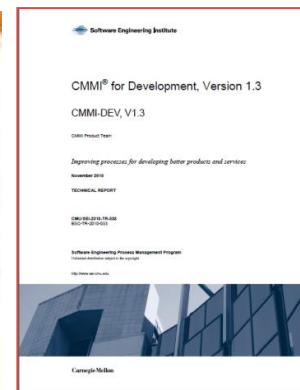
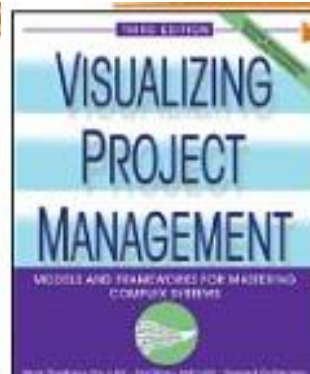
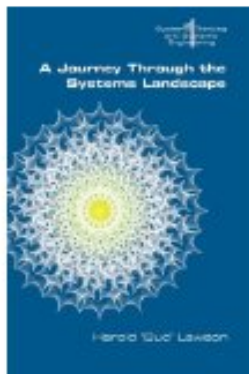
# Case - Organizational Development in SME Company

2015

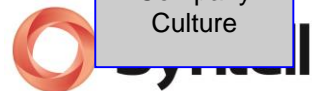
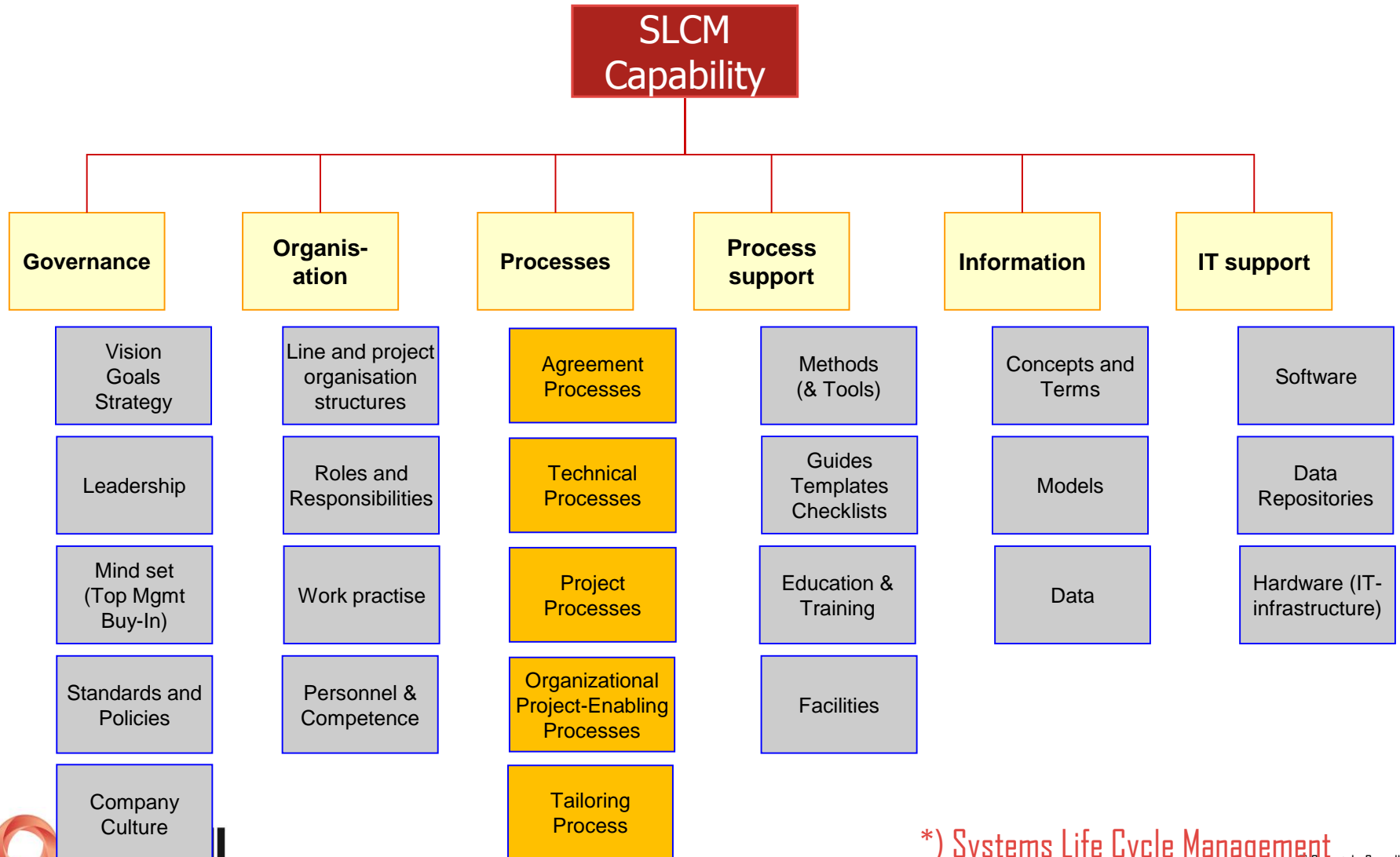
# Syntell Capability Model



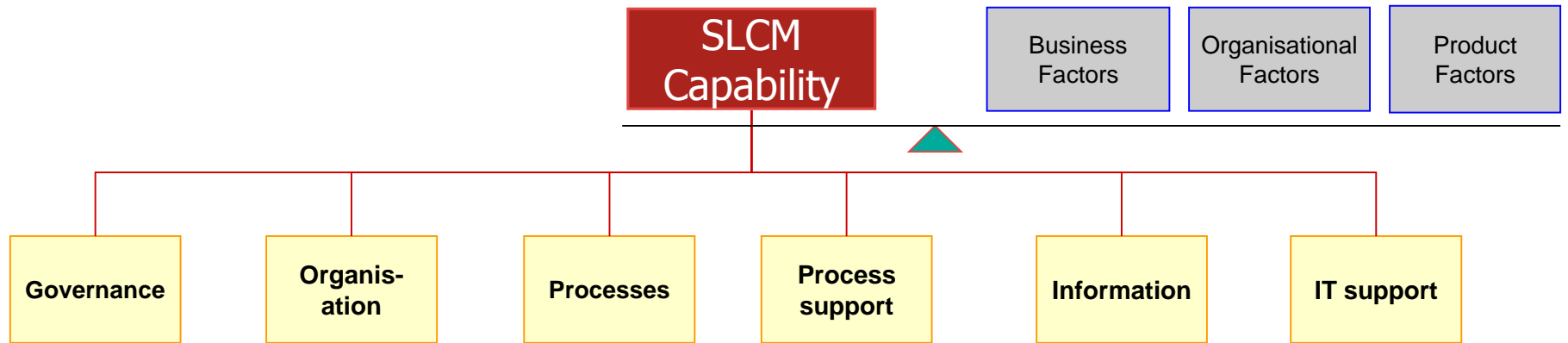
Based on our experience and world best practice.



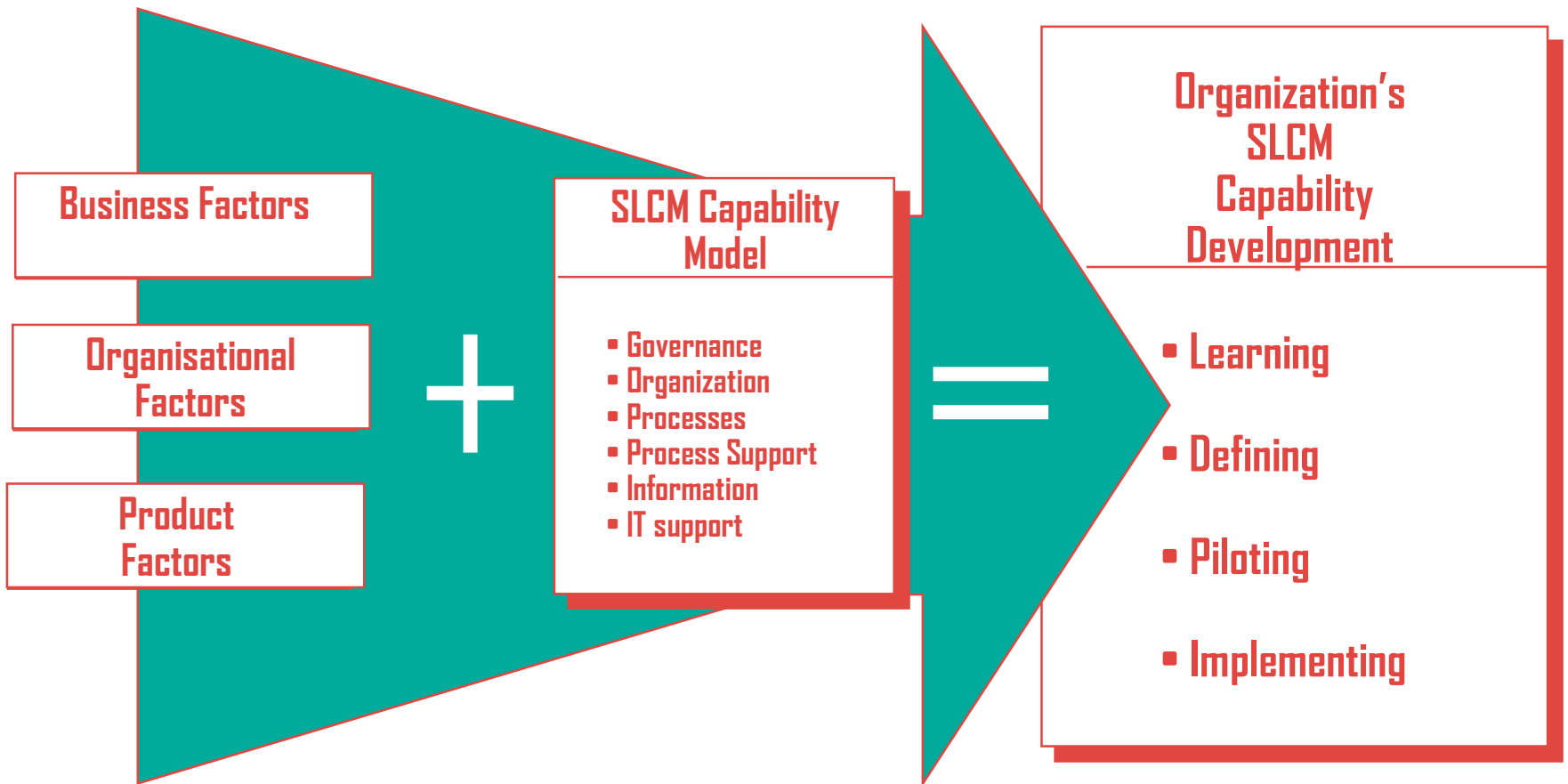
# SLCM\* Capability Model



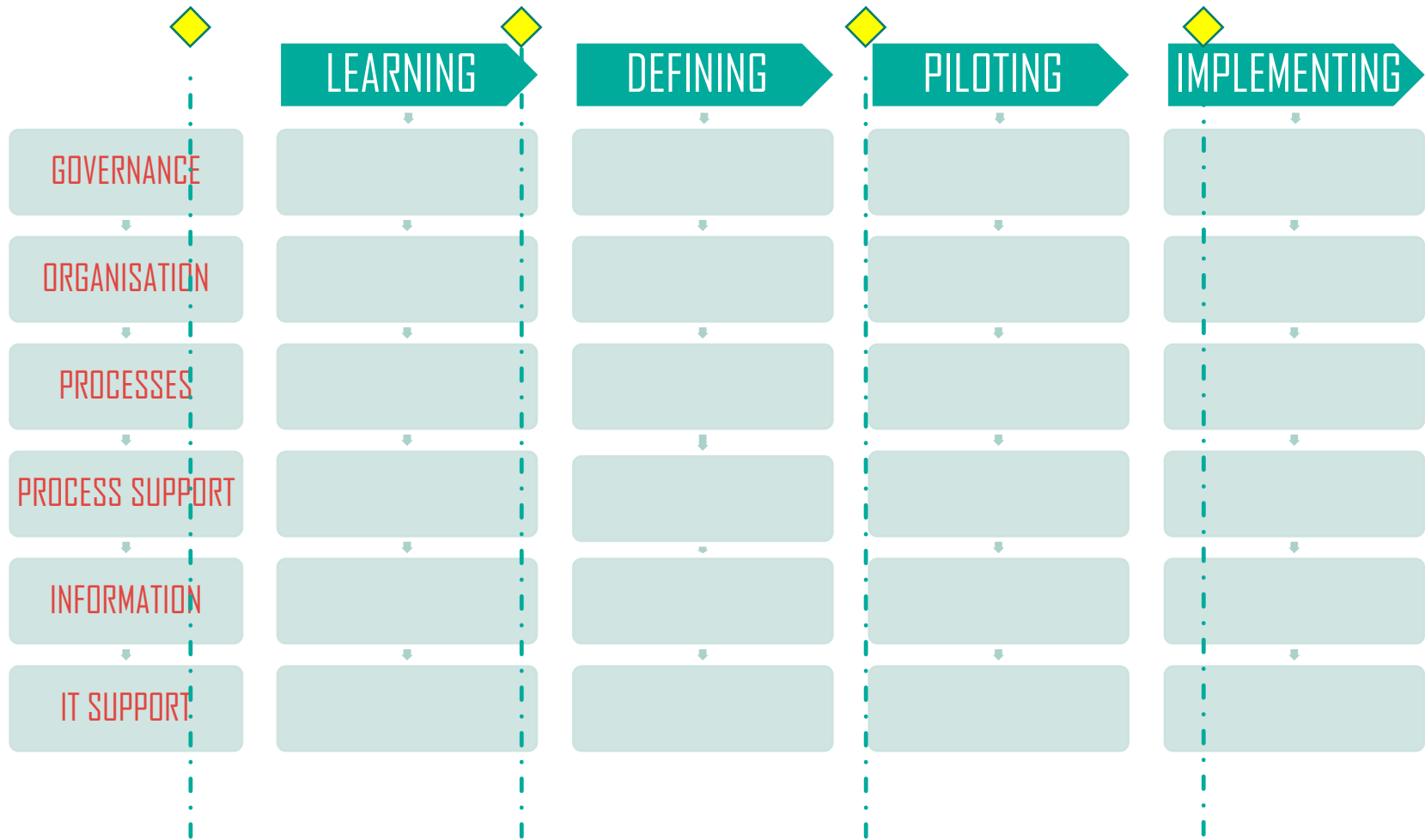
# Balancing the Capability with Business Needs and Situation



# Capability Tailoring Concepts



# Syntell Generic Implementation Model

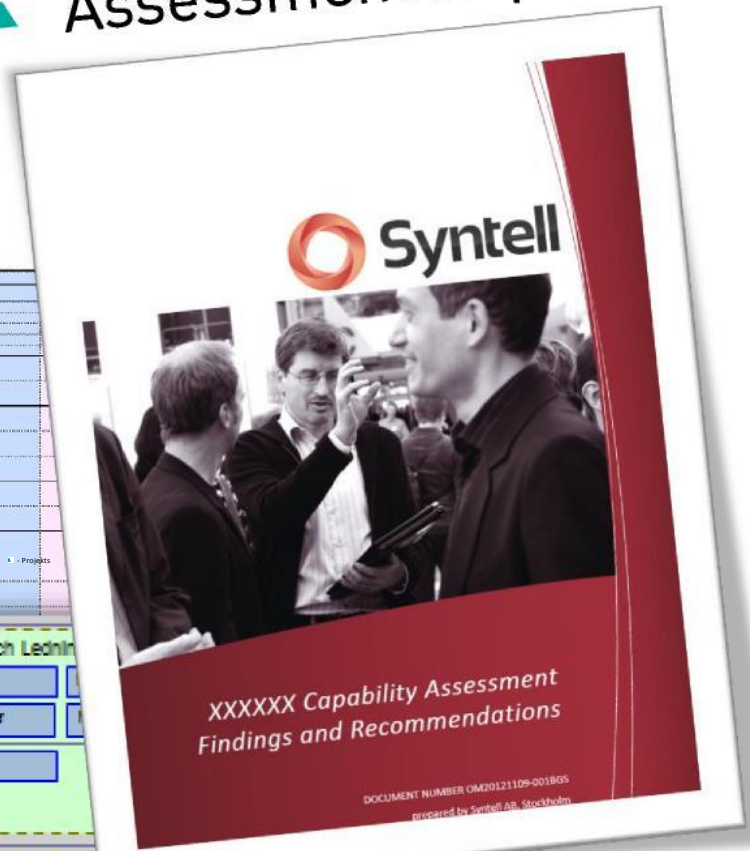
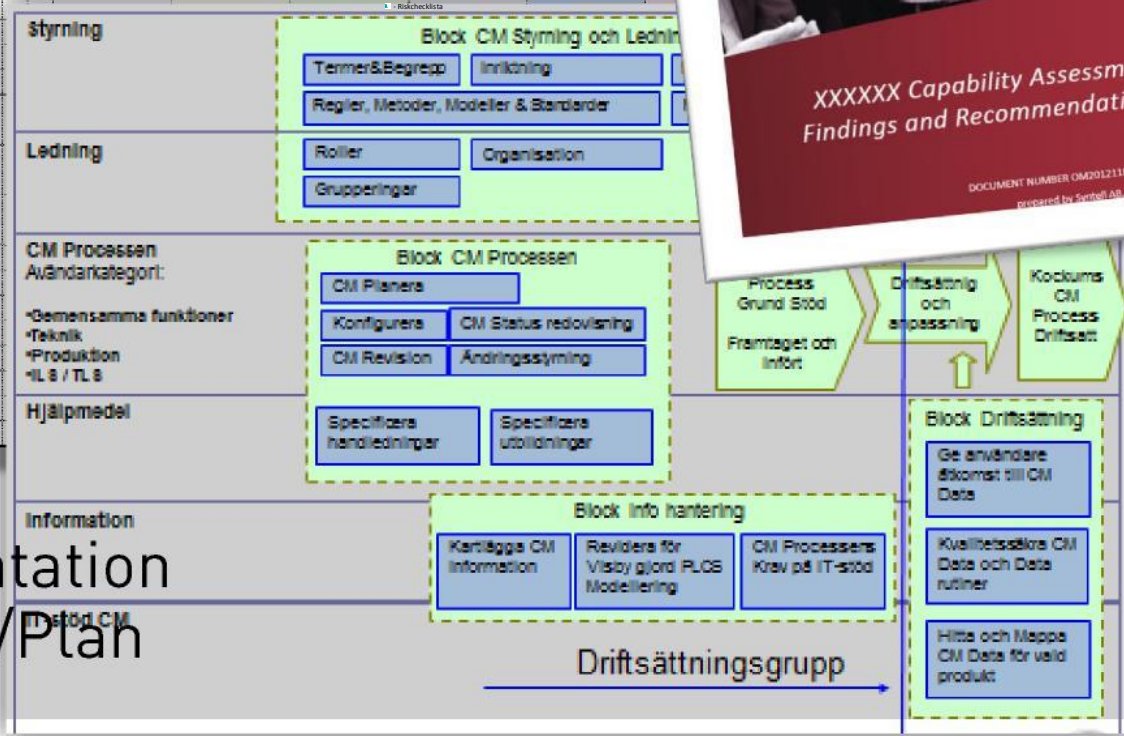




# Deliverables

## Assessment Map (As-Is/To-Be)

Process	PROJ	MOGNAL	VIKTIGHET	GOVERNANCE	ORGANISATION	PROCESSES	PROCESS SUPPORT INFORMATION
Agreement Acquisition	3	2	2	H	H	M	2, 5, 3
Life Cycle Management	H	0	0	0	0	0	2, H, H, M, 3, M
Infrastructure Management	L	2	1	1			M, M, L, 2, L
Project Portfolio Management	H	1	1	1			H, H, H, 3, H
Human Resource Management	M	2	1	1			H, H, M, 3, M
Quality Management	M	3	2	2			H, M, L, 2, 3, M
Project planning	H	2	1	1			2, H, H, M, 2
Project Assessment and Control	H	1	1	3			H, H, H, 3, M
Decision Management	L	2	1				M, M, M, 1, 3, M
Risk Management	H	0	0	3			H, H, H, 1
Configuration Management	H	1	1	3			H, H, H, H
Information Management	L	2	2	1			H, M, L, 2
Measurement	L	2	2	1			M, L, L, 2
Standards Requirements Definition	H	1					M
Requirements Analysis	H	2					H
Architectural Design	H	1					M
Implementation	2	2	3	1			H, L, 2
Integration	M	1	1	1			3, H, H, H, 2
Verification	3	2	3	1			H, H, H
Transition	2	2	1	3			M, H, H
Validation	L	3	3	1			L
Operation	M	2	2	1			2, M, M, M, 1
Maintenance	M	2	1	1			2, H, M, M, 1
Disposal	M	1	1	0			H, L, L



XXXXXX Capability Assessment Findings and Recommendations

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prepared by Syntell AB, Stockholm

## Implementation Roadmap/Plan

# Questions?



**Syntell**

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