

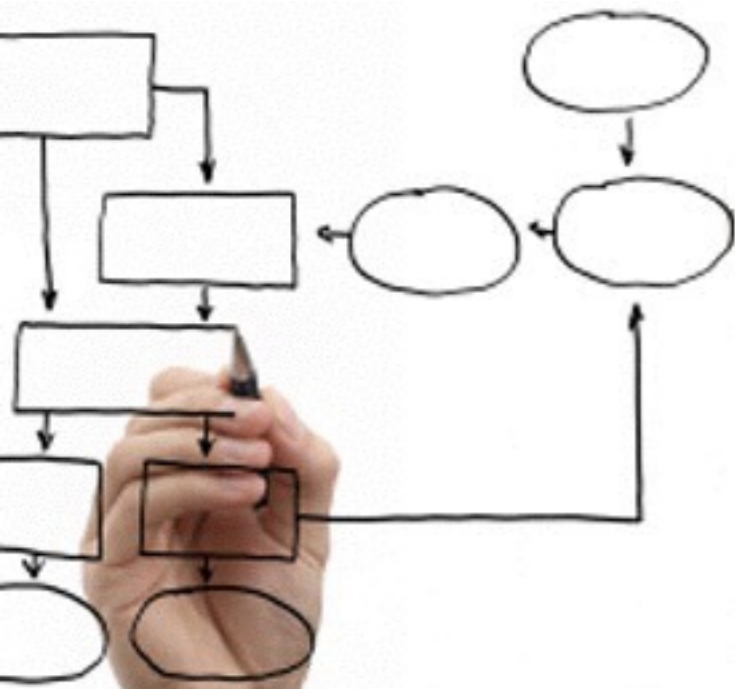
# Methods for the specification and verification of business processes

MPB (6 cfu, 295AA)

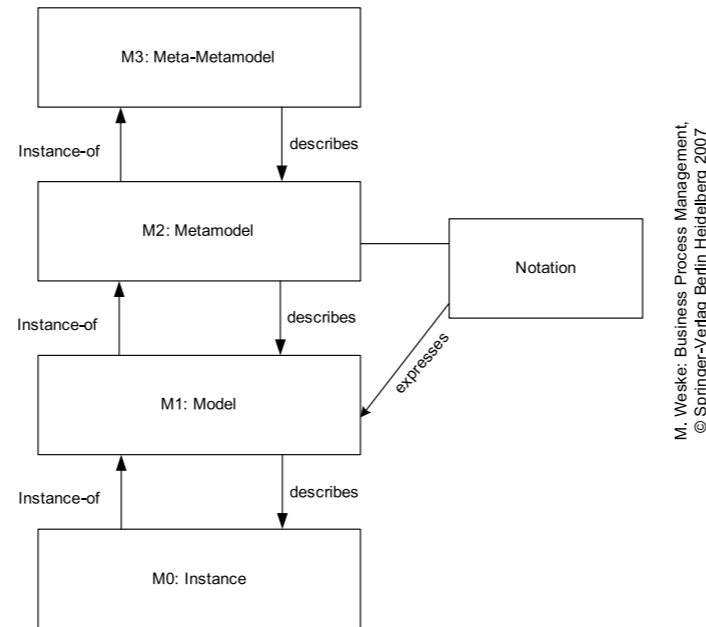
Roberto Bruni

<http://www.di.unipi.it/~bruni>

06 - Models and Abstraction



# Object

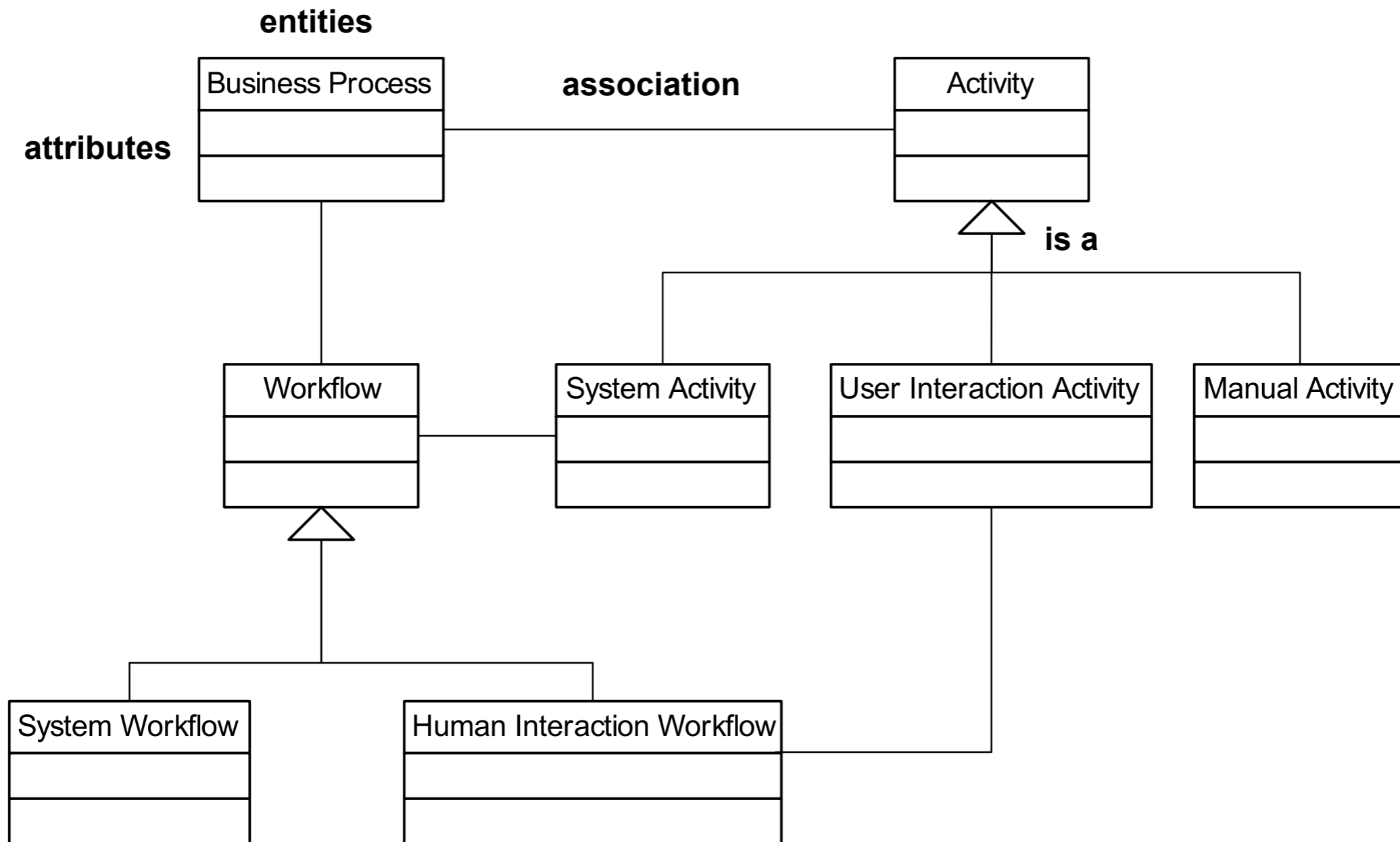


Overview of the conceptual models  
and abstraction mechanisms  
in business process modeling

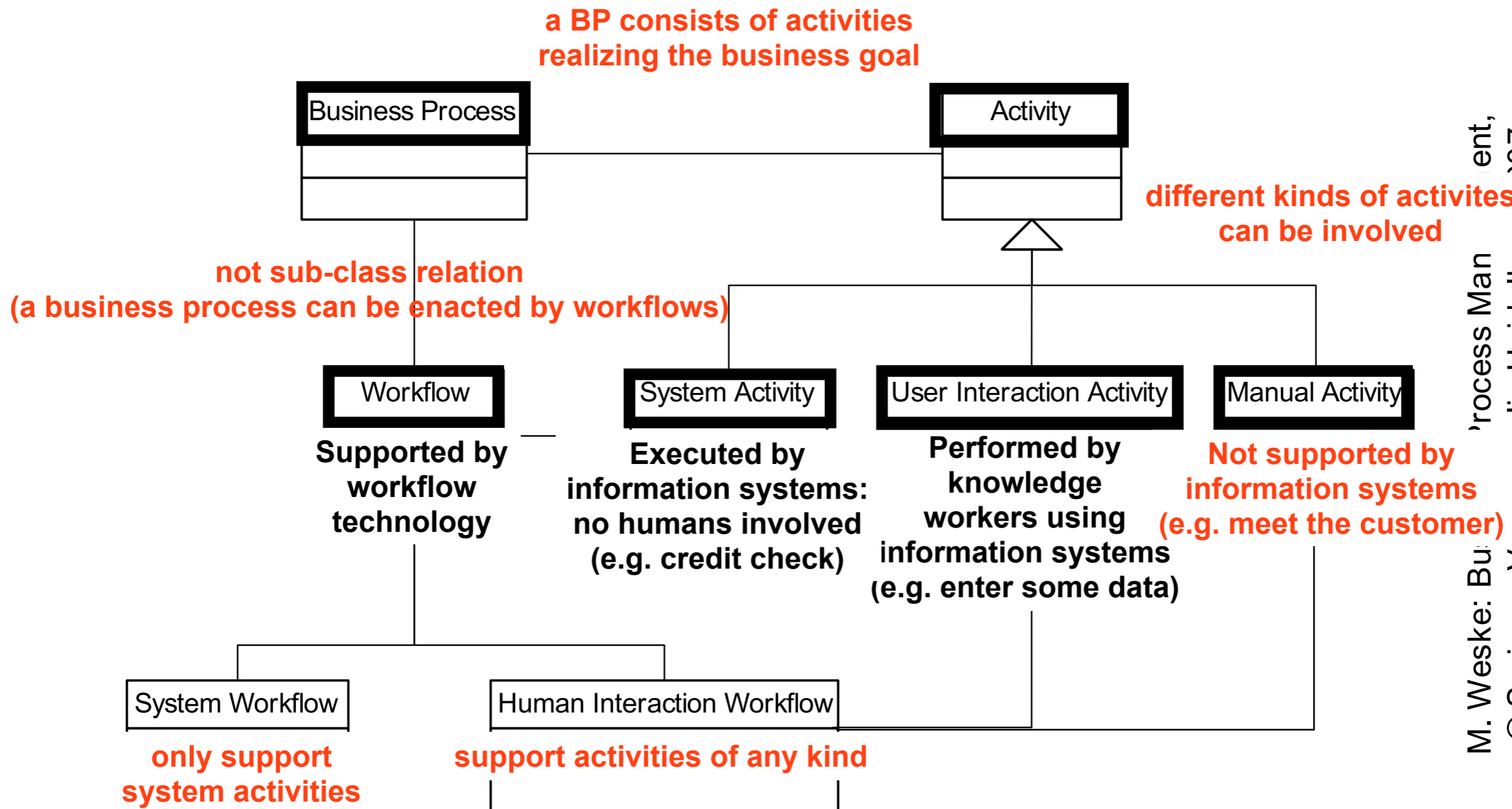
# Model

A model is a simplified representation of reality

# Conceptual model of business processes



# Conceptual model of business processes



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UML-like syntax

# Abstraction

To derive general rules and concepts from specific examples of some phenomenon, by selecting only the aspects which are relevant for a particular purpose

A mean to cope with complexity

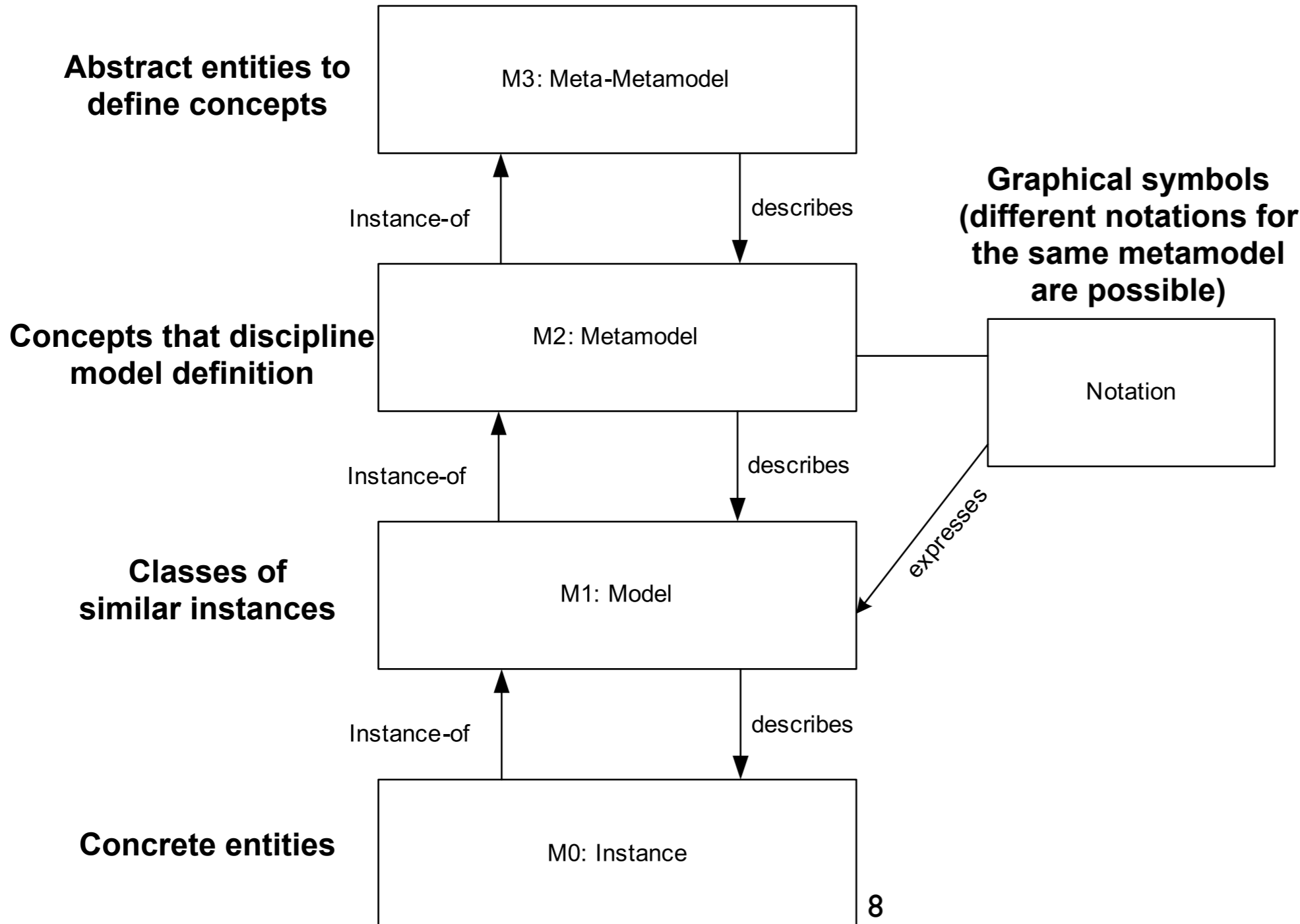
# Abstractions

**Horizontal:** separation at different modeling levels

**Vertical:** separation at different subdomains

**Aggregation:** separation at different granularity levels

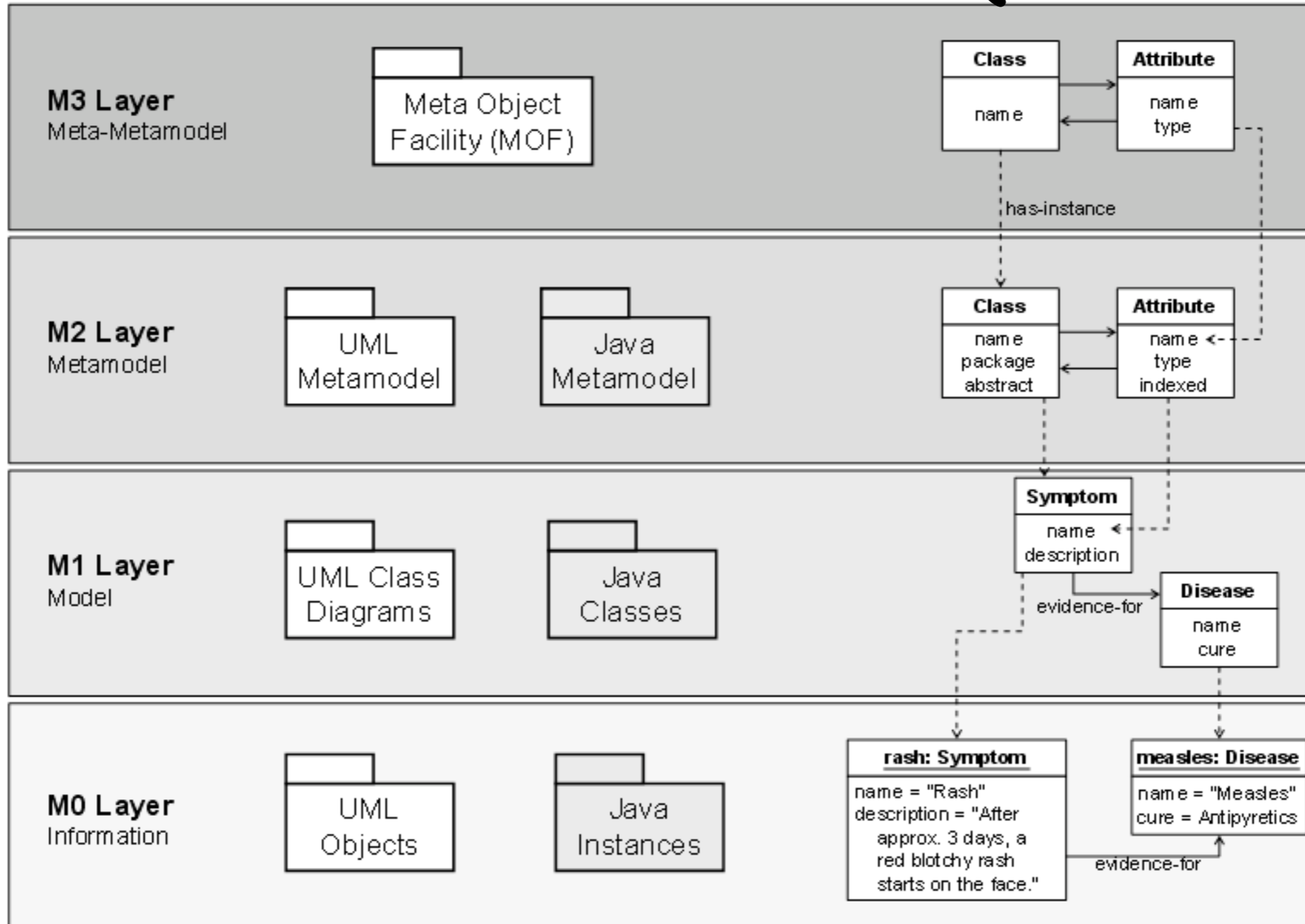
# Horizontal abstraction (modeling levels)



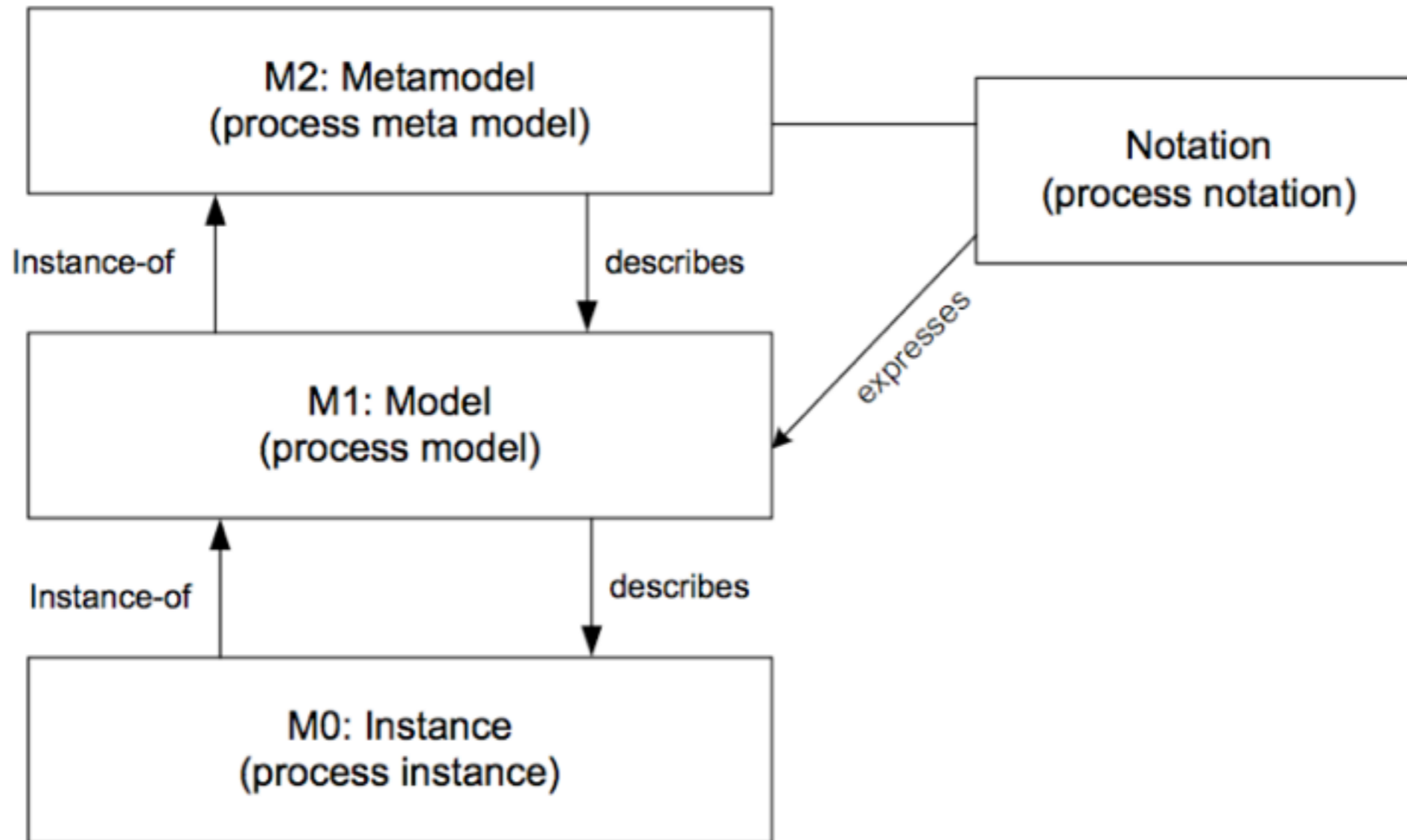
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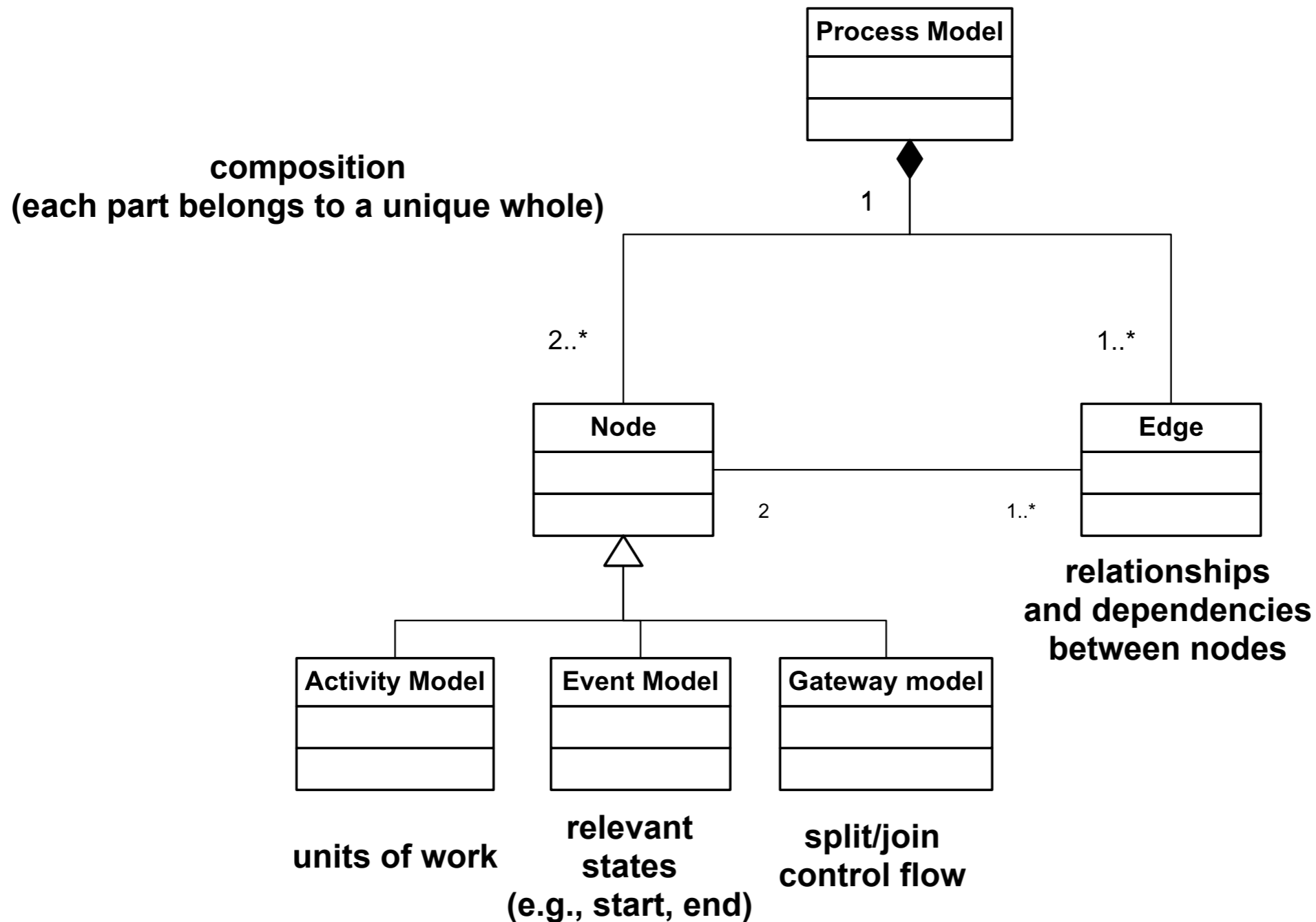
# An example: MOF metamodel (OMG)



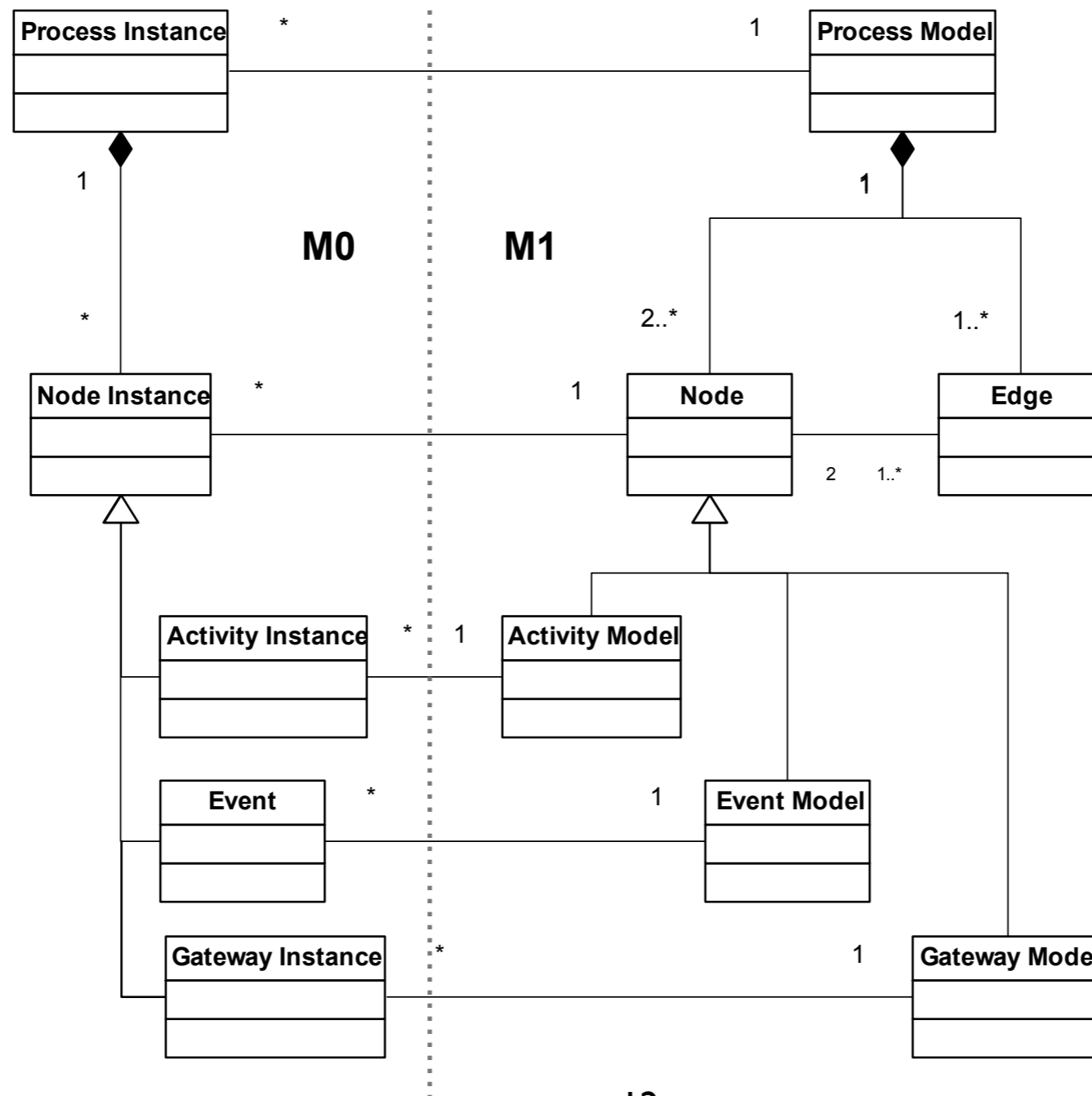
# Process models and process instances



# A process metamodel (level M2)



# Process models and process instances



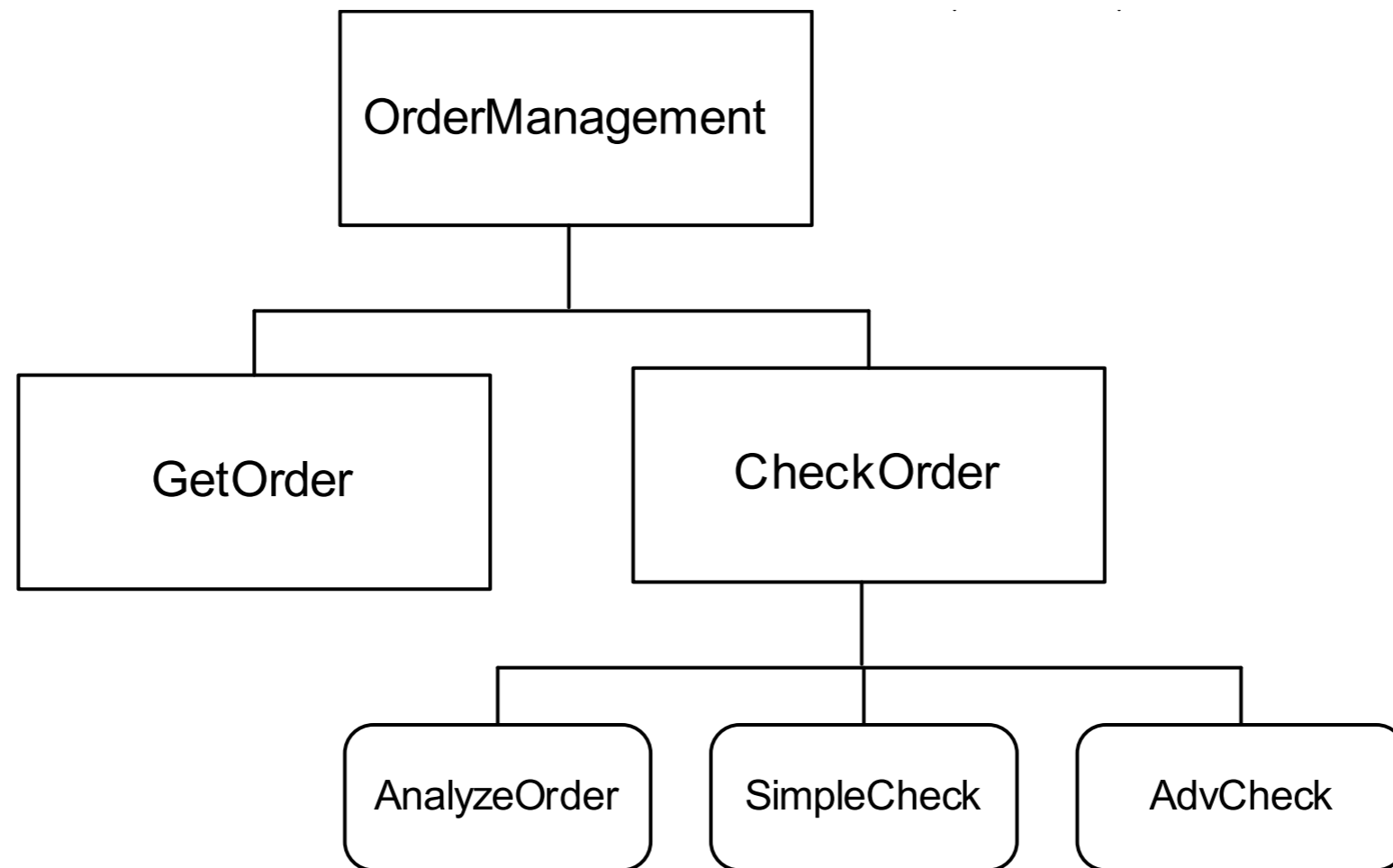
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# Aggregation abstraction

Multiple elements of a lower level of granularity can be grouped and represented by a single artifact at the higher level of granularity

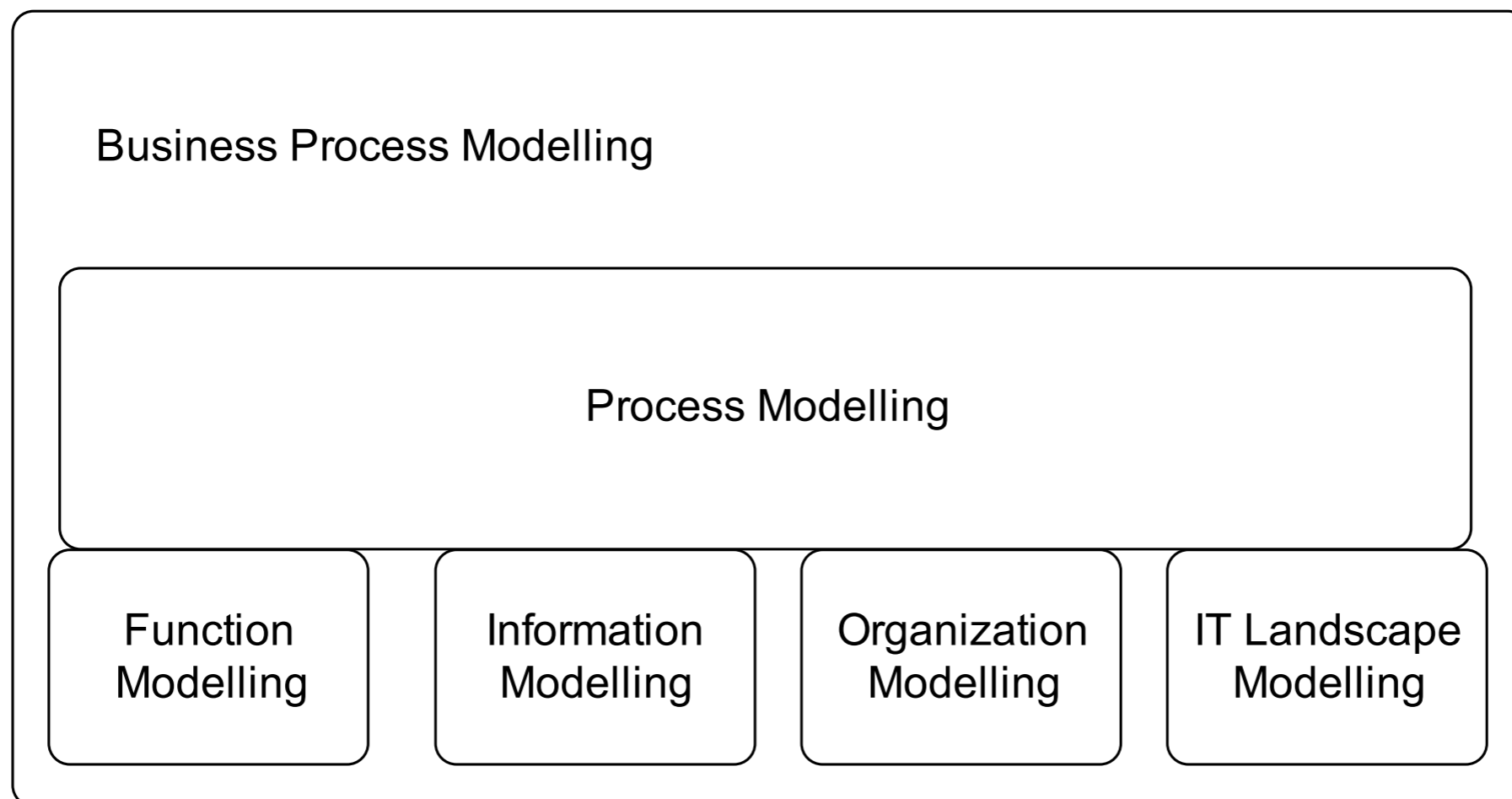
Different from horizontal abstraction:  
all activities lie at the same level of abstraction

# A sample aggregation



# Vertical abstraction (domain separation)

BPM includes multiple modelling domains,  
integrated by Process Modelling

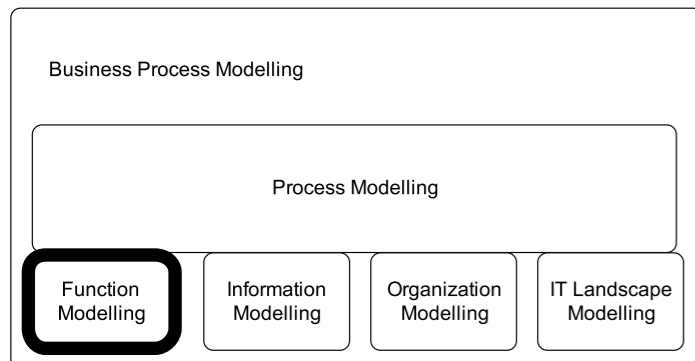


# Function models

Units of work enacted by processes  
(at different levels of granularity)

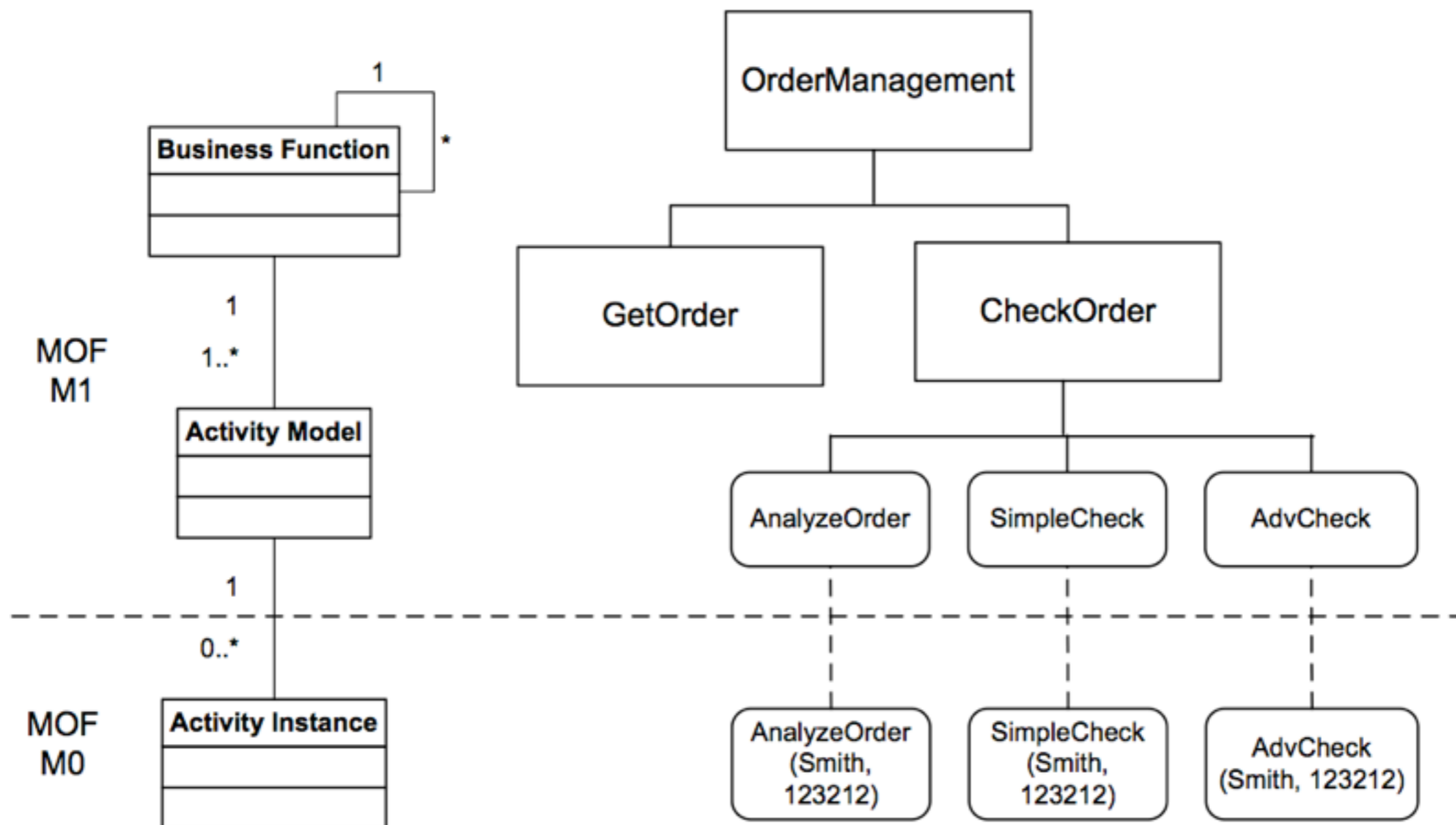
Informal description, textual documents  
(coarse-grain business level)

Formal description, function specifications  
(fine-grain software layer)





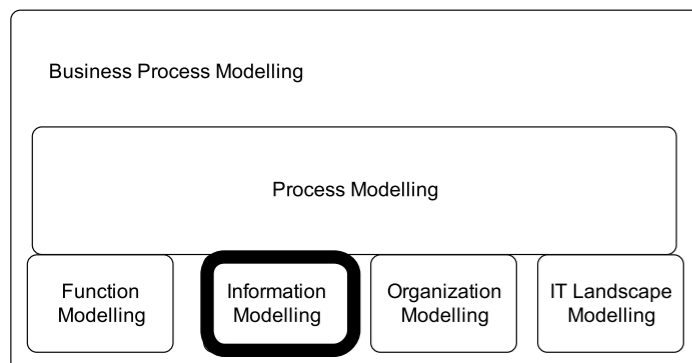
# Activity models and activity instances



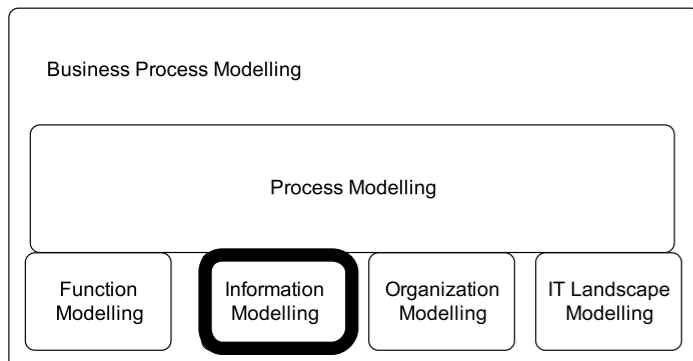
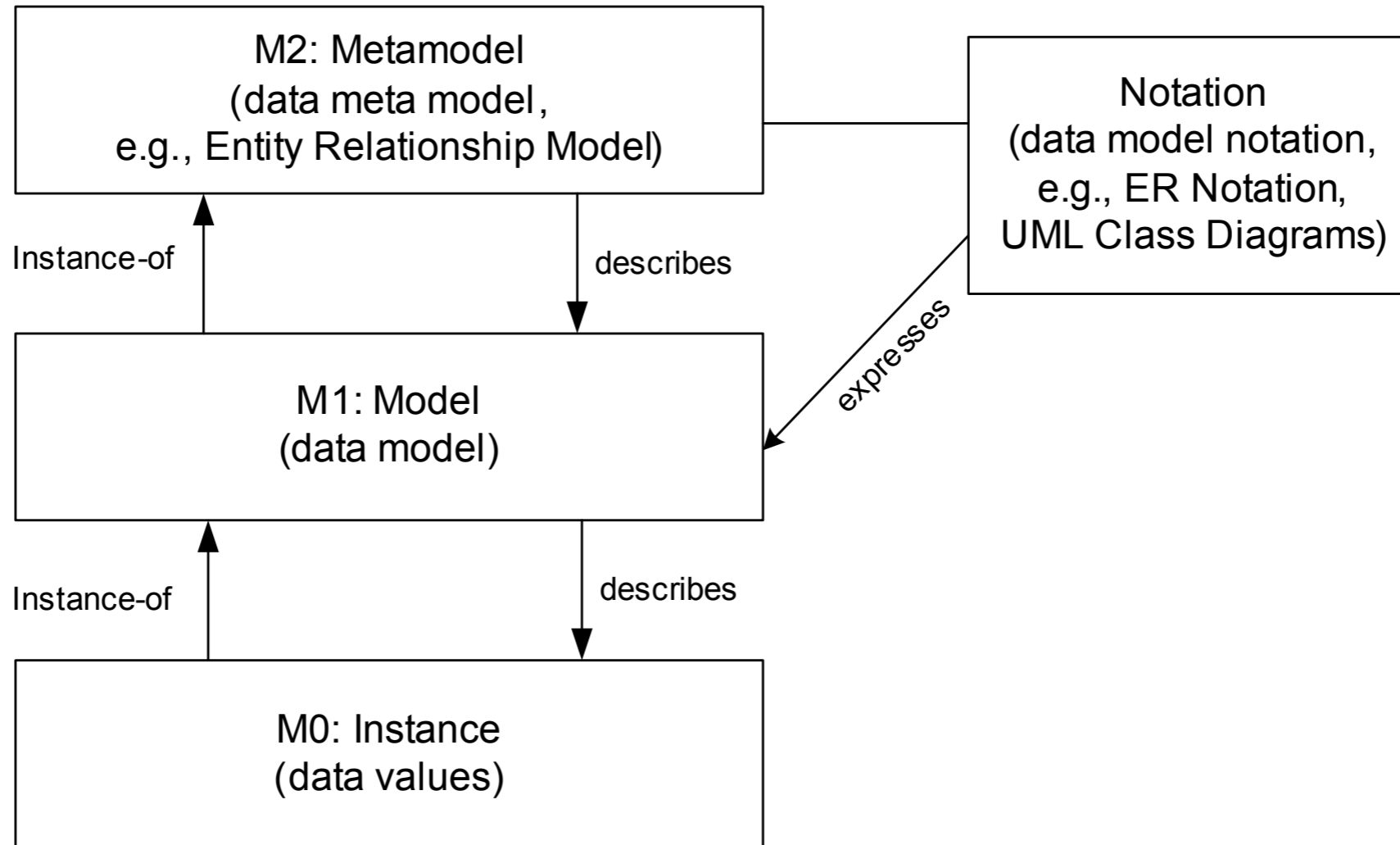
# Information models

Data representation is crucial:  
all decisions made during a business process  
depends on data values

Data dependencies between activities  
are also important  
(ensure data-availability, reduce waiting time)



# Data models

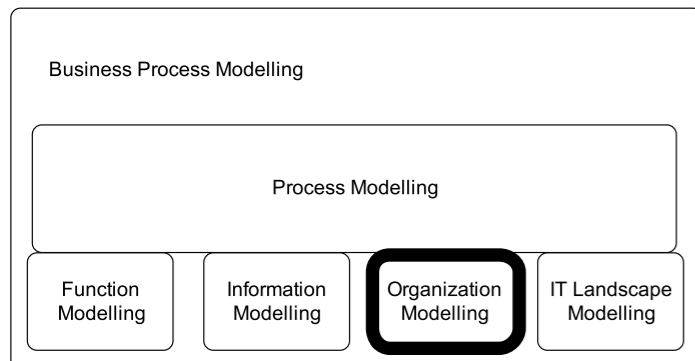


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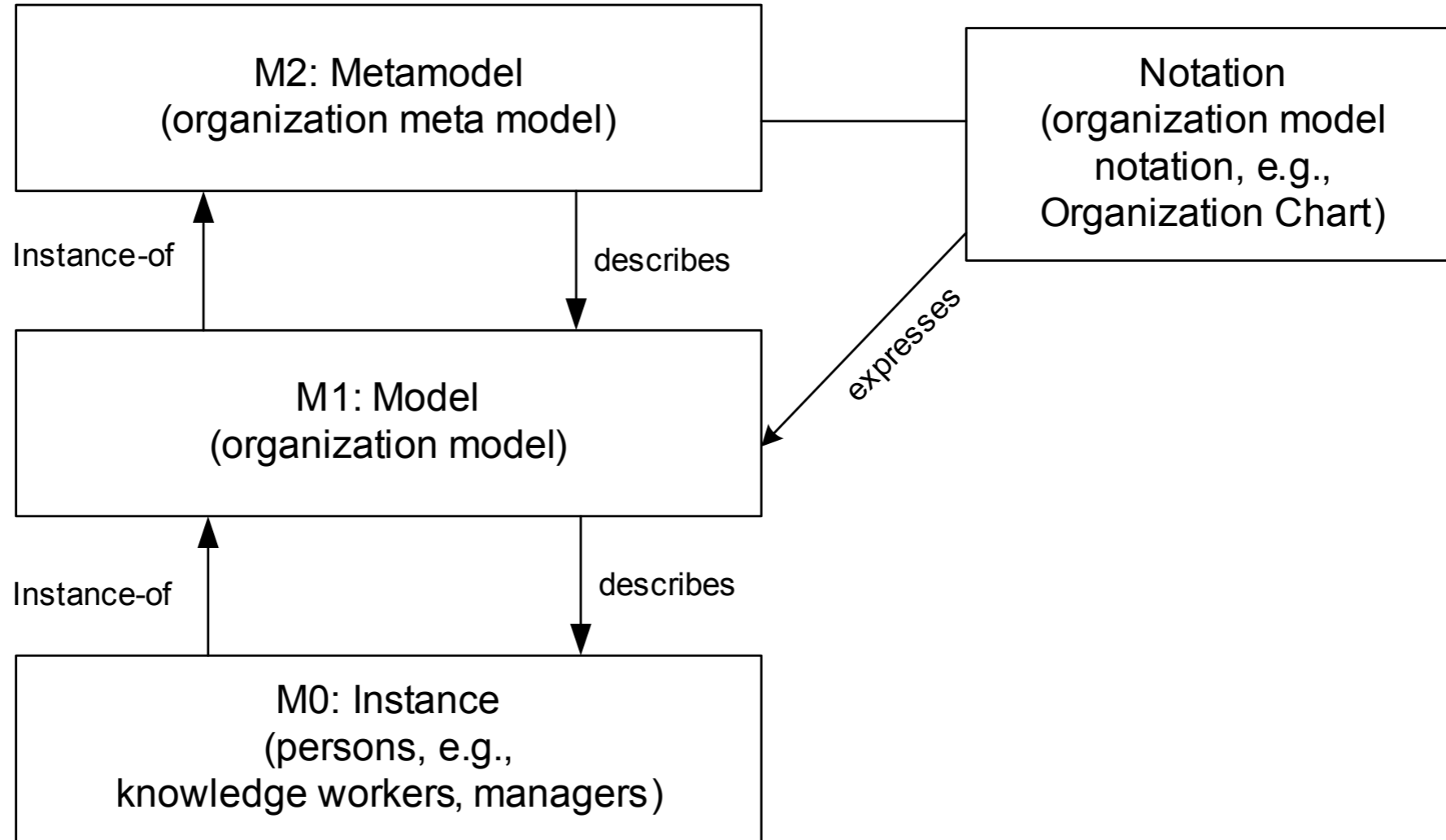
# Organizational models

Organizational structure must be represented

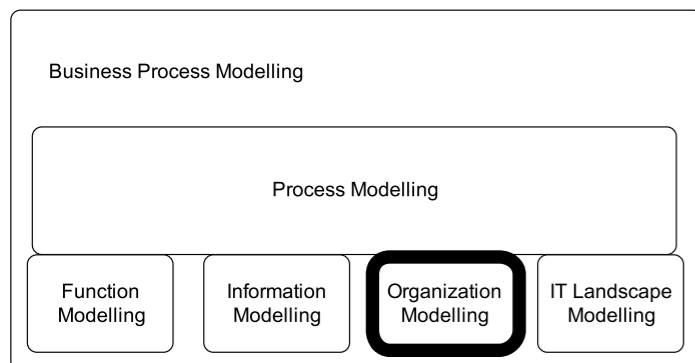
Activities must be associated  
to specific roles or departments



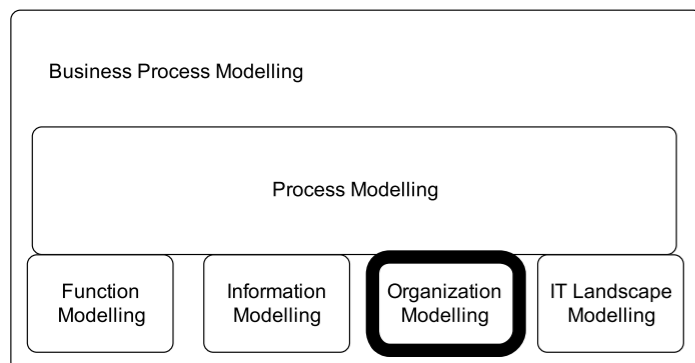
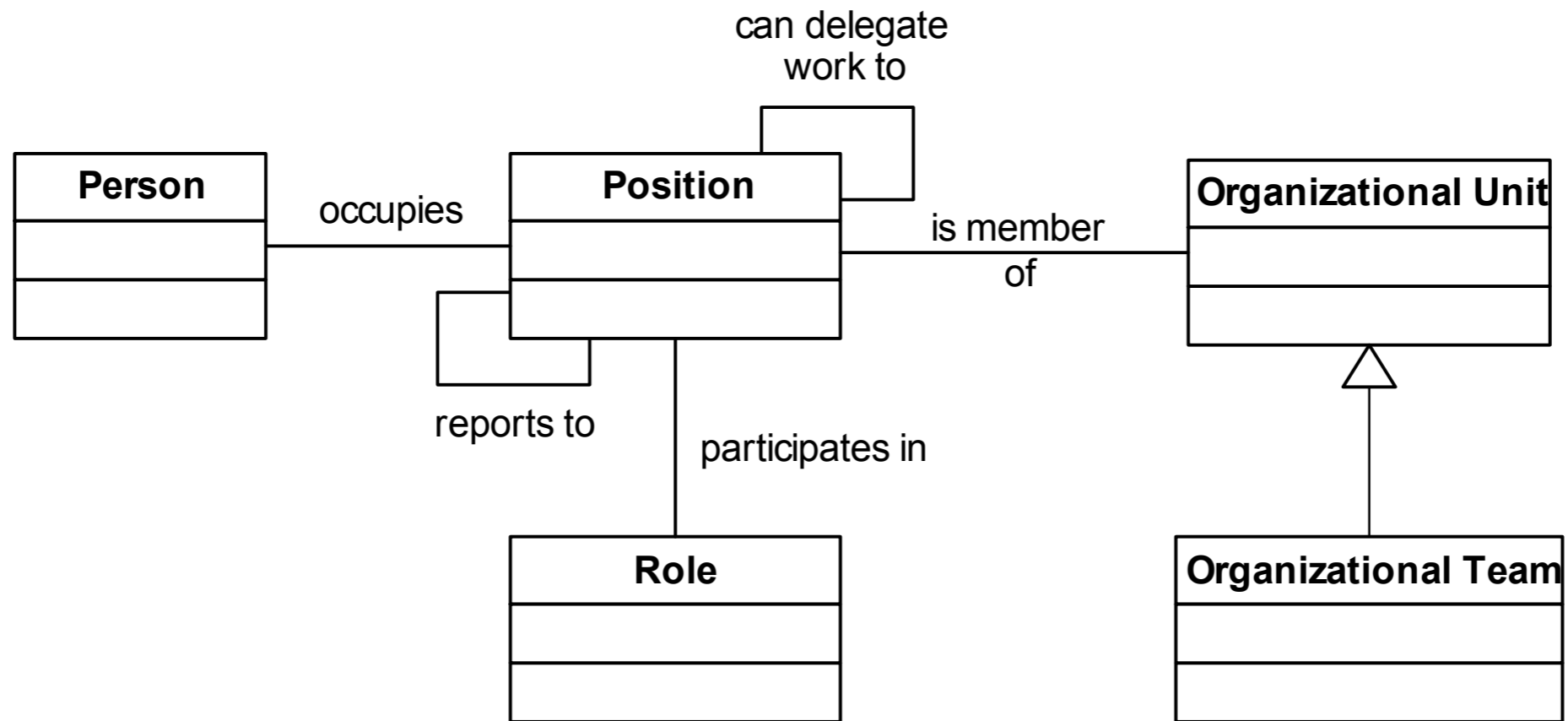
# Organizational models



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# An organizational metamodel

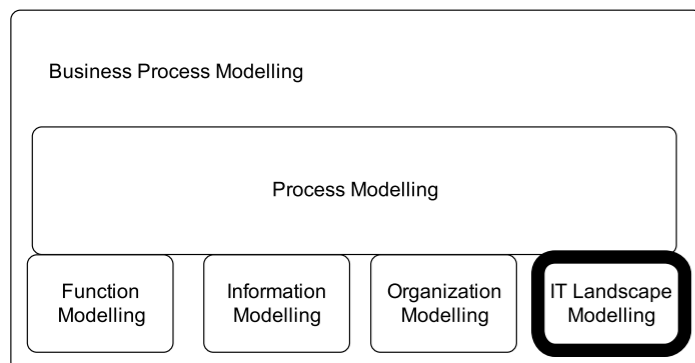


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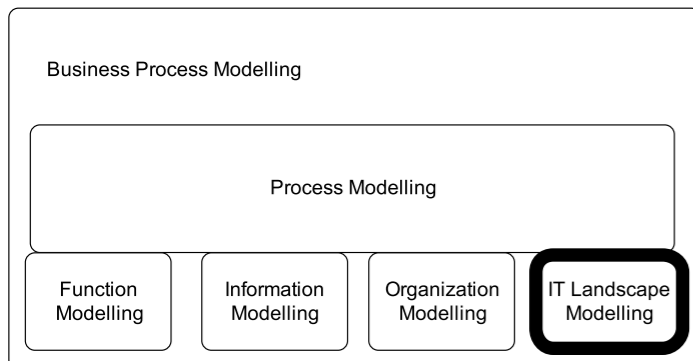
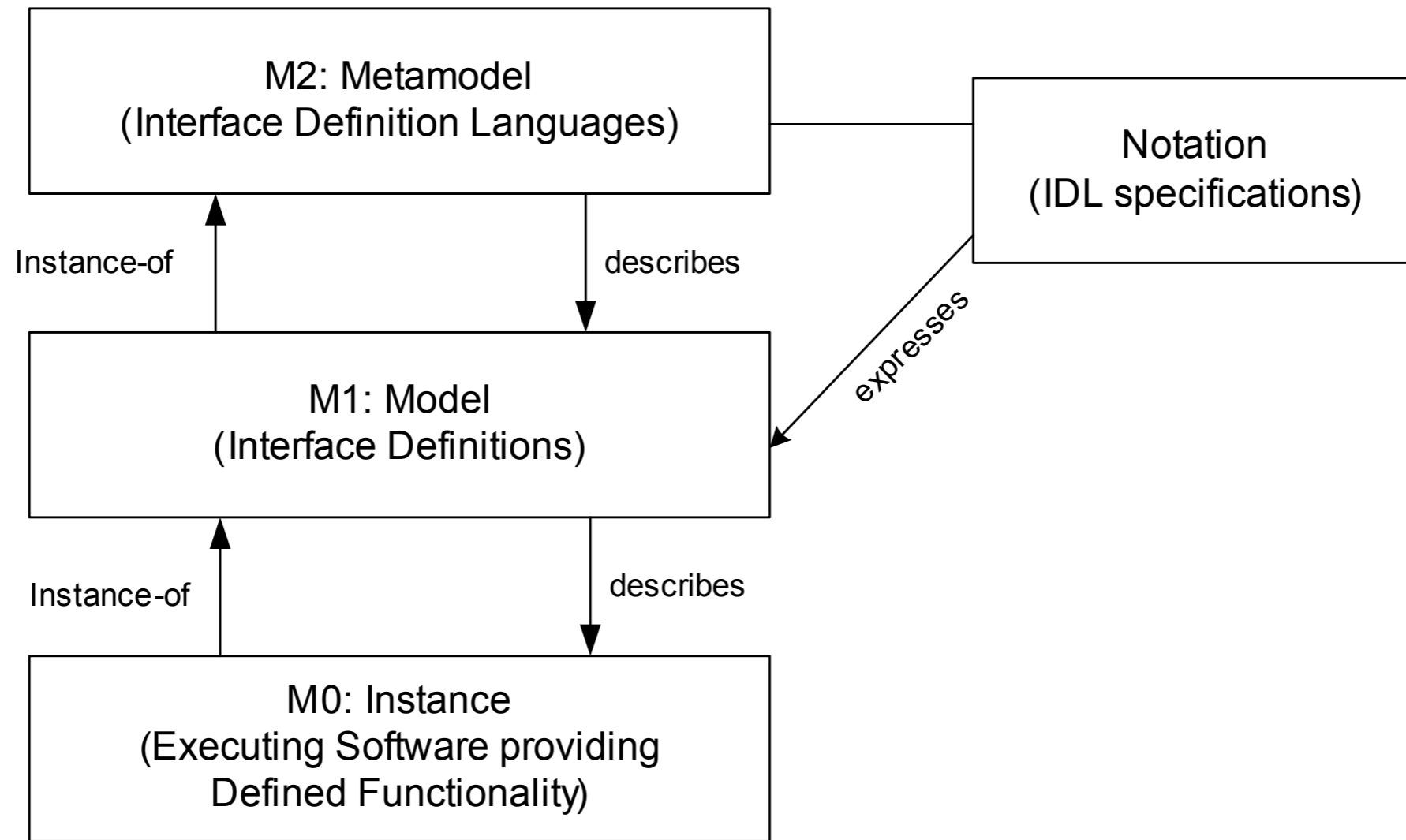
# IT landscape

Many activities in a business process are supported by information systems

Information systems and programming interfaces needs to be represented because they provide functionalities



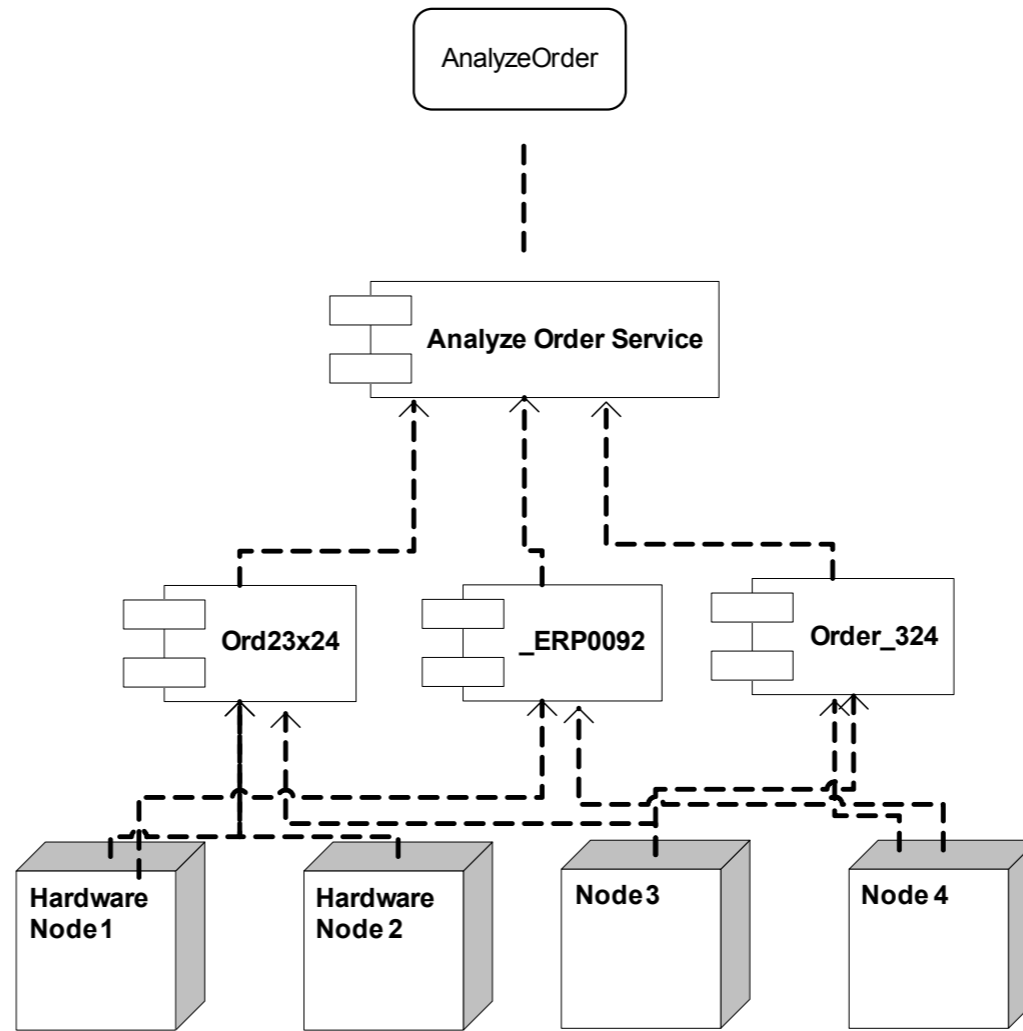
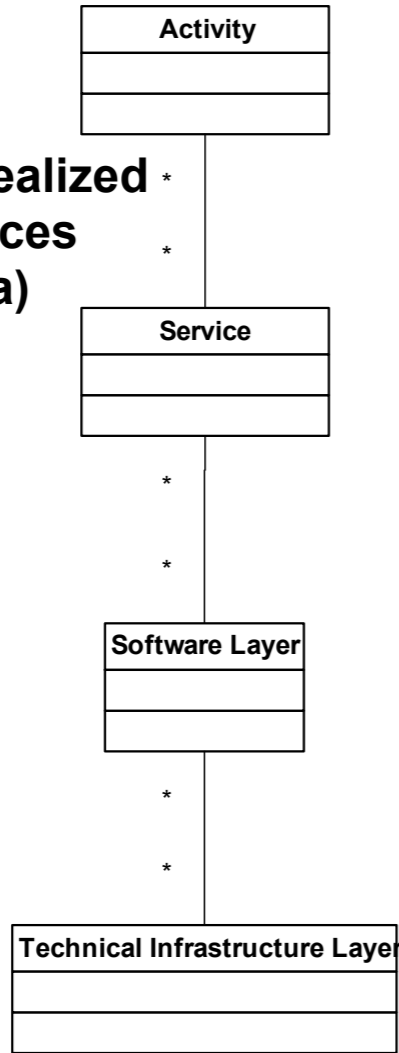
# IDL



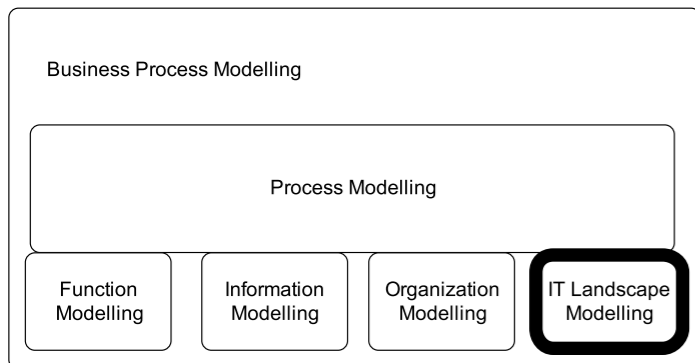


# Service enabling

An activity can be realized \*  
by multiple services  
(and vice versa)



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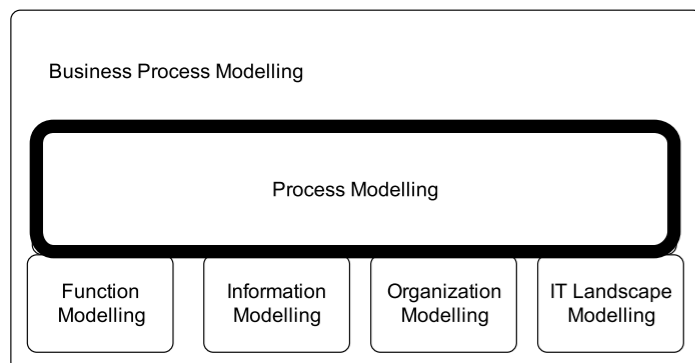


# Process models

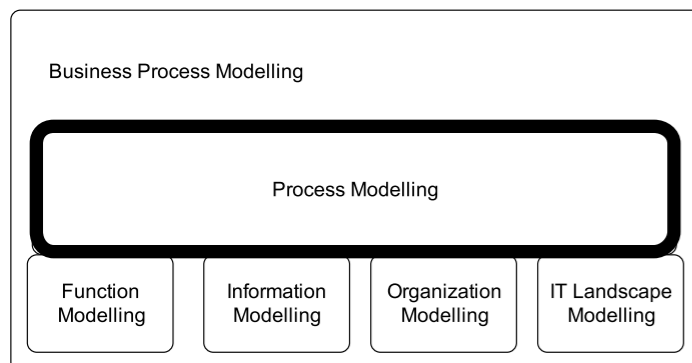
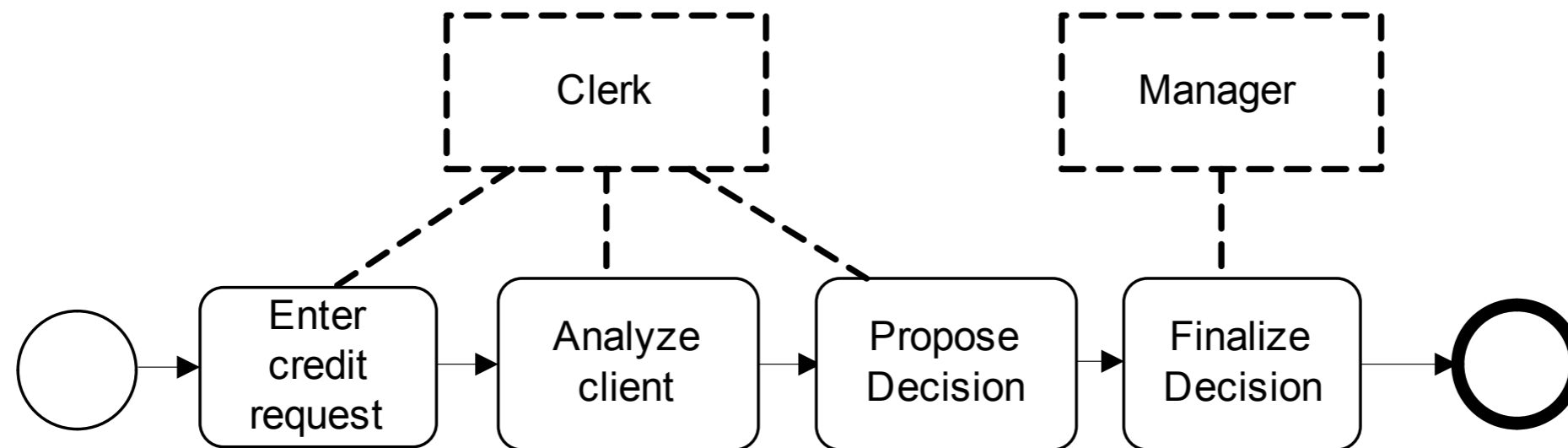
Define the glue between the subdomains

Relate functions and execution constraints

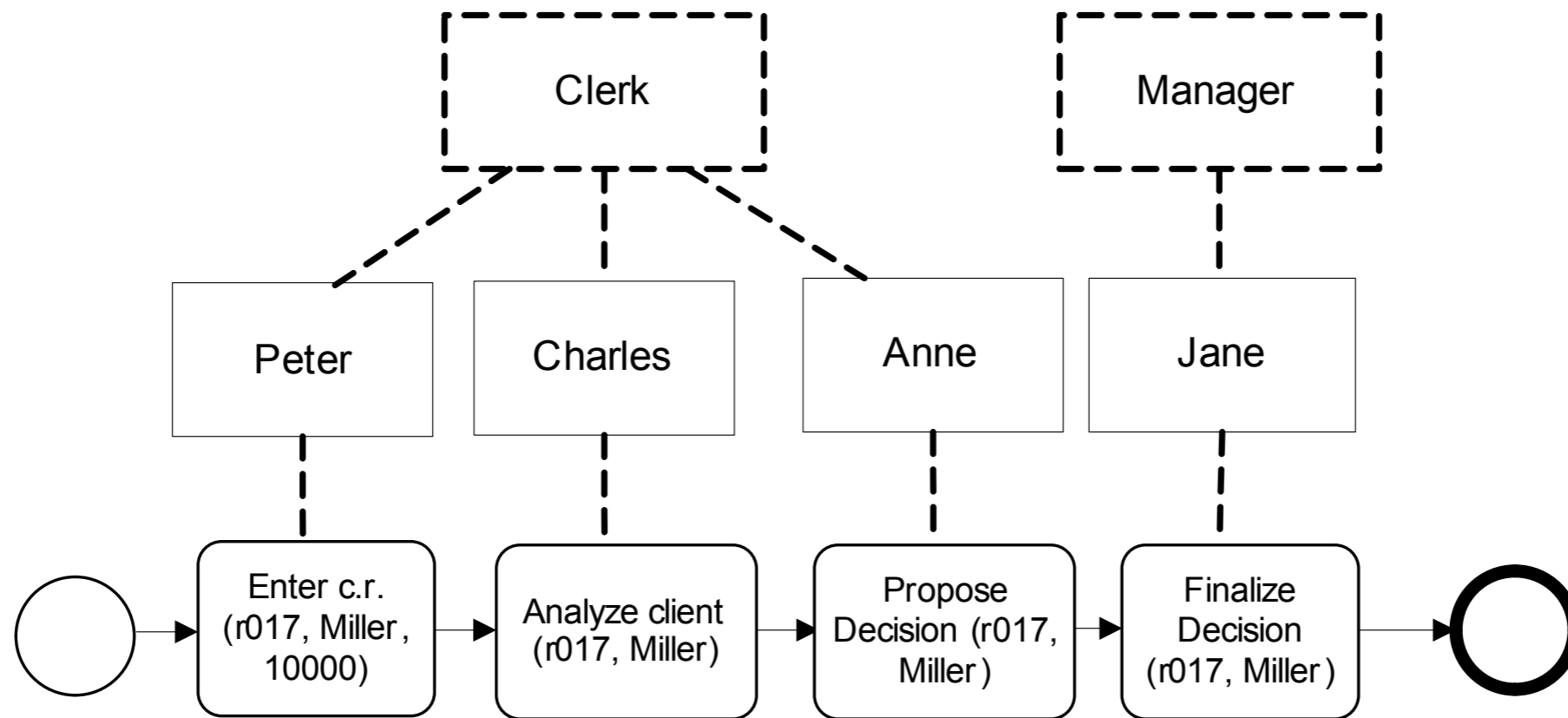
Relate data values with process instances  
(e.g. the process of a credit approval may depend on the requested amount)



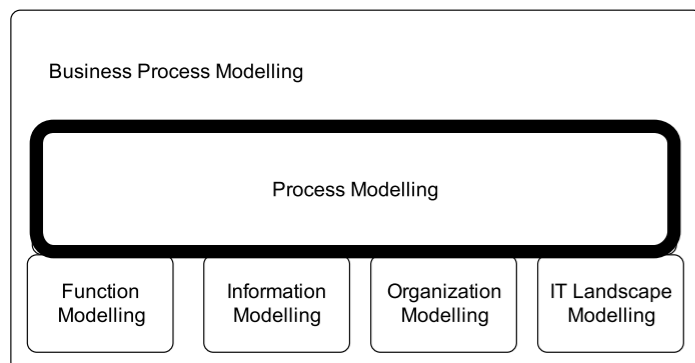
# A process model with role information



# A process instance with workers information

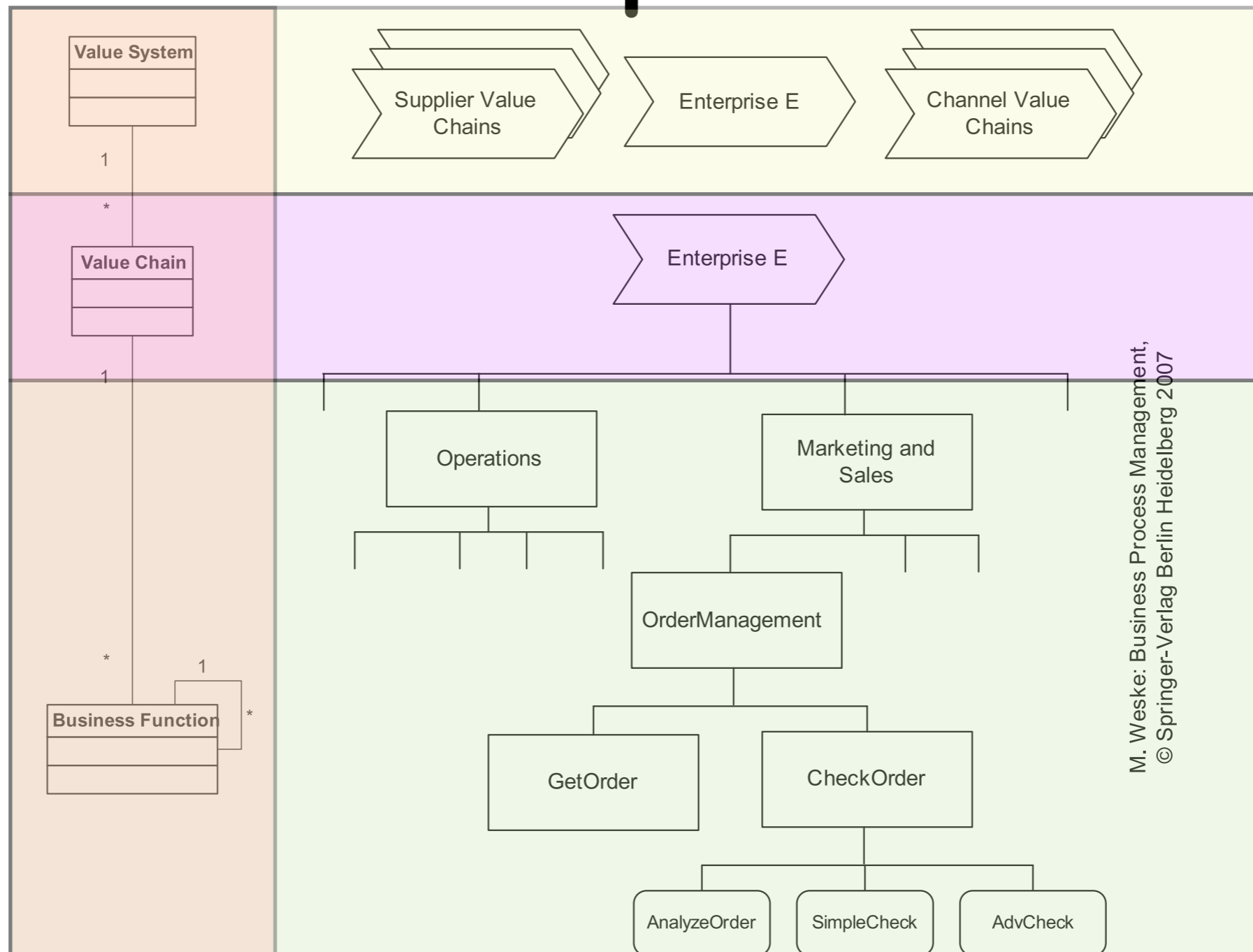


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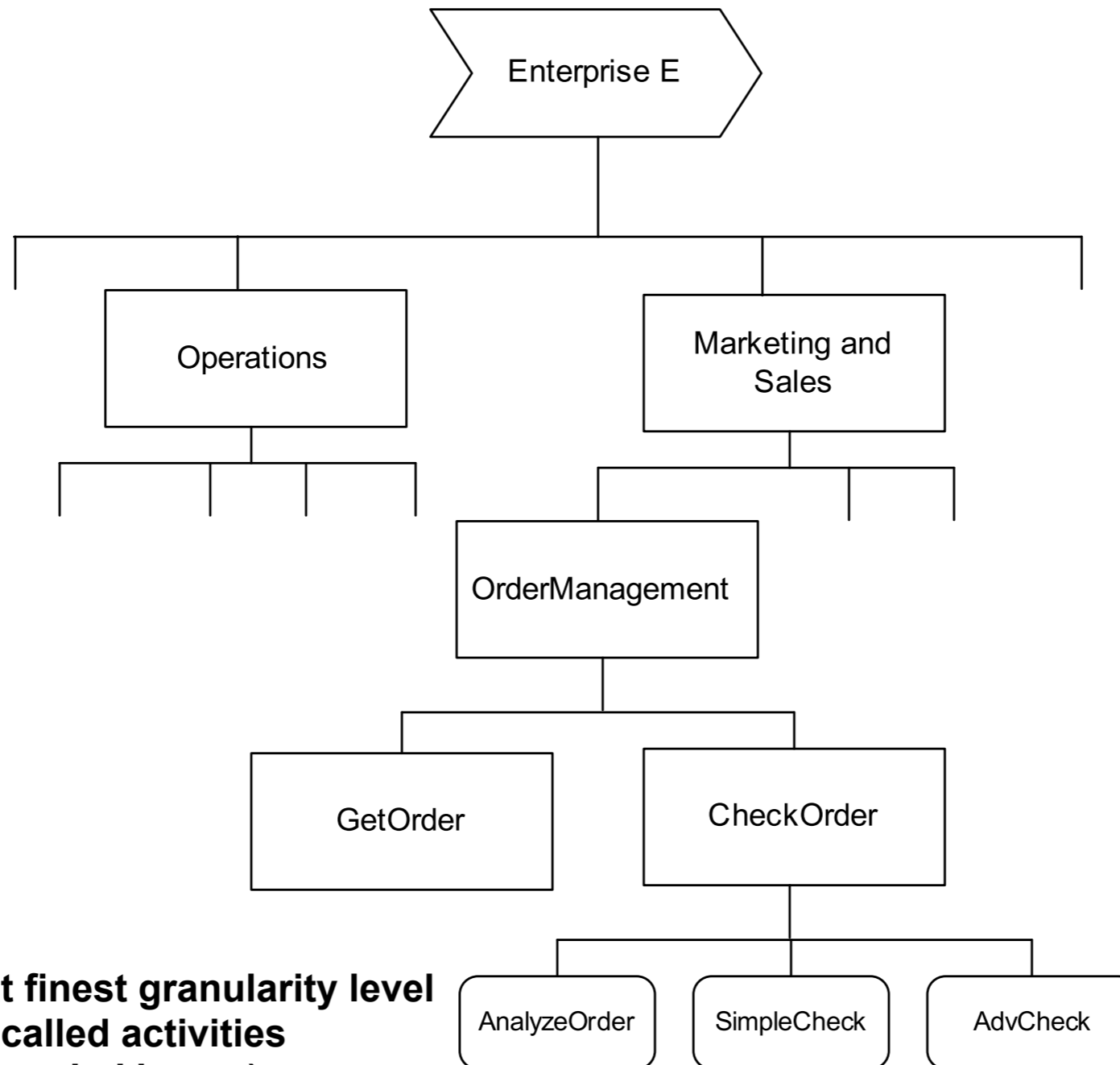
From business functions  
to business processes  
(and their implementation)

# Step 1: Functional decomposition



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# Business functions and activities

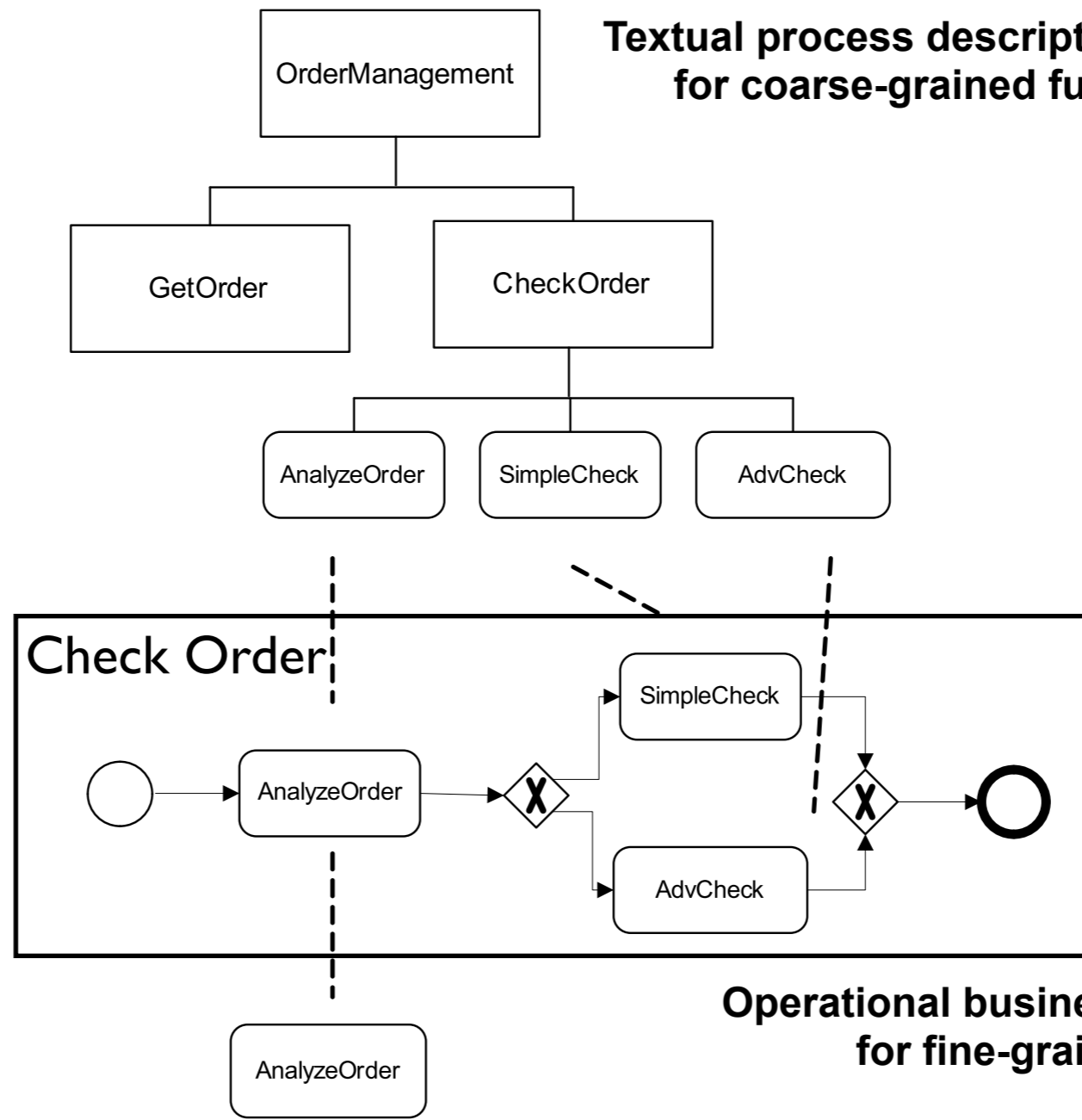
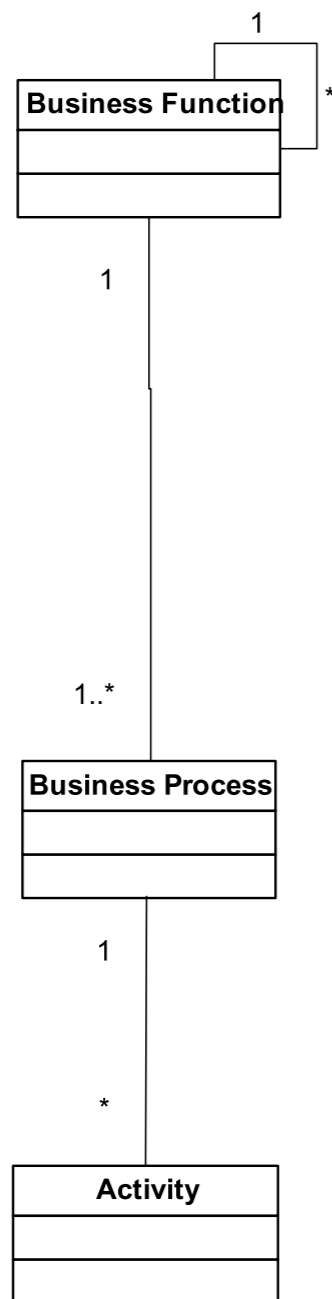


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**Functions at finest granularity level  
are called activities  
(rounded boxes)**

# Step 2: Structuring business processes

Fix execution constraints



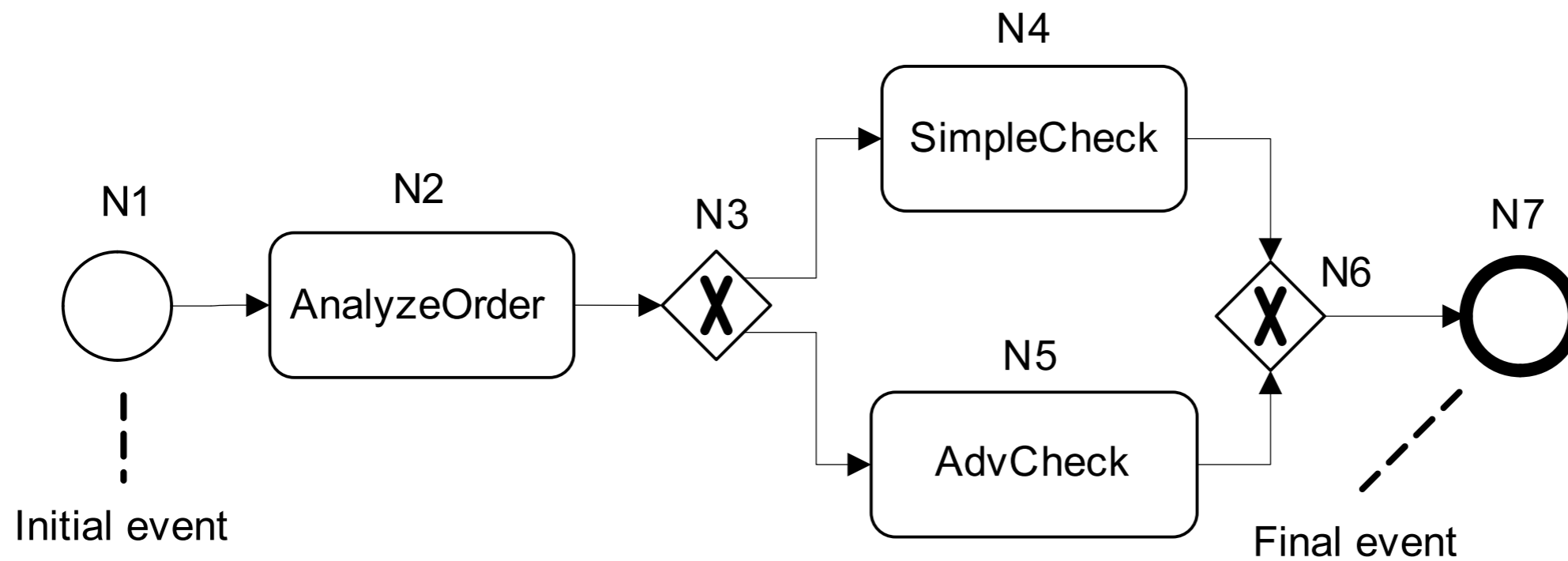
Textual process descriptions are ok for coarse-grained functions

Operational business processes are ok for fine-grained functions

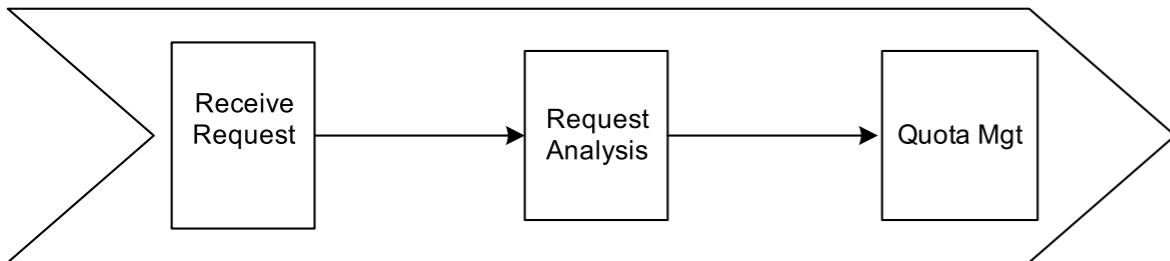
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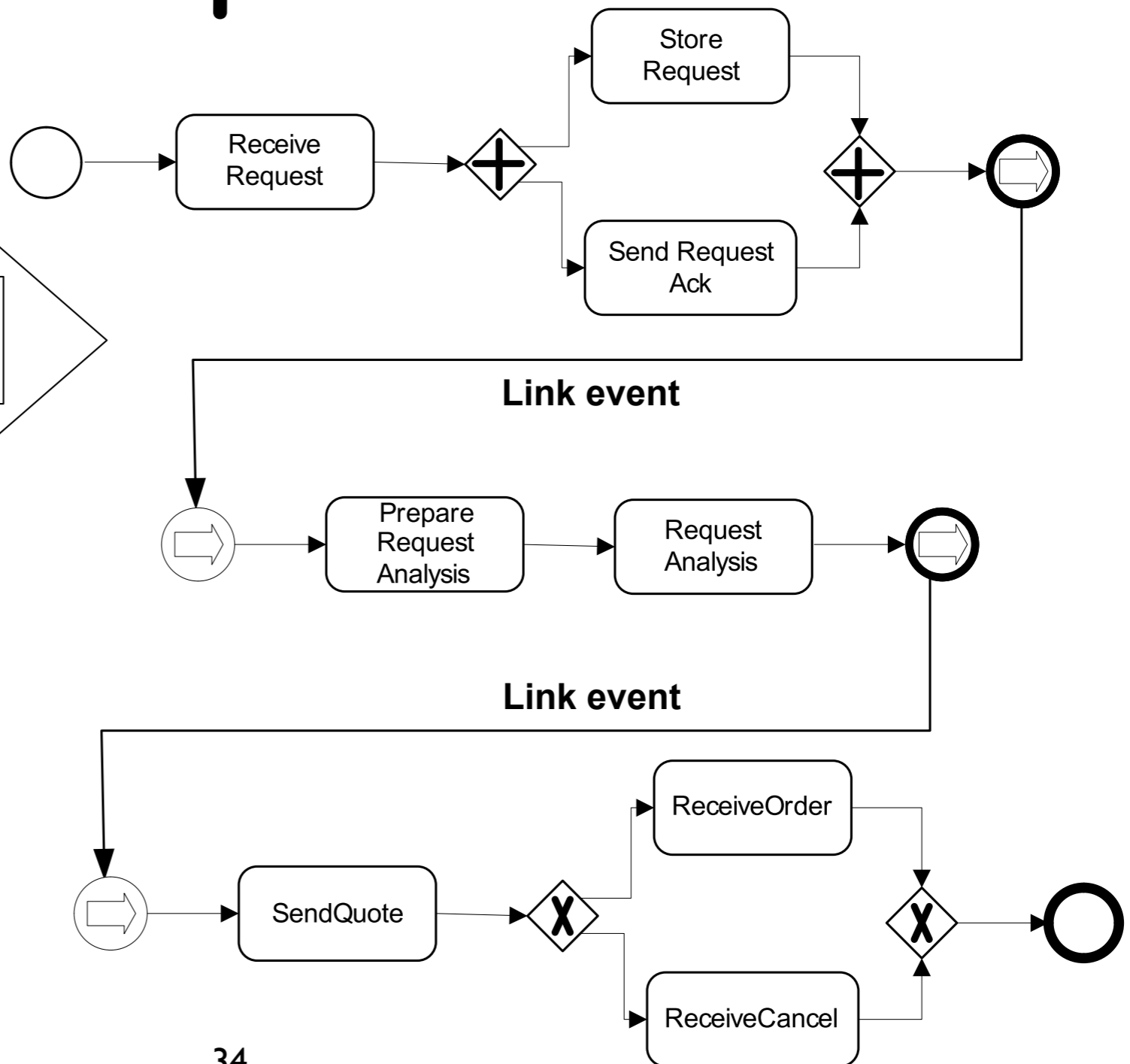
# Start event / End event



# Step 3: Related business processes



Value chain with related, high level functions

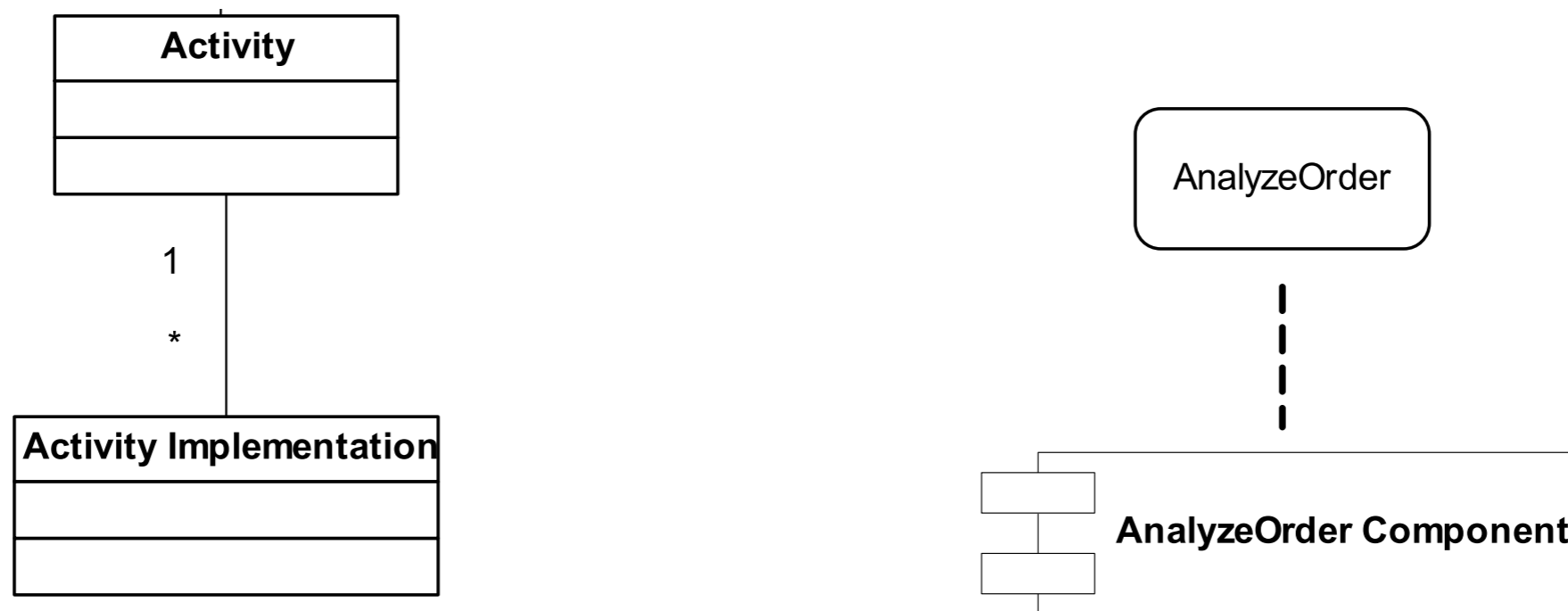


Link event

Link event

One end event of one process can trigger the start event of another process

# Step 4: Activity implementation

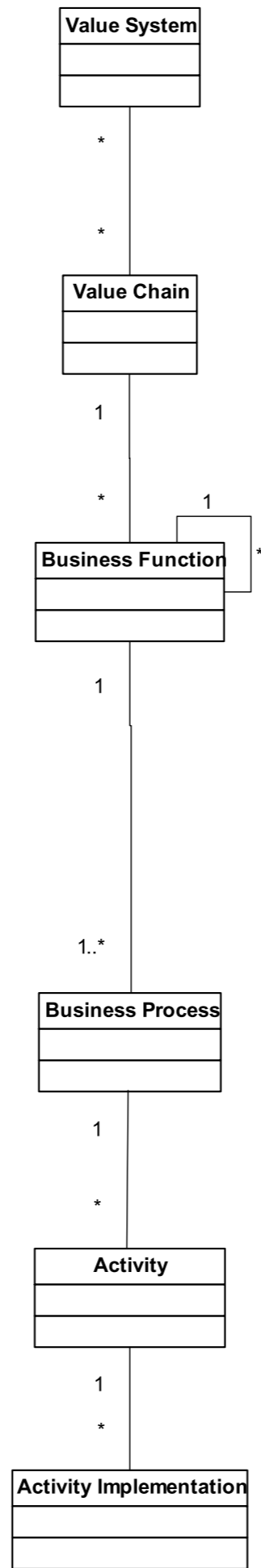


**Activities are functions of the finest granularity**

**They are the building blocks of operational business processes  
(but sometimes activity implementation can be provided by knowledge worker)**

# From value system

...



...

# to implementation

