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A language for process map design

Monika Malinova - 7 September 2014

BPM14DC

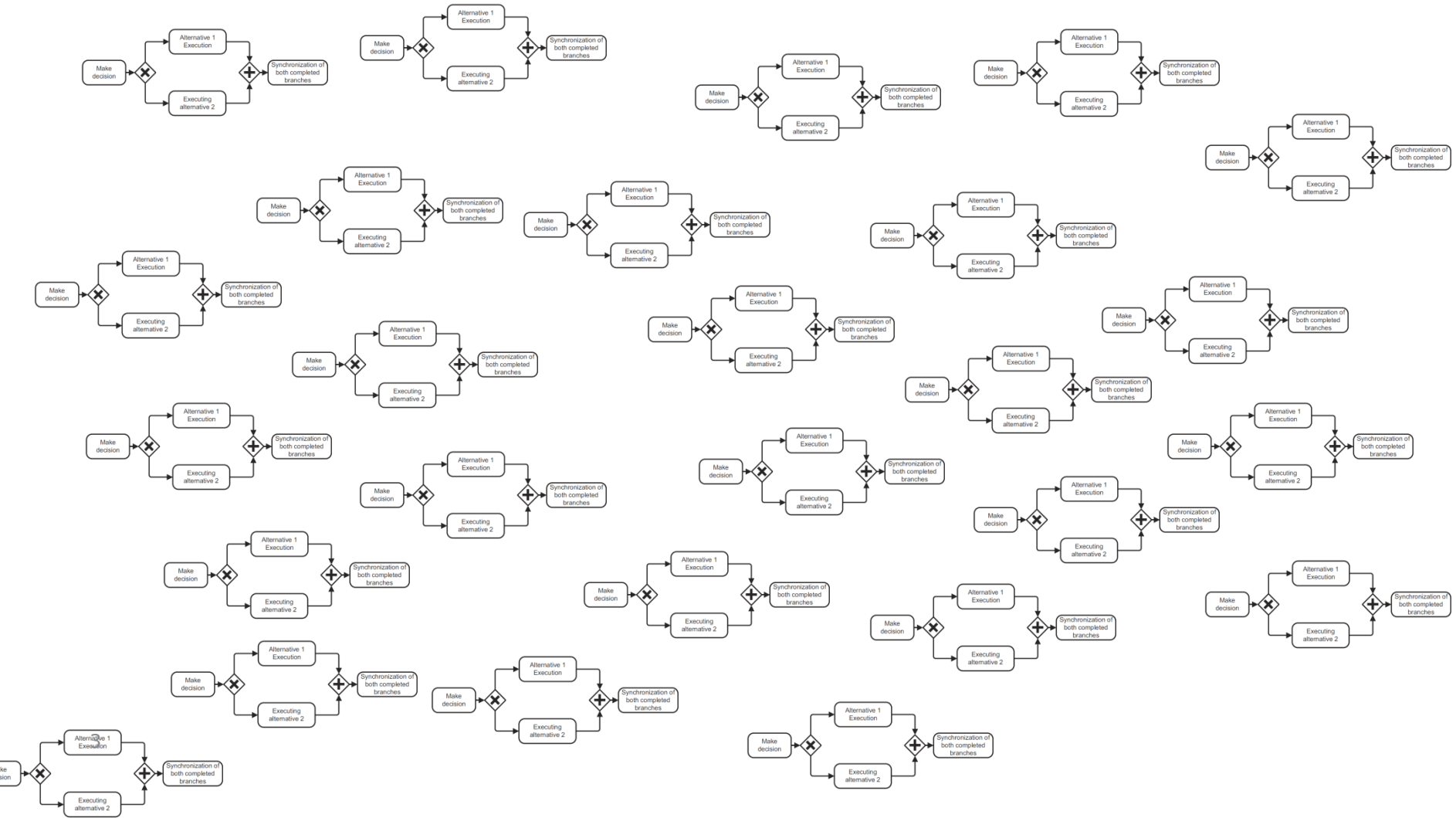
Agenda

- Motivation
 - Why are process maps important?

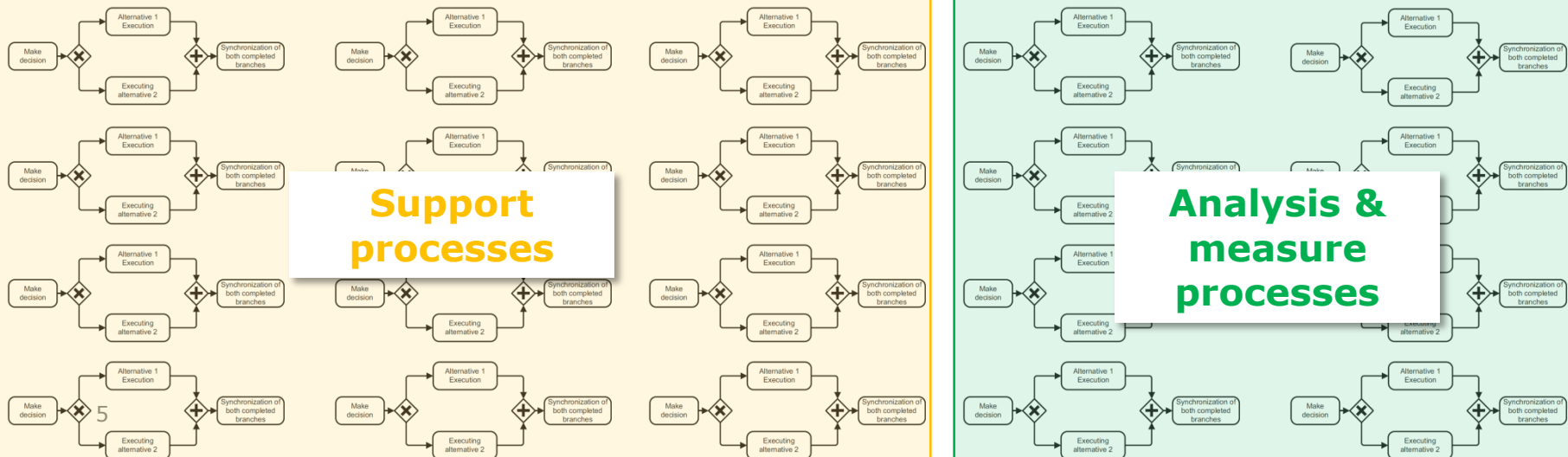
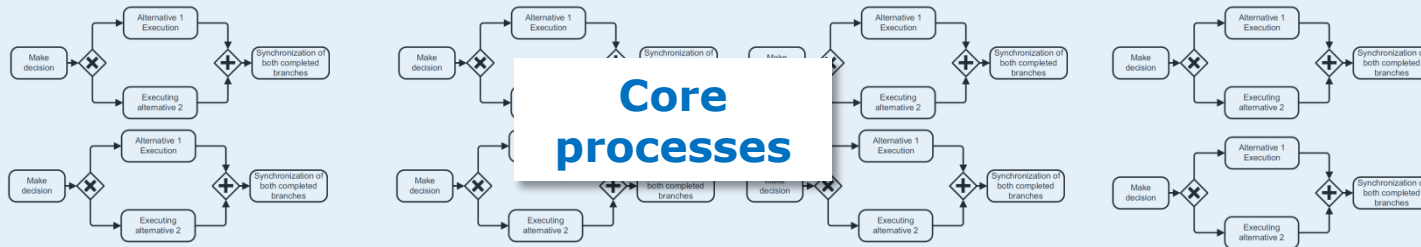
- Research questions
 - A language for the design of process maps
 - Methods
 - Work done

 - Process map integration with enterprise architecture
 - Methods

Why Process map?

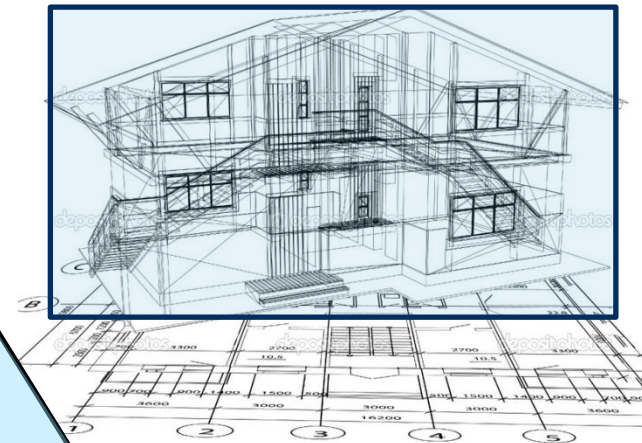
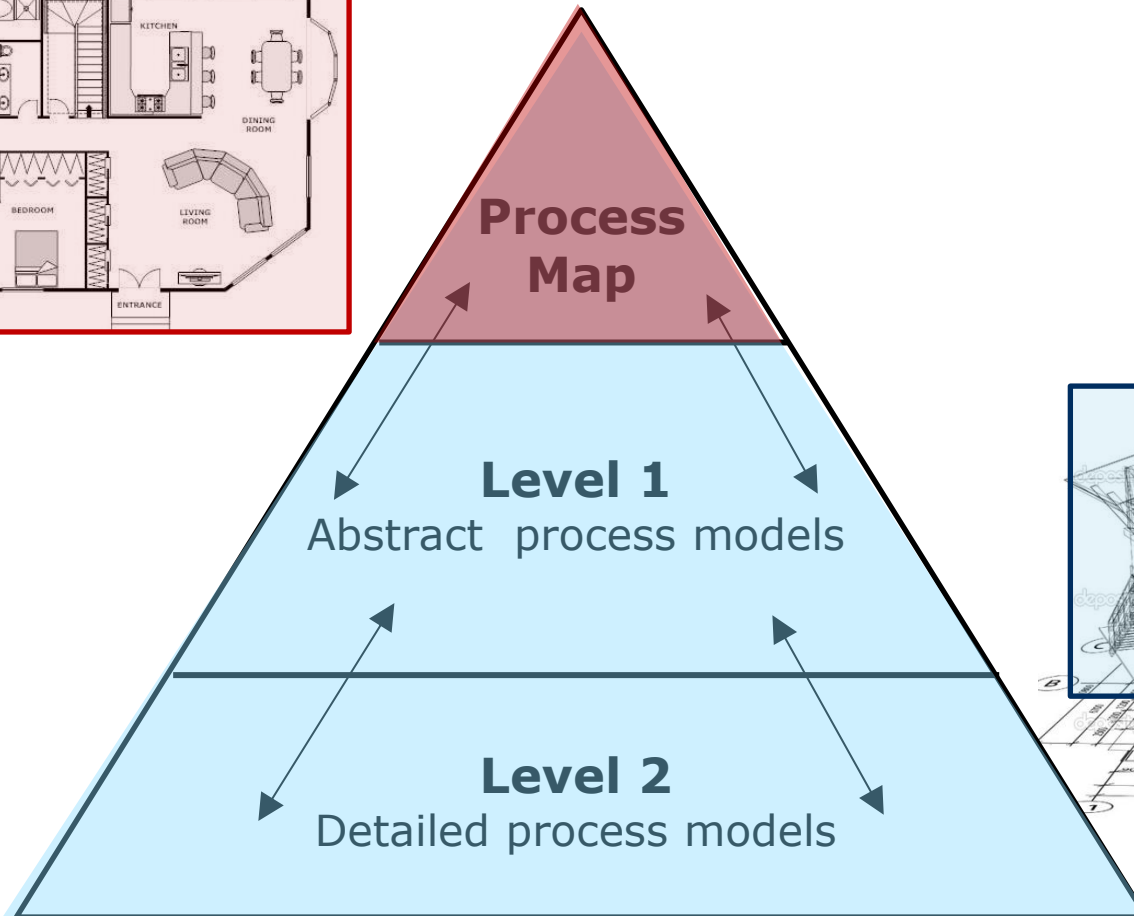
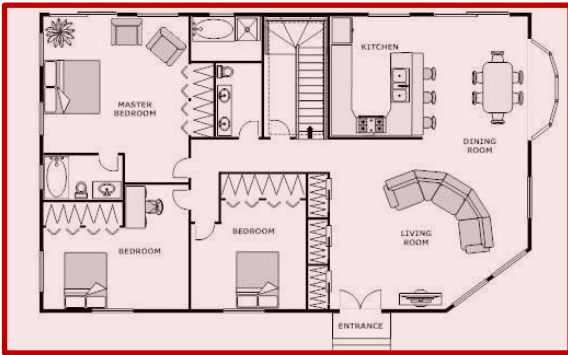


... and Abstraction



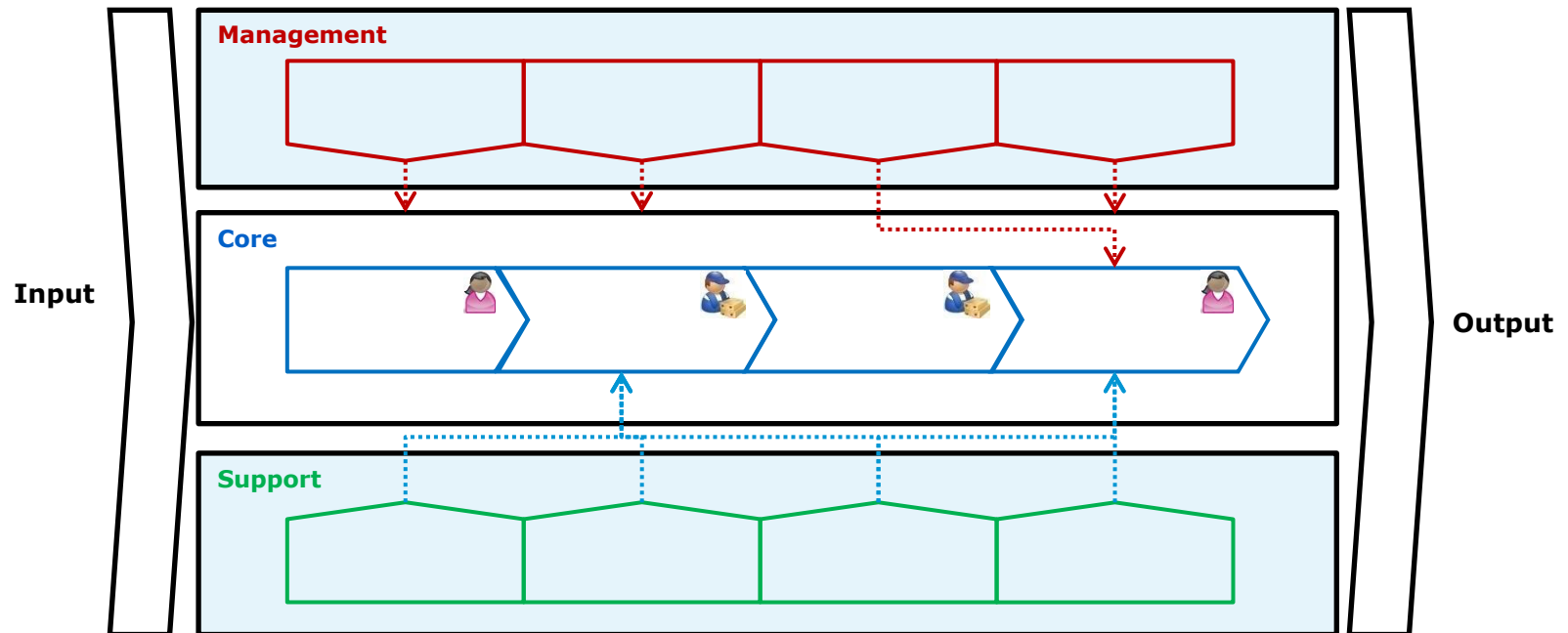
Process Architecture

PA is a collection of systematically organized process models within one organization.
PM is the entrance to the lower levels.

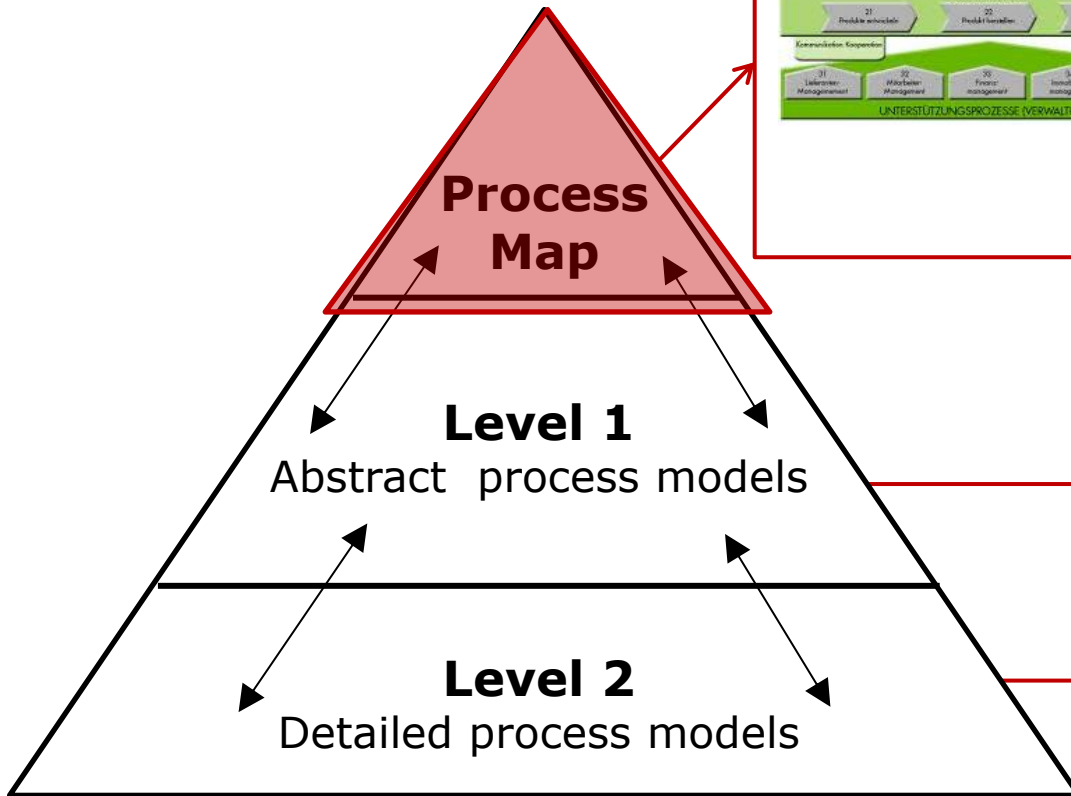


Process map

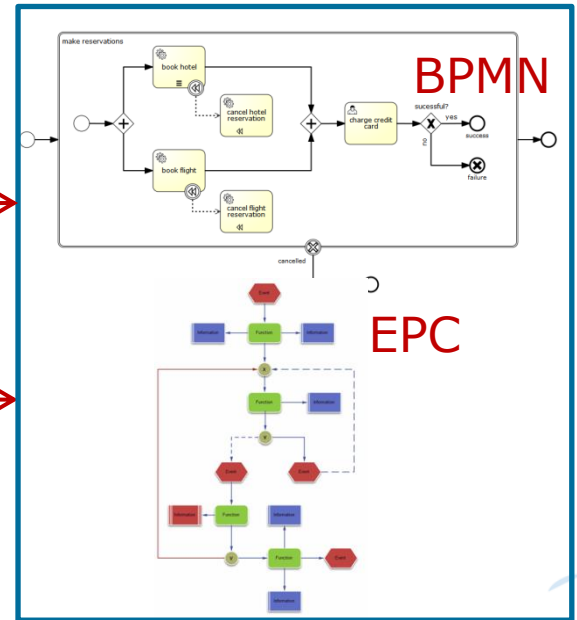
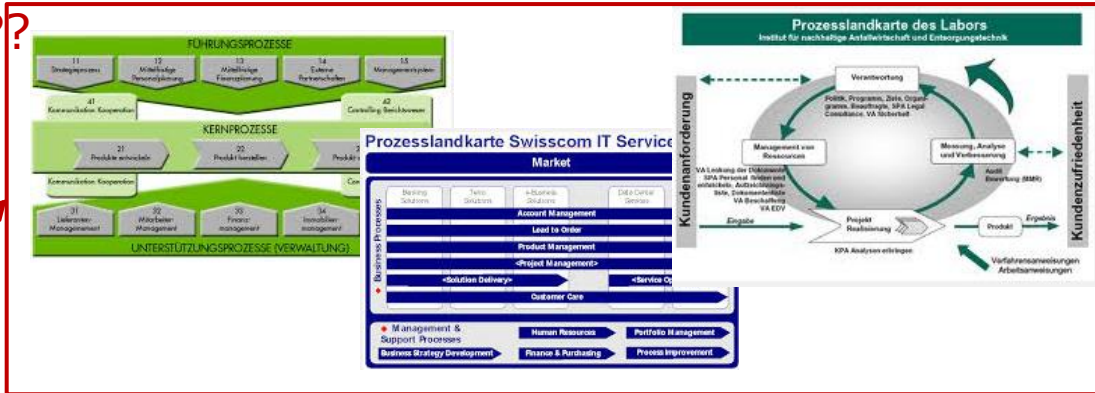
provide a basic understanding of how an organization operates without going into process details



State of the Art



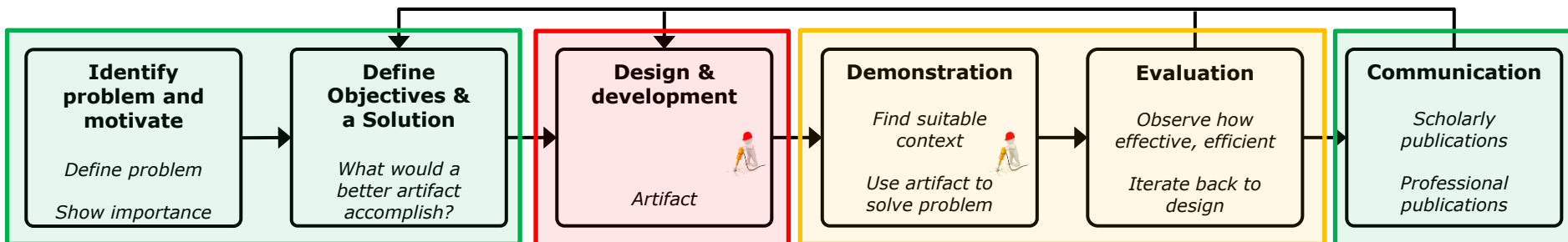
???



RQ

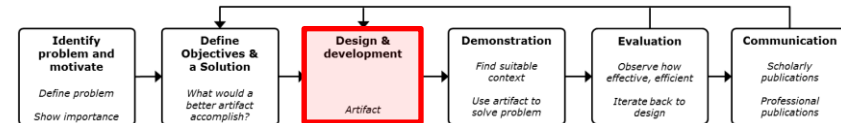
What are the components of a modeling language that provides extensive support for designing process maps?

Design science research methodology



Peffers et al. (2008)

Design & Development of the Process Map Language



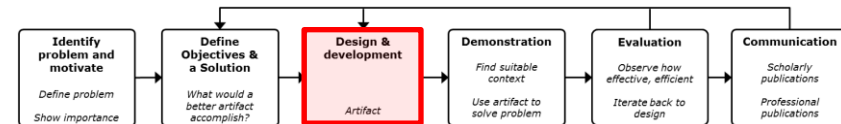
- Conduct systematic literature review on: guidelines, principles and quality criteria for modeling language design
- **Domain**
 - Process modeling, conceptual modeling, data modeling, domain-specific modeling, enterprise modeling, visual languages, etc.
- **Language-level & model-level**
 - What makes a modeling language good (easy to use, appropriate ...)?
 - What makes a model good (easy to understand, easy to use, ...)?

Guideline: a rule that provides guidance to appropriate modeling.

Principle: a standard that is accepted as true and used to improve the quality of modeling languages. It helps designers meet the goals.

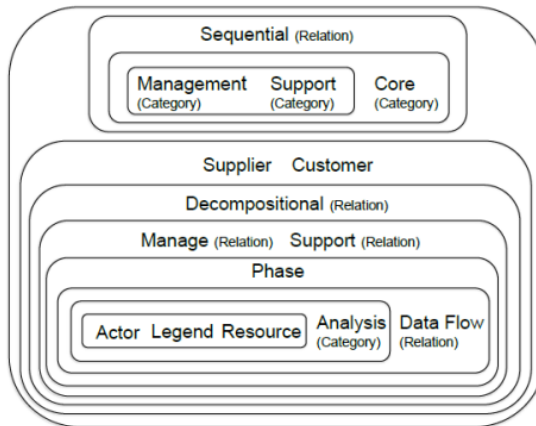
Quality criteria: a standard in terms of which something can be judged

Design & Development of the Process Map Language

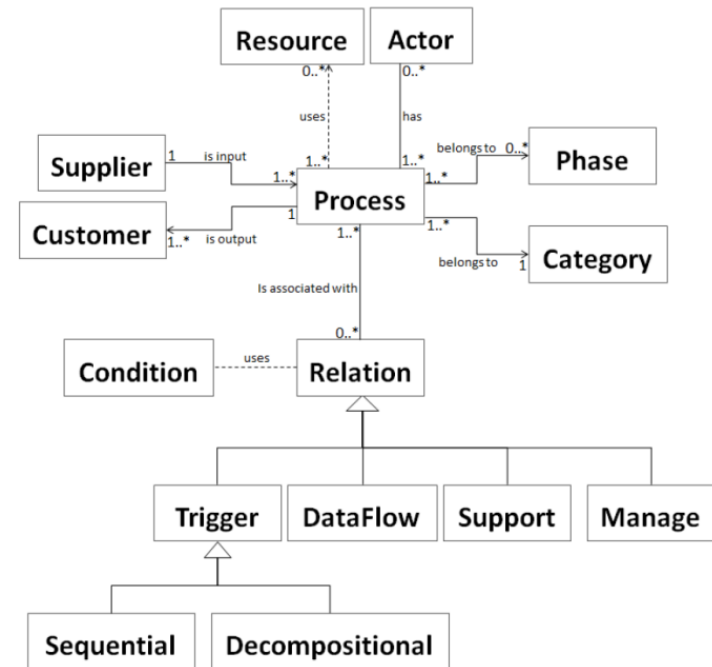


2. Analyze process maps from practice in order to identify

- Concepts used
- Relations between concepts
- Common combination of concepts

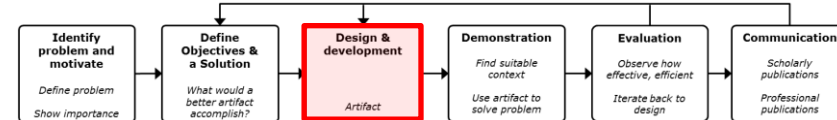


Hierarchical clusters of process map concepts (Malinova, Leopold & Mendling, 2014)



Process map meta-model (Malinova, Leopold & Mendling, 2014)

Design & Development of the Process Map Language

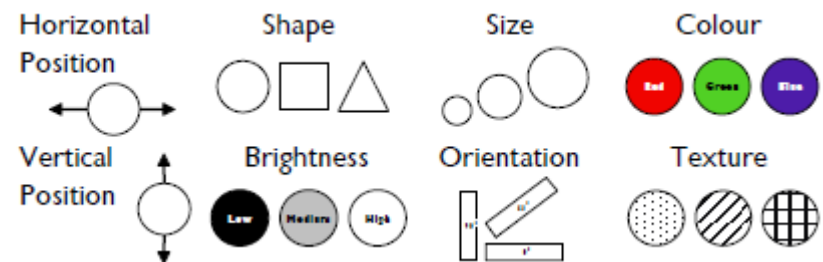


2. Use the nine principles by Moody (2009) as basis for discussing cognitive effectiveness of visual notations to

- Find out the symbols used to represent the concepts and relations
- Assess the cognitive effectiveness of the process maps from practice

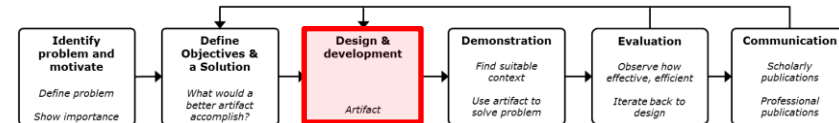
	Symbol redundancy	Symbol overload
Management		Management (3) Core (6) Main (1)
Core		Support (5) Subprocess (4) Analysis & Measure (2)
Main		Management (7) Core (4) Main (1)
Support		Subprocess (4) Analysis & Measure (3)
Subprocess		Management (4) Core (1)
Analysis & Measure	Support (3)	
	Core (4) Main (2) Support (1)	

Semiotic clarity: one-to-one correspondence between symbols and their referent concepts (Malinova & Mendling, 2013)



Visual variables: a visual alphabet for constructing visual notations (Bertin, 1983)

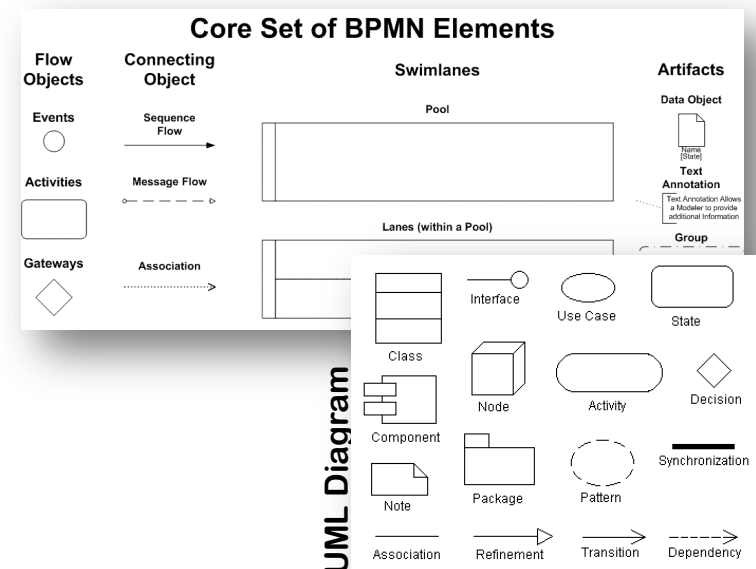
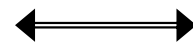
Design & Development of the Process Map Language



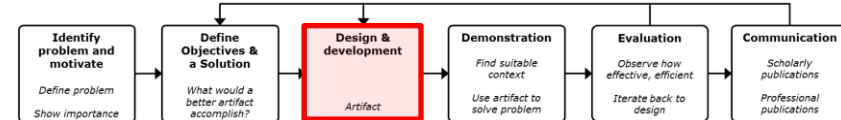
3. Semantically match symbols used by practitioners for process map design with symbols from existing modeling languages (e.g. BPMN)
- Propose symbols for representing concepts and relations between concepts

Symbol	Description	Symbol	Description
s1	Explicit process order	s7	Process
s2	Implicit process order	s8	
s3	Implicit process influence	s9	
s4	Explicit process order	s10	
s5	Input/Output	s11	
s6	Process contains subprocesses		
			(Process category)

Symbol description (Malinova & Mendling, 2013)

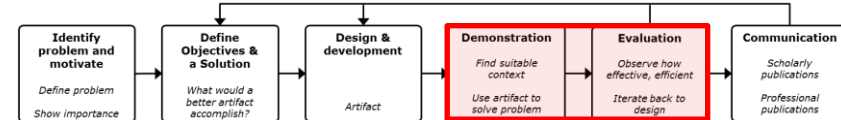


Design & Development of the Process Map Language



- Based on (1), (2), and (3) develop language for supporting process map design
 1. Conduct **systematic literature review** on: guidelines, principles and quality criteria for modeling language design
 2. Analyze process maps from practice to identify concepts used, relations between concepts and common combination of concepts (**process map meta-model**)
 - Use the nine principles by Moody (2009) as basis for discussing cognitive effectiveness of visual notations to find out the **symbols used** to represent the concepts and relations and assess the **cognitive effectiveness** of the process maps from practice
 3. **Semantically match symbols** used by practitioners for process map design with symbols from existing modeling languages (e.g. BPMN) to propose symbols for representing concepts and relations between concepts

Demonstration & Evaluation of the Process Map Language



- Validate the appropriateness of the language for designing process maps
 - Utilize the Norman's theory of action (Norman, 1986) used for communication through models

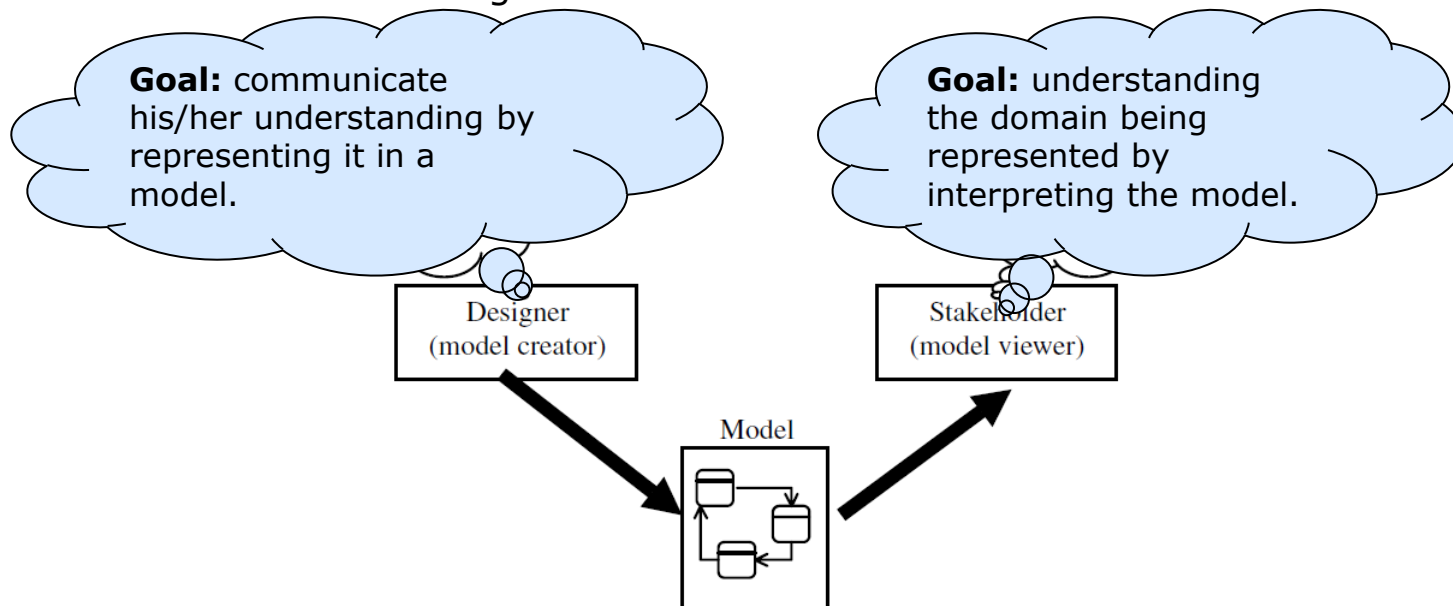
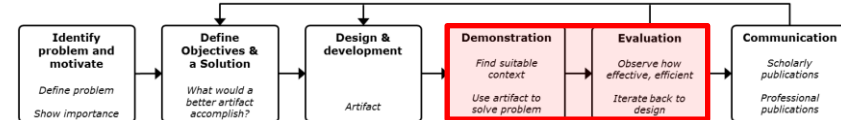


Fig. 2 Norman's [28] theory of action as applied to IS modeling.
Gemino & Wand (2004)

Demonstration & Evaluation of the Process Map Language



- Validate the appropriateness of the language for designing process maps
 - Communication through the process map

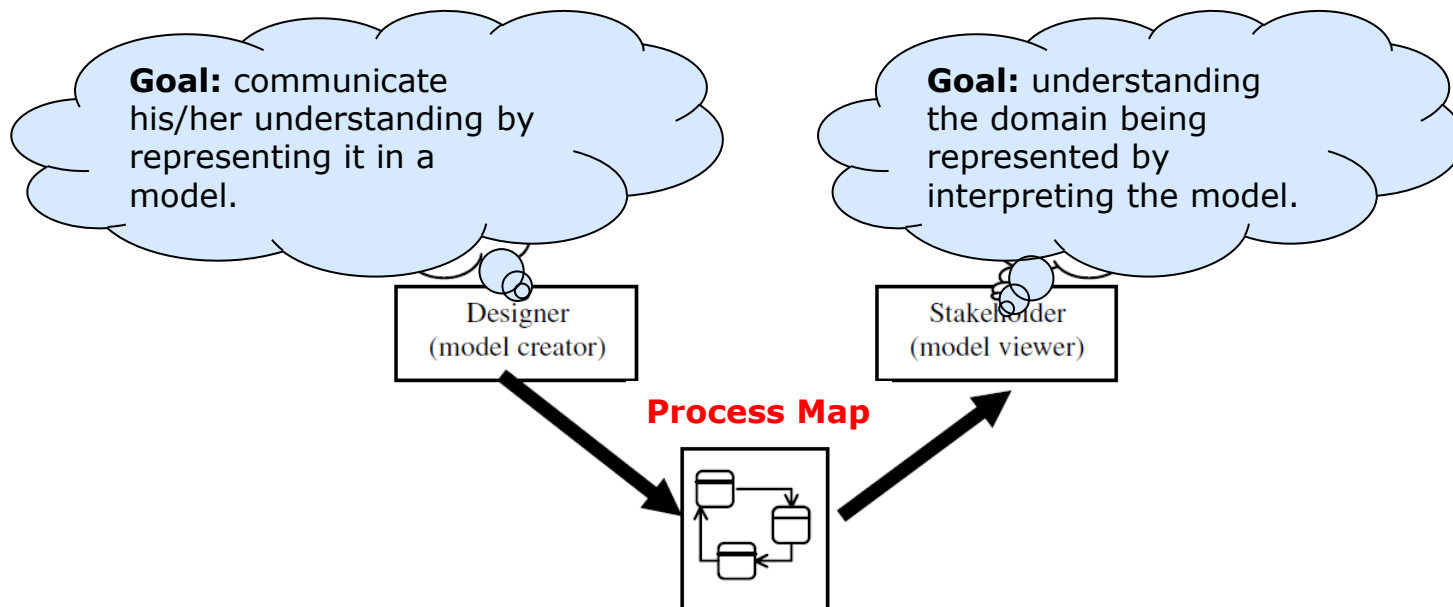


Fig. 2 Norman's [28] theory of action as applied to IS modeling.
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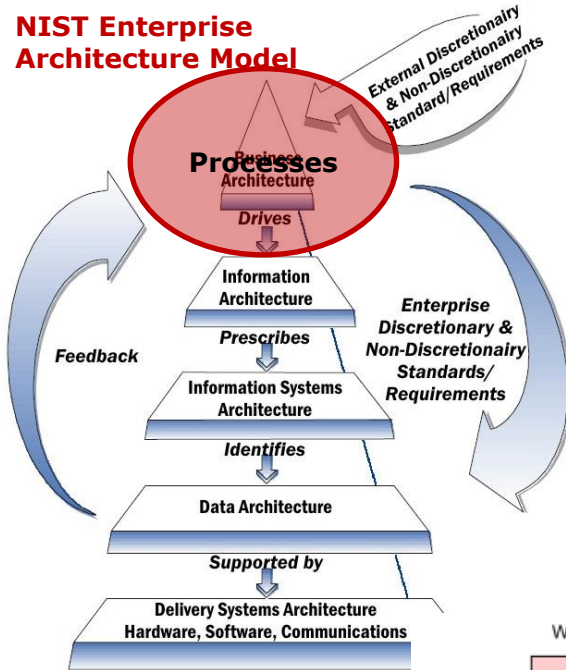
RQ

How can a process map be systematically integrated into enterprise architecture?

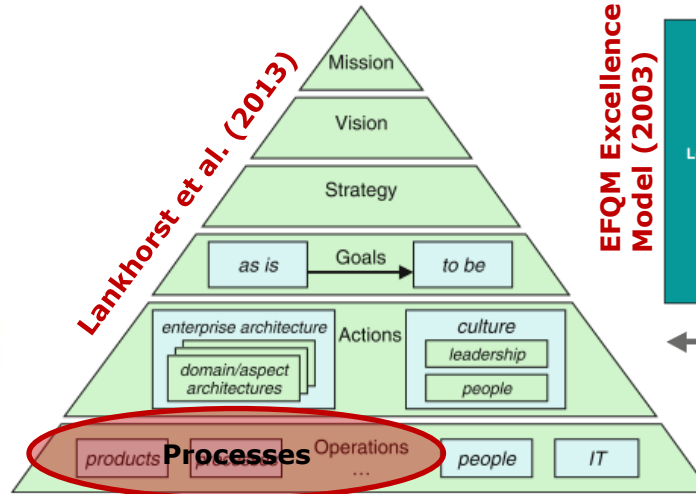
The bigger picture... Enterprise Architecture

incorporates the strategy, goals and parts that make these possible
consists of architectural views (interlinked and holistically represented), understood by different stakeholders

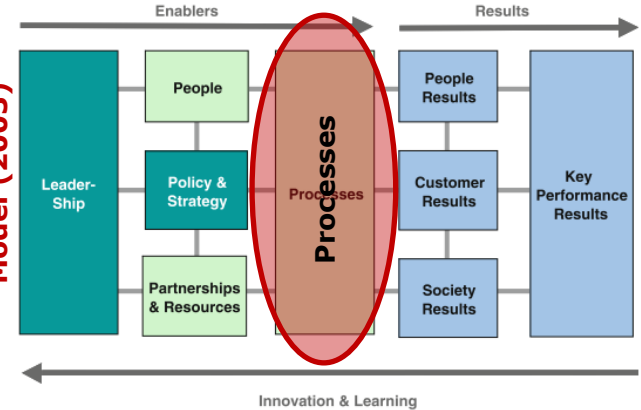
NIST Enterprise Architecture Model



Lankhorst et al. (2013)



EFQM Excellence Model (2003)



TOGAF Architecture Development Model (The Open Group 2011)

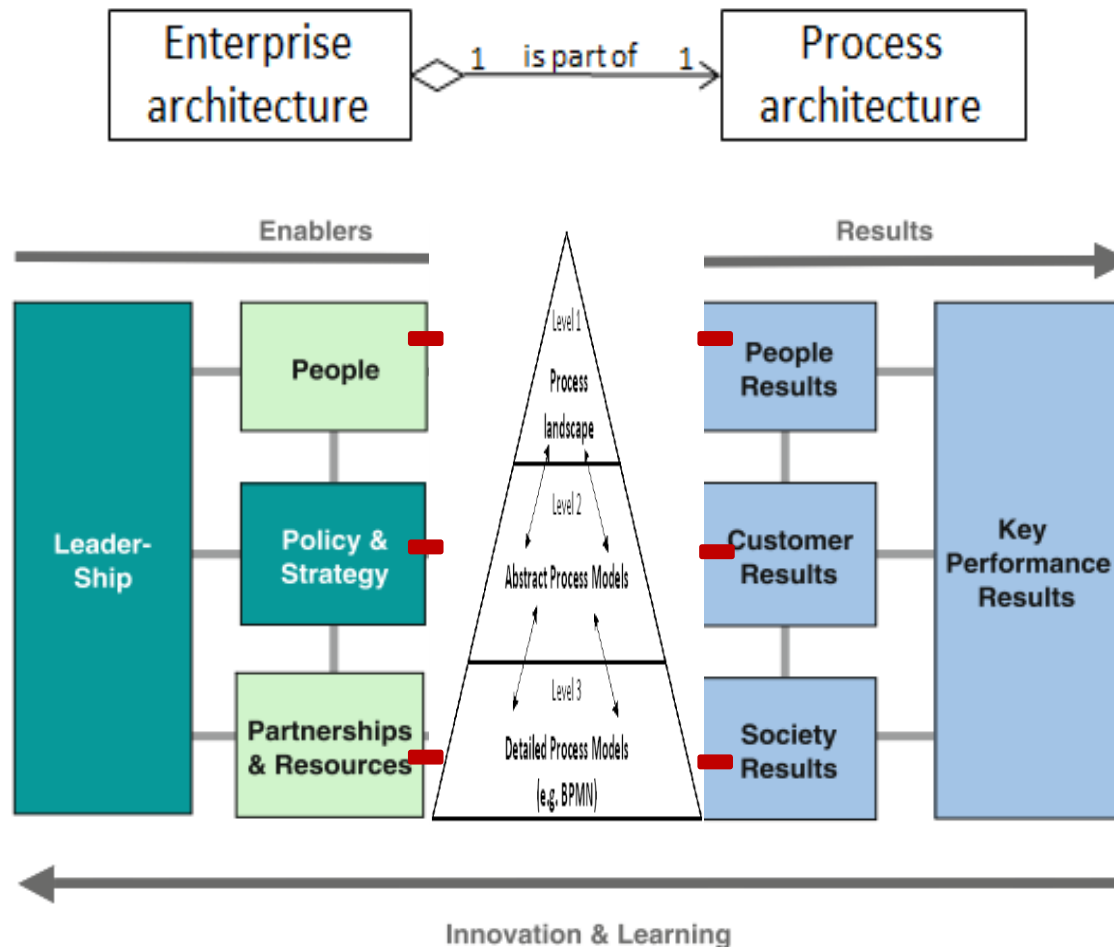


The Zachman Framework (Zachmann 1987)

	What?	How?	Where?	Who?	When?	Why?
Planner						
Owner						
Designer						
Builder						
Sub-contractor						
	Data	Function	Network	People	Time	Motivation

A red oval highlights the **Processes** area, which is the intersection of the **Planner** and **Owner** rows and the **Function** and **Network** columns.

Integration of Process Map into Enterprise Architecture



Process map integration with enterprise architecture

- Conduct literature review on
 - The parts that comprise enterprise architecture
 - The parts of enterprise architecture directly connected with the company's processes
 - The degree to which processes are affected by any change done in all other parts, and vice versa