7th Central and Eastern European
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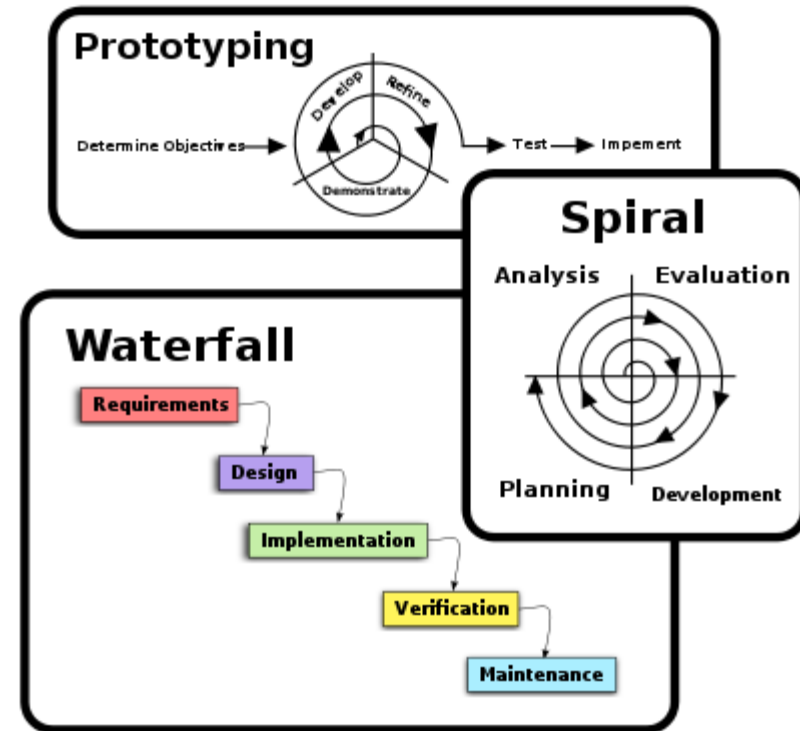
Concordant Suite of Process Models

Grigory Gusev

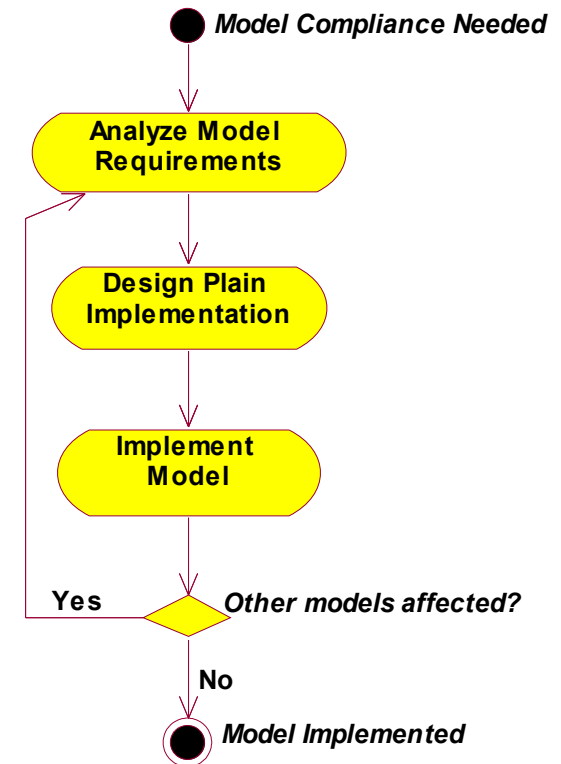LUXOFT
Expertise in Software Services

Process Compliance for an Outsourcing Company

- Standard/Model/Methodology compliance required by the Customers
- Need to be compliant with several models
- Urgent / vague need results in straightforward and non-optimal implementation of every next model
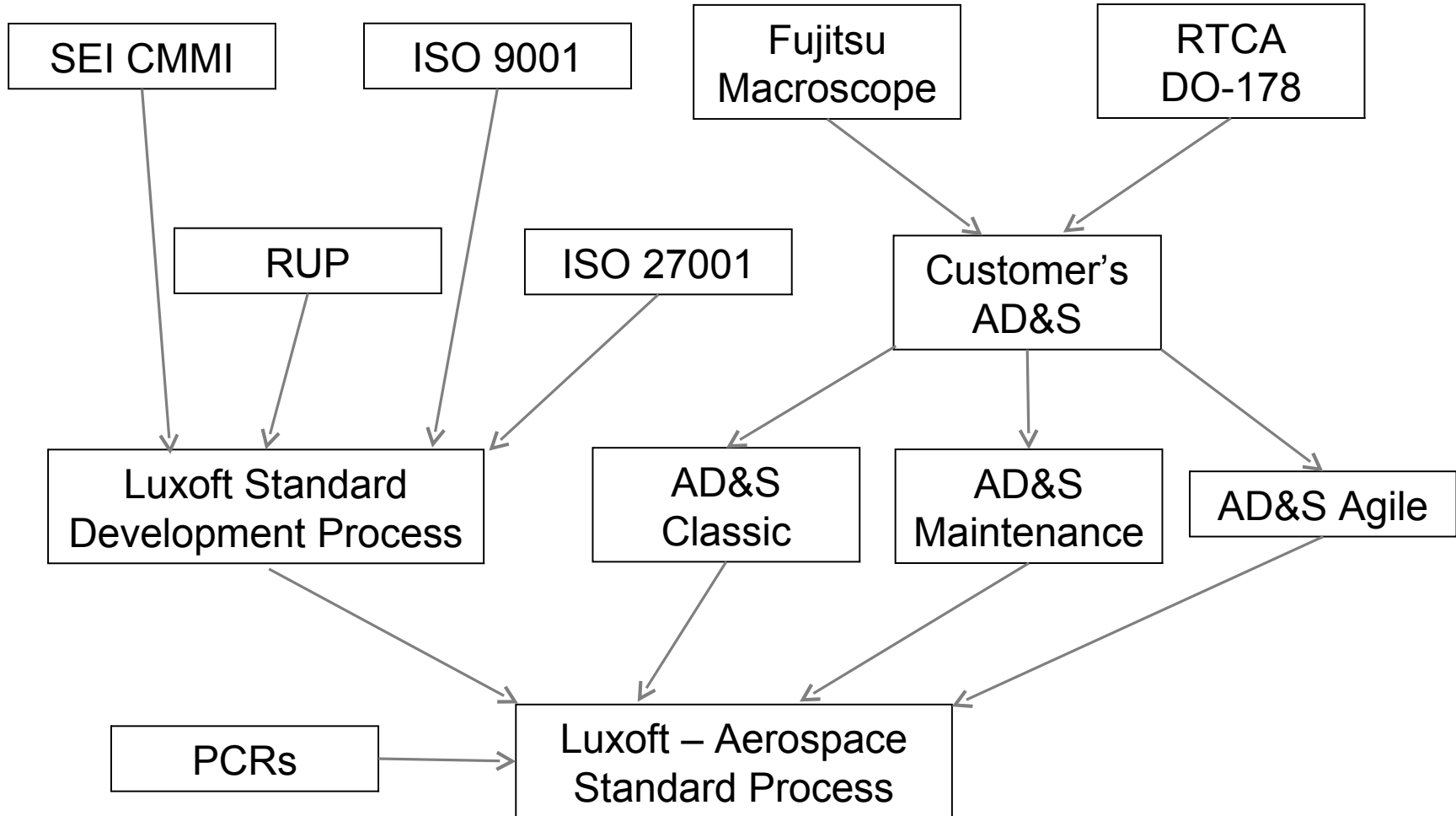

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Plain Incorporation of a Model

- Resulting work instructions, templates, and artifacts may be good for 'demonstrate compliance' needs only
- Implementation of a next model may:
  - result in parallel sets of artifacts
  - be harmful for business
  - reinvent the wheel, i.e. not employ previously implemented models' experience and artifacts
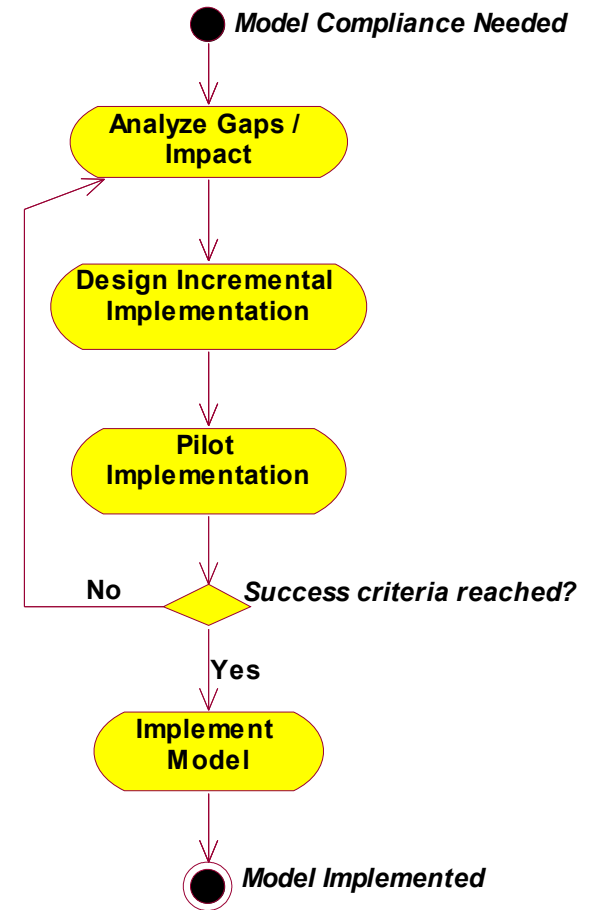 - be not optimal for compliance to previously implemented models

Model Compliance Needed

Analyze Model Requirements

Design Plain Implementation

Implement Model

Yes — *Other models affected?*

No

Model Implemented

# Process Requirements to Luxoft Aerospace Delivery Center

Incremental Implementation of a Next Model

- To find 'Gaps' – compare the new model requirements with the requirements to the existing models.
- Requirements comparison requires model mapping to process artifacts
- If a coinciding pair of requirements is found, consider the new model's requirement satisfied
- Mind the piloting

● Model Compliance Needed

Analyze Gaps / Impact

Design Incremental Implementation

Pilot Implementation

No — Success criteria reached?

Yes

Implement Model

◉ Model Implemented

Process Model Mapping

- Segment – Requirement can be expanded to reflect model's structure

- Practice – Template components may or may not be explicitly presented in a standard

- Policy – Area – Work Instruction items should always be the organization's own creativity

- Arbitrary or Agile requirements should be specified by the organization before mapping
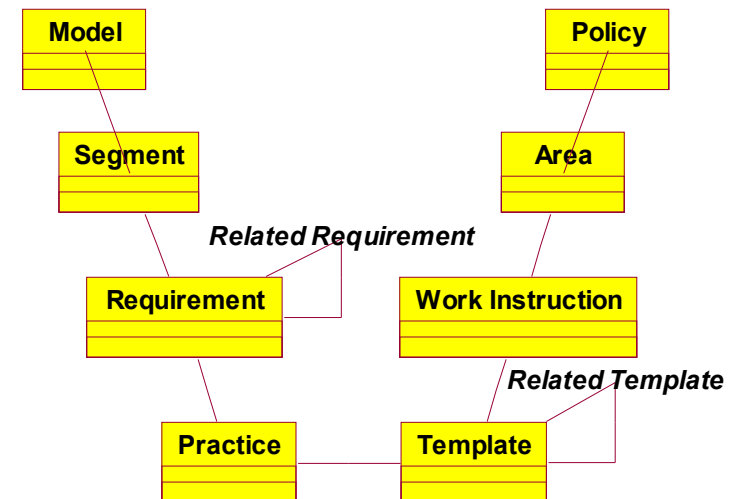
Enhanced Mapping for CMMI
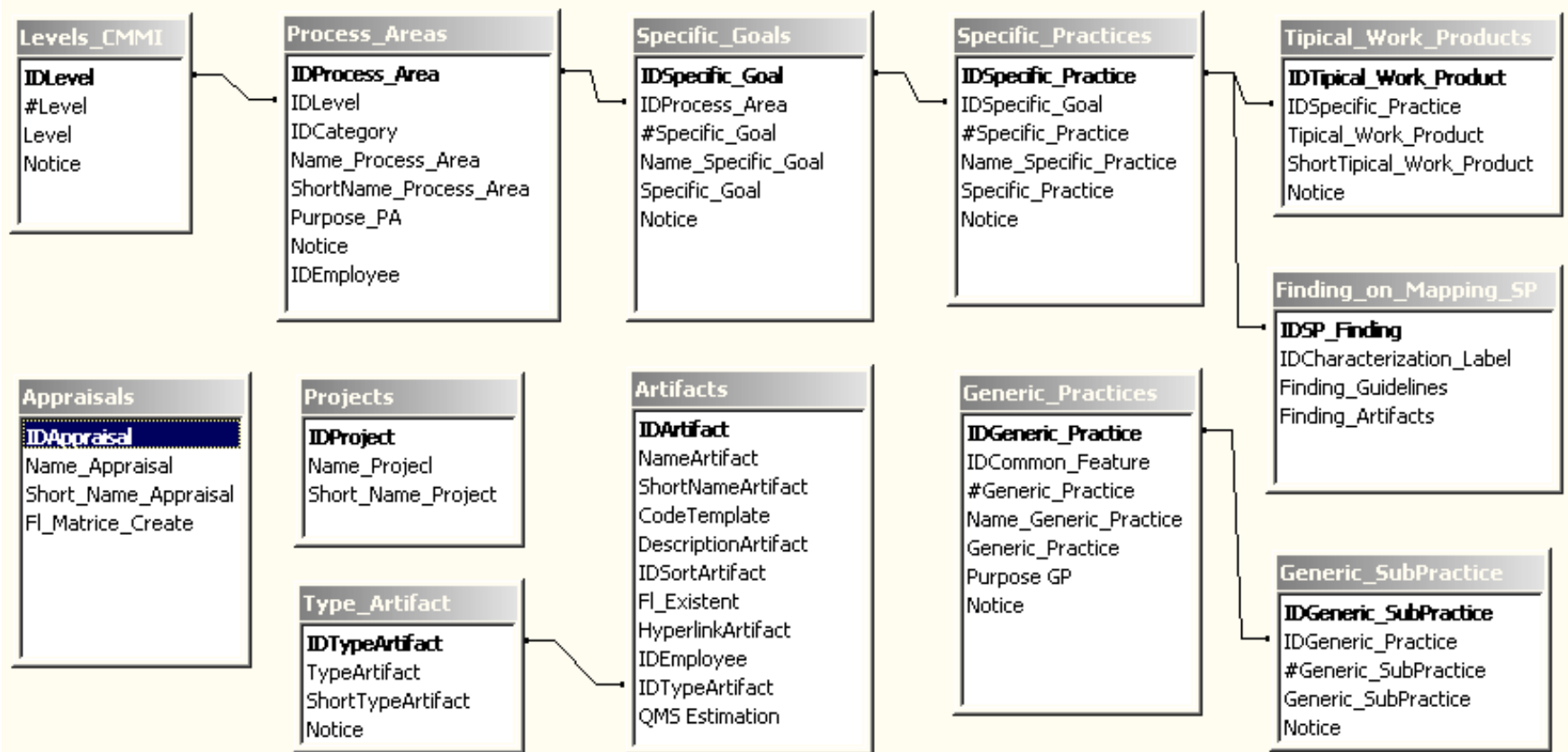
Template Sections Mapping (Example)

Luxoft Phase	Luxoft Template	Luxoft Template Section	Macroscope Template	Macroscope Template Section
Analysis&Requirements	ZZZ-110-00-(Vision)	3. Problem Statement	P140S_Owner_Requirements.doc	1. Objectives
Analysis&Requirements	ZZZ-110-00-(Vision)	3. Problem Statement	P240S User Principles	1 General Principles
Analysis&Requirements	ZZZ-110-00-(Vision)	4. User Description	P230S_User_Alternatives	1.1 Concerns
Analysis&Requirements	ZZZ-110-00-(Vision)	5. Product Overview	P140S_Owner_Requirements.doc	2. System Scope
Analysis&Requirements	ZZZ-110-00-(Vision)	5. Product Overview	P240S User Principles	2. Administrative and work organizational princip
Analysis&Requirements	ZZZ-110-00-(Vision)	6. Product Features	P250U_Function	1. Function Description
Analysis&Requirements	ZZZ-110-00-(Vision)	7. Constraints	P140S_Owner_Requirements.doc	4. Principles
Analysis&Requirements	ZZZ-110-00-(Vision)	8. Precedence and Priority	P140S_Owner_Requirements.doc	4. Principles
Analysis&Requirements	ZZZ-110-00-(Vision)	9. Other Product Requirements	P261S_Developer_Principles	3.Developer Global Quality Criteria
Analysis&Requirements	ZZZ-120-00-(SRS)	3. Data Requirements	P261S_Developer_Principles	1.5. Data Management
Analysis&Requirements	ZZZ-120-00-(SRS)	4. Usability Requirements	P360S_User_Standards	2. User Interface Standards
Analysis&Requirements	ZZZ-120-00-(SRS)	4. Usability Requirements	P240S User Principles	3. User Interface Principles
Analysis&Requirements	ZZZ-120-00-(SRS)	5. Reliability Requirements	P261S_Developer_Principles	3.4 Reliability
Analysis&Requirements	ZZZ-120-00-(SRS)	6. Performance/Capacity Requirements	P261S_Developer_Principles	3.5 Efficiency
Analysis&Requirements	ZZZ-120-00-(SRS)	7. Maintainability Requirements	P261S_Developer_Principles	3.6 Maintainability
Analysis&Requirements	ZZZ-120-00-(SRS)	8. Compatibility Requirements	P261S_Developer_Principles	3.1 Interoperability
Analysis&Requirements	ZZZ-140-00-(Glossary)	3. Definitions	P200S_Owner_System_Structure.doc	1. Information System Structure
Analysis&Requirements	ZZZ-140-00-(Glossary)	3. Definitions	P201S_System_Processes.doc	1. Organization's Resources
Analysis&Requirements	ZZZ-150-00-(UseCasesSpecifications)	2.1 Definition	P180S_Core_Component_Specification.doc	1.1.1 Service Definition
Analysis&Requirements	ZZZ-150-00-(UseCasesSpecifications)	2.1 Definition	P251S_Work_Processes.doc	2.1 Work Process Definition
Analysis&Requirements	ZZZ-150-00-(UseCasesSpecifications)	2.2 Flow of Events	P251S_Work_Processes.doc	2.2 Sequencing of the Unit Tasks of the Work P
Analysis&Requirements	ZZZ-150-00-(UseCasesSpecifications)	2.1 Definition	P490S_Unit_Task_Specification.doc	1. Unit Task Description
Analysis&Requirements	ZZZ-150-00-(UseCasesSpecifications)	2.2 Flow of Events	P490S_Unit_Task_Specification.doc	2. Unit Task Dynamics
Analysis&Requirements	ZZZ-150-00-(UseCasesSpecifications)	2.2.1 Basic Flow	P490S_Unit_Task_Specification.doc	3. Task Steps
Analysis&Requirements	ZZZ-150-00-(UseCasesSpecifications)	2.2.2 Alternative Flows	P490S_Unit_Task_Specification.doc	3. Task Steps
Analysis&Requirements	ZZZ-150-00-(UseCasesSpecifications)	2.3 Extensions	P490S_Unit_Task_Specification.doc	3. Task Steps
Analysis&Requirements	ZZZ-190-00-(Requirements Management	3. Requirements Management Plan	P405S_Test_Strategy	4. Requirement Management approach
Analysis&Requirements	ZZZ-190-00-(Requirements Management	3.4 Attributes	P900S_Requirements_Trace	2. Requirement Attributes
Analysis&Requirements	ZZZ-195-00-(Traceability Matrixes)	Requirements components mapping	P900S_Requirements_Trace	Requirements components mapping
Analysis&Requirements	ZZZ-250-00-(Report specification)	2. Report Specification	P490S_Unit_Task_Specification.doc	3. Task Steps
Analysis&Requirements	ZZZ-250-00-(Report specification)	2. Report Specification	P490S_Unit_Task_Specification.doc	4.1.2 User Interface Service
Analysis&Requirements	ZZZ-250-00-(Report specification)	2. Report Specification	P186S_Reusable_User_Interface_Componen	2.3 User Interface Service
Analysis&Requirements	ZZZ-260-00-(Screen Specification)	2. Screen Specification	P490S_Unit_Task_Specification.doc	4. User Interface Components
Analysis&Requirements	ZZZ-260-00-(Screen Specification)	2. Screen Specification	P176U_User_Interface_Category	2. User Interface Components

CMMI Appraisal Mapping (Example)

Process Artifacts to CMMI Mapping (Example)

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Artifacts

Artifacts

| List of Artifacts | Related PA | Reports and Queries |

Related SP

	Artifact	#SP	Specific Practice	PA	
	Causal Analysis Report	SP 2.2	Take Corrective Action	PMC	
	Causal Analysis Report	SP 2.1	Implement the Action Proposals	CAR	
	Causal Analysis Report	SP 1.1	Select Defect Data for Analysis	CAR	
	Causal Analysis Report	SP 1.6	Contribute to the Organizational Process Assets	IPM	
▶	Causal Analysis Report	SP 2.1	Analyze Issues	PMC	

Related GP

	Artifact	#GP	Generic Practice	PA	
	Causal Analysis Report	GP 2.10	Review the activities, status, and results of the causal analysis and resolution process with higher level management and	CAR	
▶	Causal Analysis Report	GP 3.1	Establish and maintain the description of a defined causal analysis and resolution process.	CAR	

Simplification of Mapping (Example)

Model	Segment	Requirement – Practice	Template

CMMI-DEV	**RD** (Requirements Development)	**RD SP 2.1** Establish Product and Product Component Requirements	P490S Unit Task Specification
DO-178B	**5.** Software Development Process	**5.1.1b** Derived high-level requirements are defined	P261S Developer Principles

2 ⊗ (between RD SP 2.1 and 5.1.1b)

1 ⊗ (between 5.1.1b and P261S Developer Principles)

1 ⊗ Simplification 1: Omit relationship between DO 5.1.1b Requirement and P261S template – the only inaccuracy will be vagueness if P490S, P261S, or both templates implement the DO 5.1.1b Requirement

2 ⊗ Simplification 2: Omit the DO 5.1.1b Requirement altogether – the risk will be that the template, DO requirement or CMMI requirement may change the way that affects the omitted relationship

Simplified Mapping Tactics

- Select a "basic" model (may be 2 or more models) that:
    - covers most of the company's process practices, ~70%;
    - org is committed to the model compliance in the future;
    - model certification methodology requires generating model requirements traceability coverage.
- Make complete mapping of the basic model.
- Make mapping of the other models to the basic model requirements and their additional requirements to the process documents (Simplification 1).
- Map template sets to each other, if there are two or more sets of templates imposed by the models.

Important Activities of Piloting

- Select appropriate scope:
  - Representative;
  - Not excessive.
- Define clear success criteria:
  - Reflect piloting goals;
  - Plan goals' check.
- Allow time for corrections:
  - Normally, re-piloting is not required, defects are retested at mass deployment.

Conclusions (1 of 2)

- Consistent, single and practical process is possible

- Implement models **incrementally**, start as **early** as possible as implementation effort cannot be estimated

- Two main ideas for smooth incremental model implementation:
  - Start with identifying of unique requirements; use process-to-requirements mapping for that;
  - Pilot the designed process changes on representative projects before mass deployment.

- Practices implementing both ideas are easier than it may seem, simpler than software engineering practices

Conclusions (2 of 2)

"All models are wrong, but some are useful."

[George Box - Quality and Statistics Engineer]
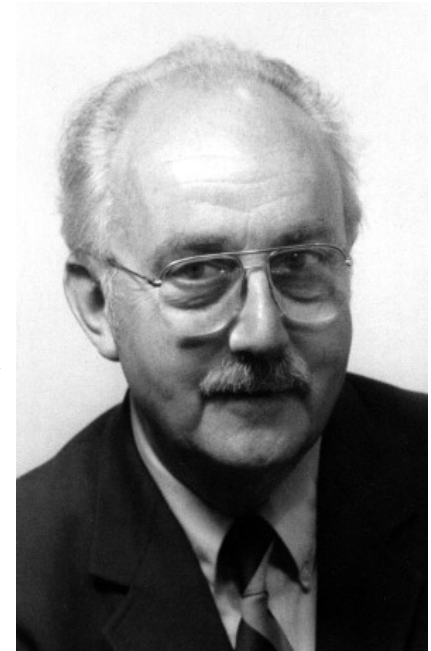
"… and no model will be harmful, if properly implemented."

[Luxoft]

Thank you

- Questions?