DIAMOND-PATH FRAMEWORK

Outline

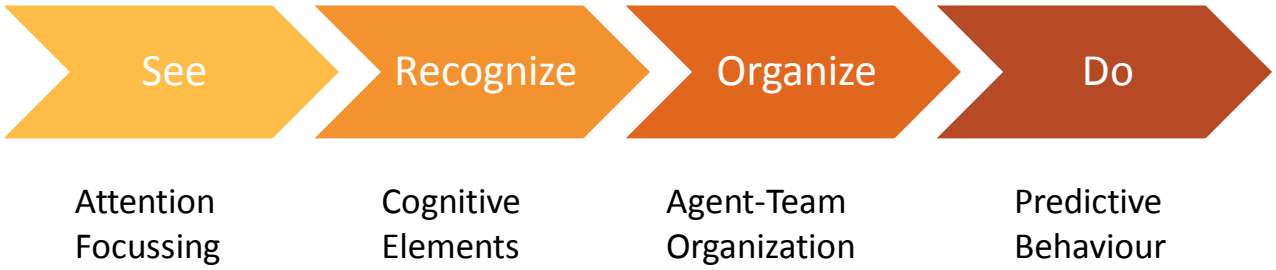
- Introduction
  - Presentation aims
  - Motivation
- Service Systems Reference Model
  - Organization
  - Predictive behaviour
- Universal modelling
  - Meta-modelling
  - Context-specific classification
- See – Recognize – Organize – Do
- Reflexion
  - Usability
  - Follow-up Efforts

Presentation Aims

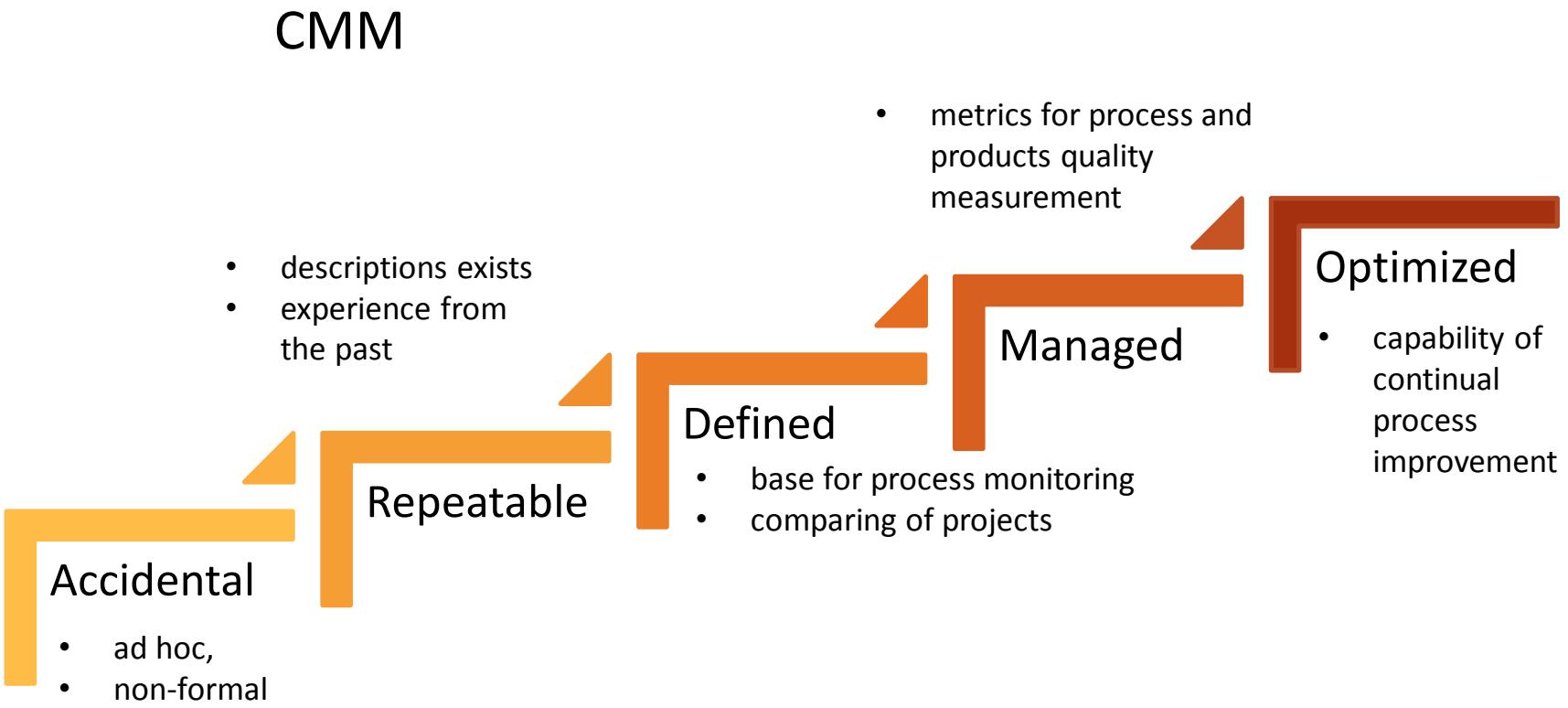
- Introduce Diamond-Path Framework as is
- Initiate a discourse on usefulness
- Show current follow-up efforts, state-of-the-art

Diamond-Path Framework
What is it?

- Paradigm aimed to help understand and act in a service-system environment
- Theoretical concept
- 4 diamond-shaped models



Universal modelling



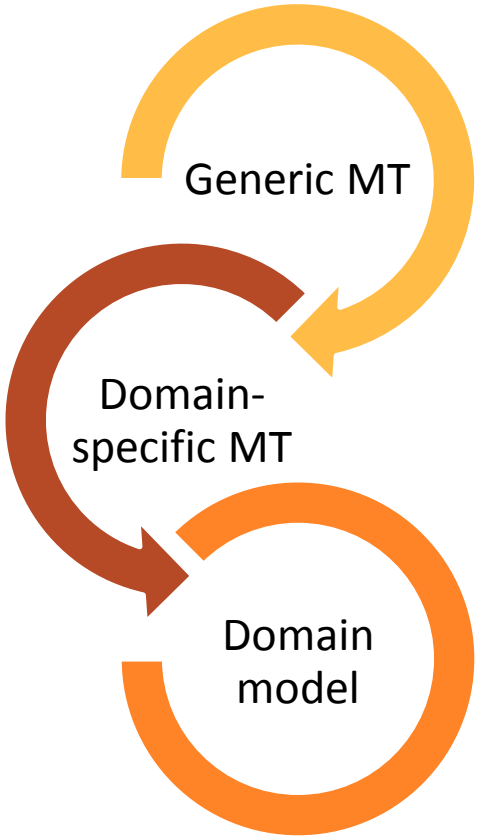
How long does it take for regular ISs to adjust in order to support newly optimized processes?

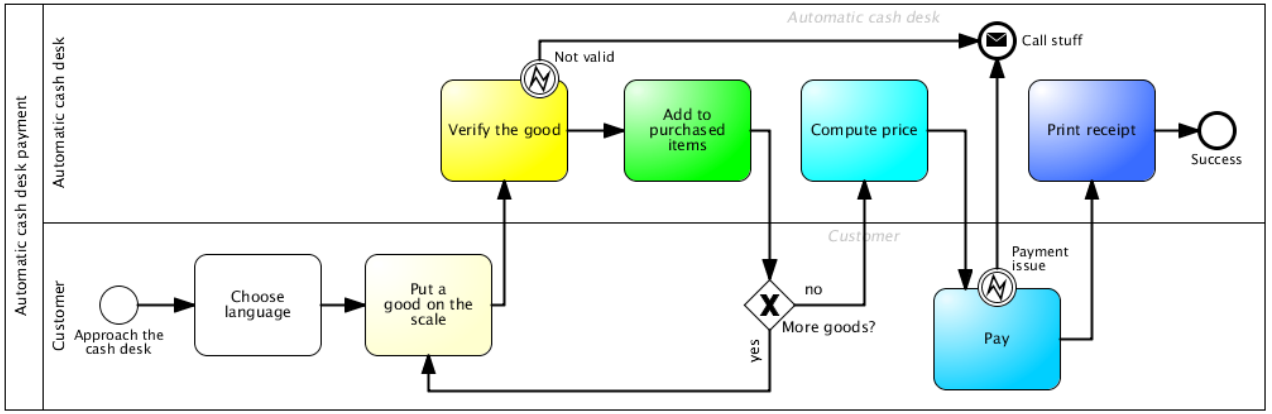
Current Modelling Tools

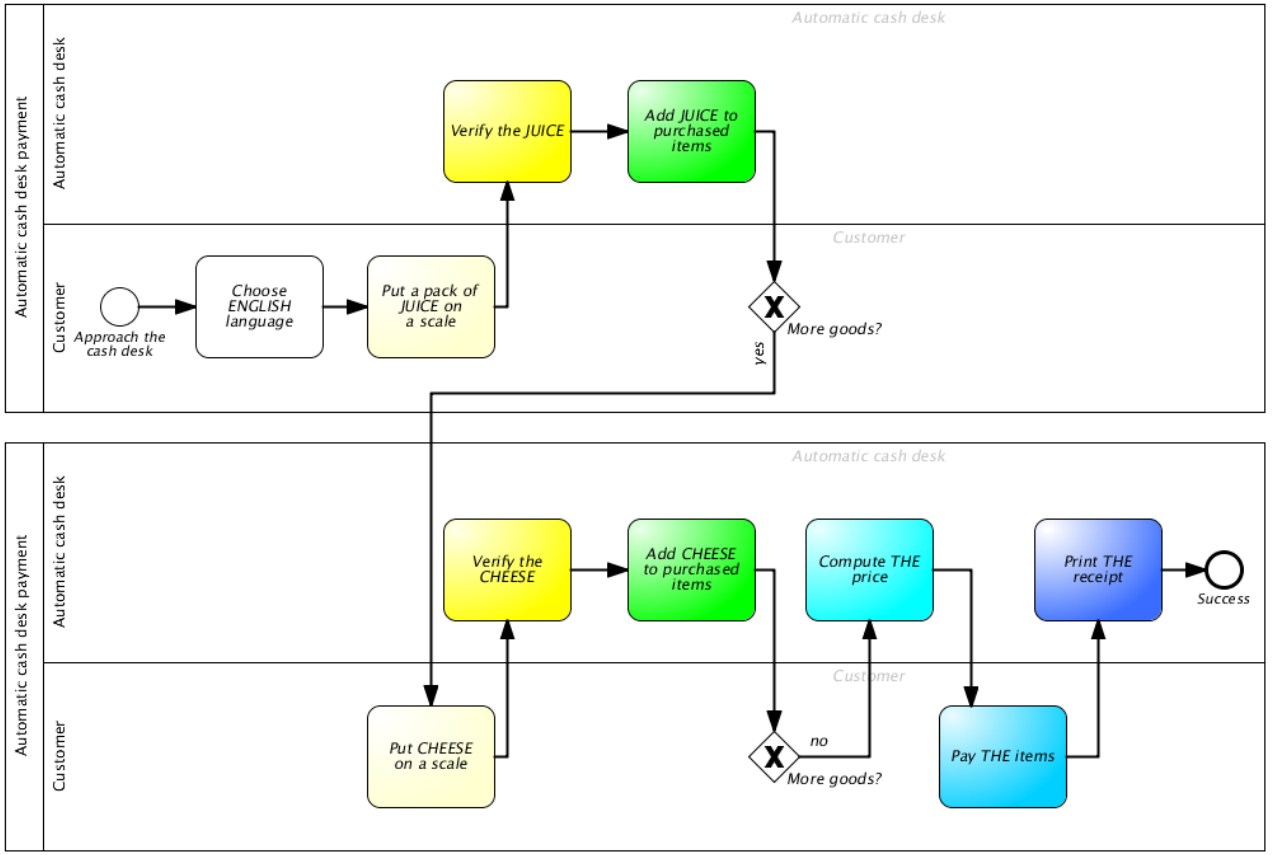
1. Current CASE tools, BPMT, PMT, … allow to record only such objects and relationships, which had their creators in **minds** in the time when they were developing the tool.
2. Objects and relationships, we focus on when modeling various aspects of business, are **continually changing**.
3. Problem of effective communication within any IT project lies nearly always **on boundaries of capability** of a given modeling tool (… thus the model doesn't represent the reality appropriately)
4. Except of some isolated cases, there are only **few ways to extend** used MT by constructs which are needed for current specific requirements.
5. A problem arises in **integration** of some partial views into one common view.

Meta-modelling

- Ability to develop and adjust domain-specific modelling tools
- Helps to construct the domain in terms comprehensible to domain experts
- Hierarchy of modelling tools




Automatic cash desk payment
Automatic cash desk
Customer
Automatic cash desk
Customer
Approach the cash desk
Choose language
Put a good on the scale
Verify the good
Not valid
Add to purchased items
Compute price
Call stuff
Print receipt
Success
Payment issue
Pay
no
More goods?
yes


Automatic cash desk payment
Automatic cash desk
Customer
Automatic cash desk
Customer
Automatic cash desk
Approach the cash desk
Choose ENGLISH language
Put a pack of JUICE on a scale
Verify the JUICE
Add JUICE to purchased items
More goods?
yes
Put CHEESE on a scale
Verify the CHEESE
Add CHEESE to purchased items
Compute THE price
Print THE receipt
Success
Pay THE items
no
More goods?

How do we model reality in our heads?

We identify...

Object -s

...we find interesting

SSME

Then, we find...

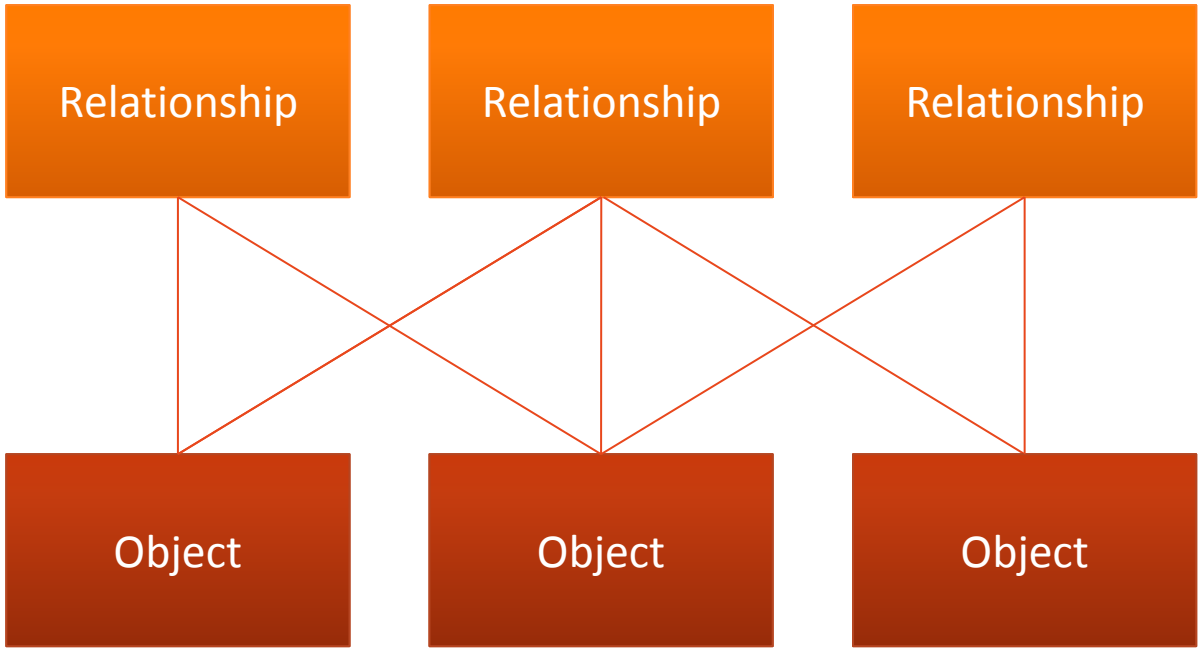
Relationship -s

...between our...

Object -s

SSME

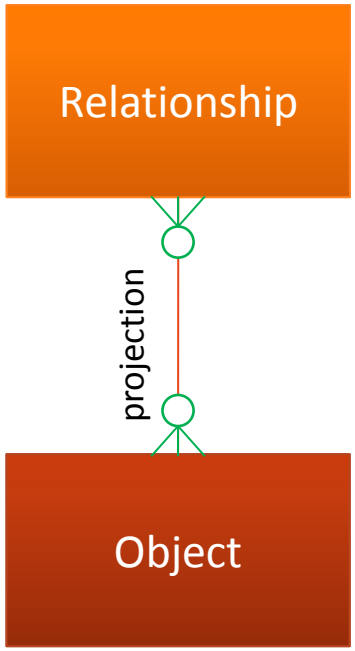
Each relationship can connect multiple objects...



...and each object can be present in multiple connections.

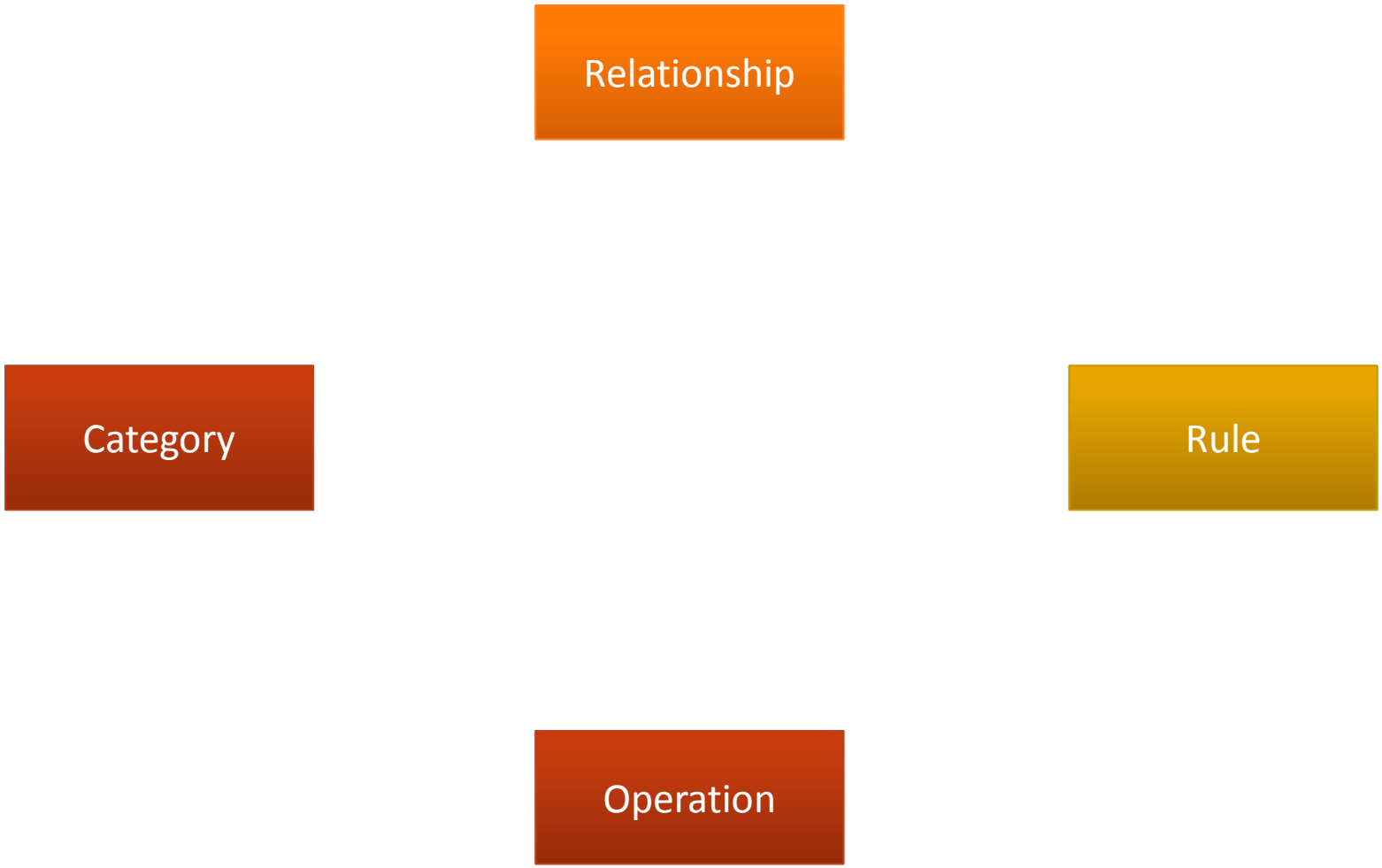
SSME

Each relationship can connect multiple objects...

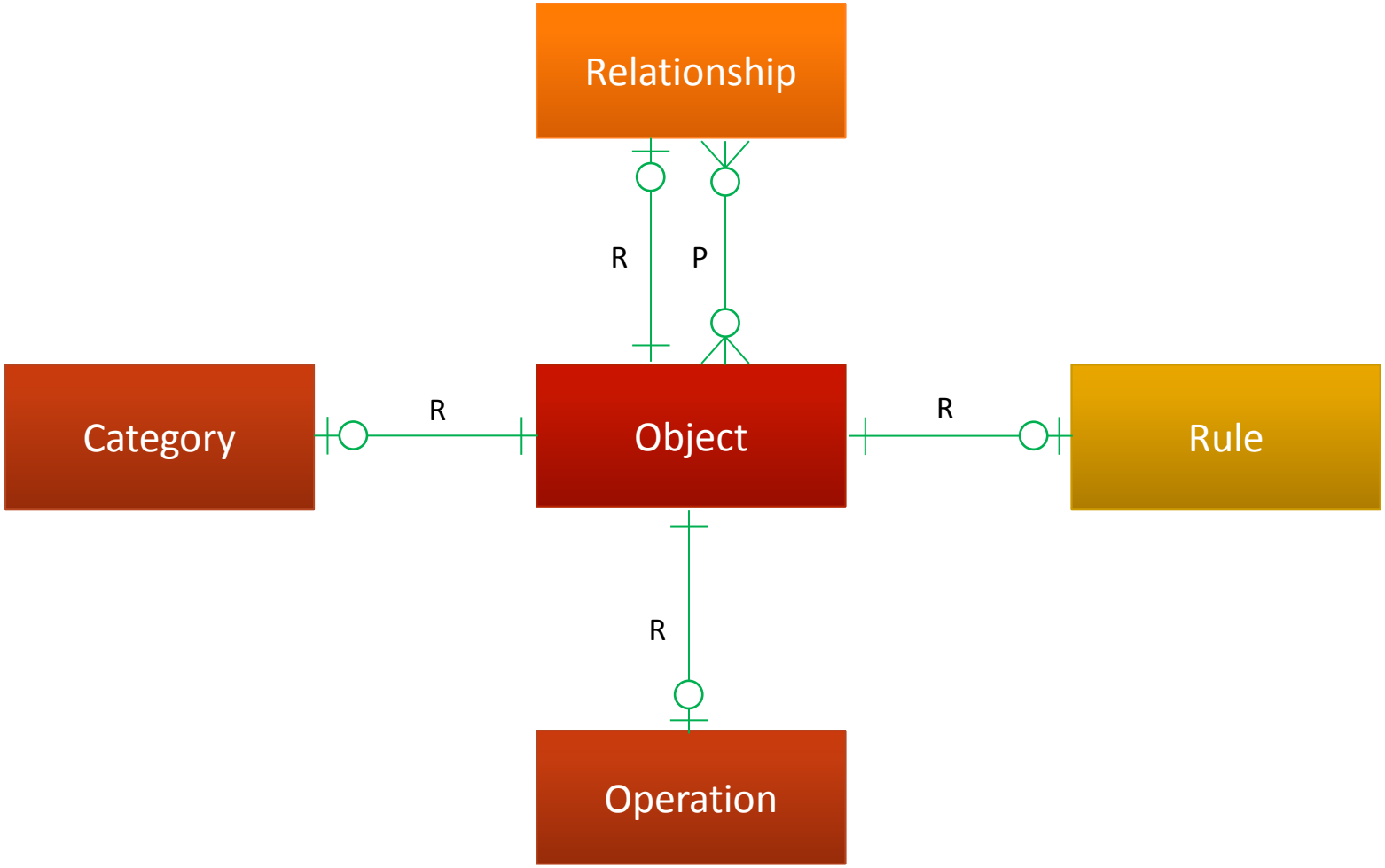


...and each object can be present in multiple connections.

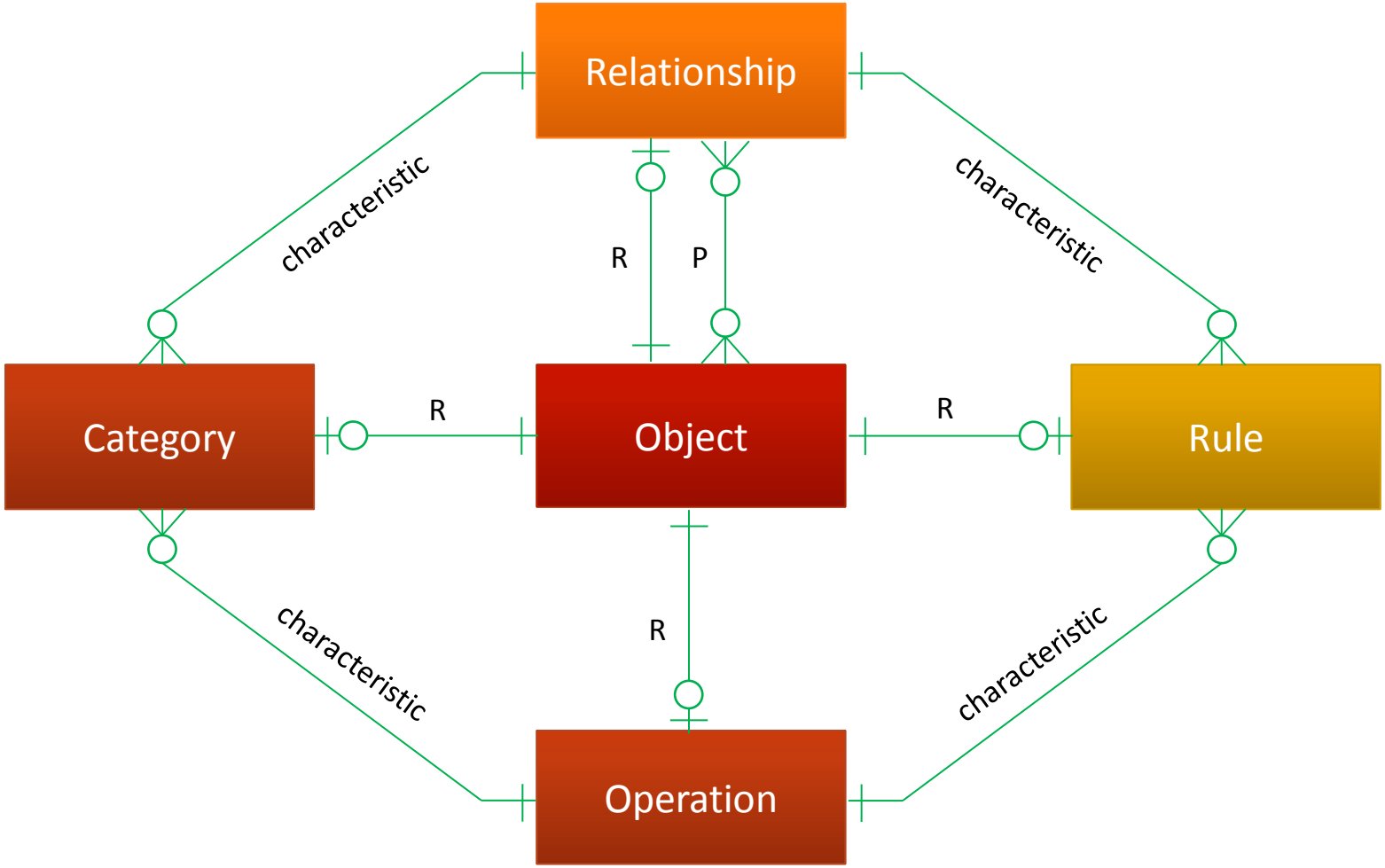
Which objects do we find interesting for modelling?



MENTION – USE duality

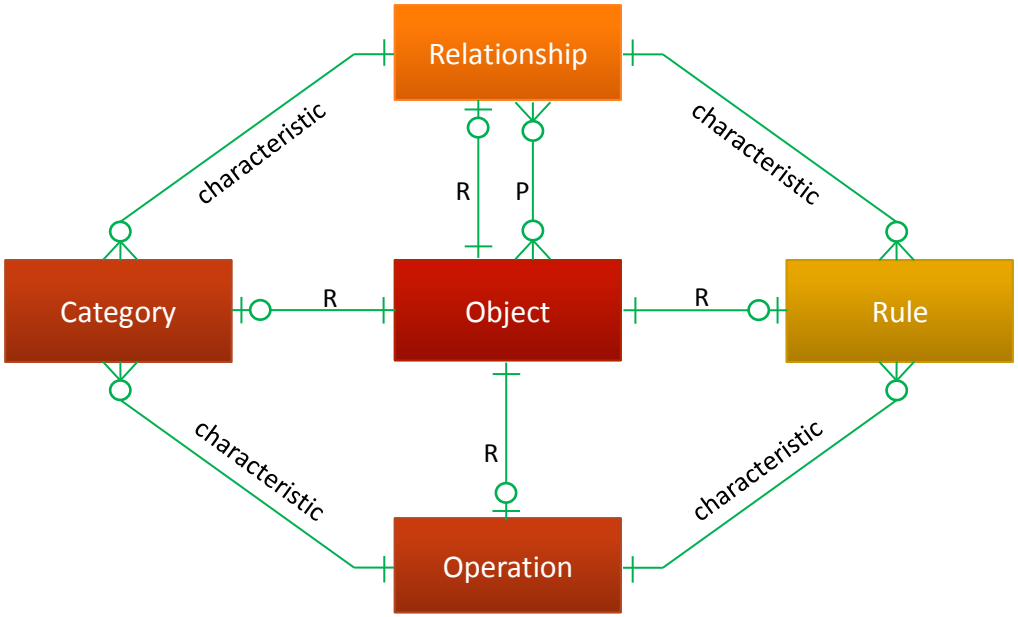


Diamond of Attention Focussing

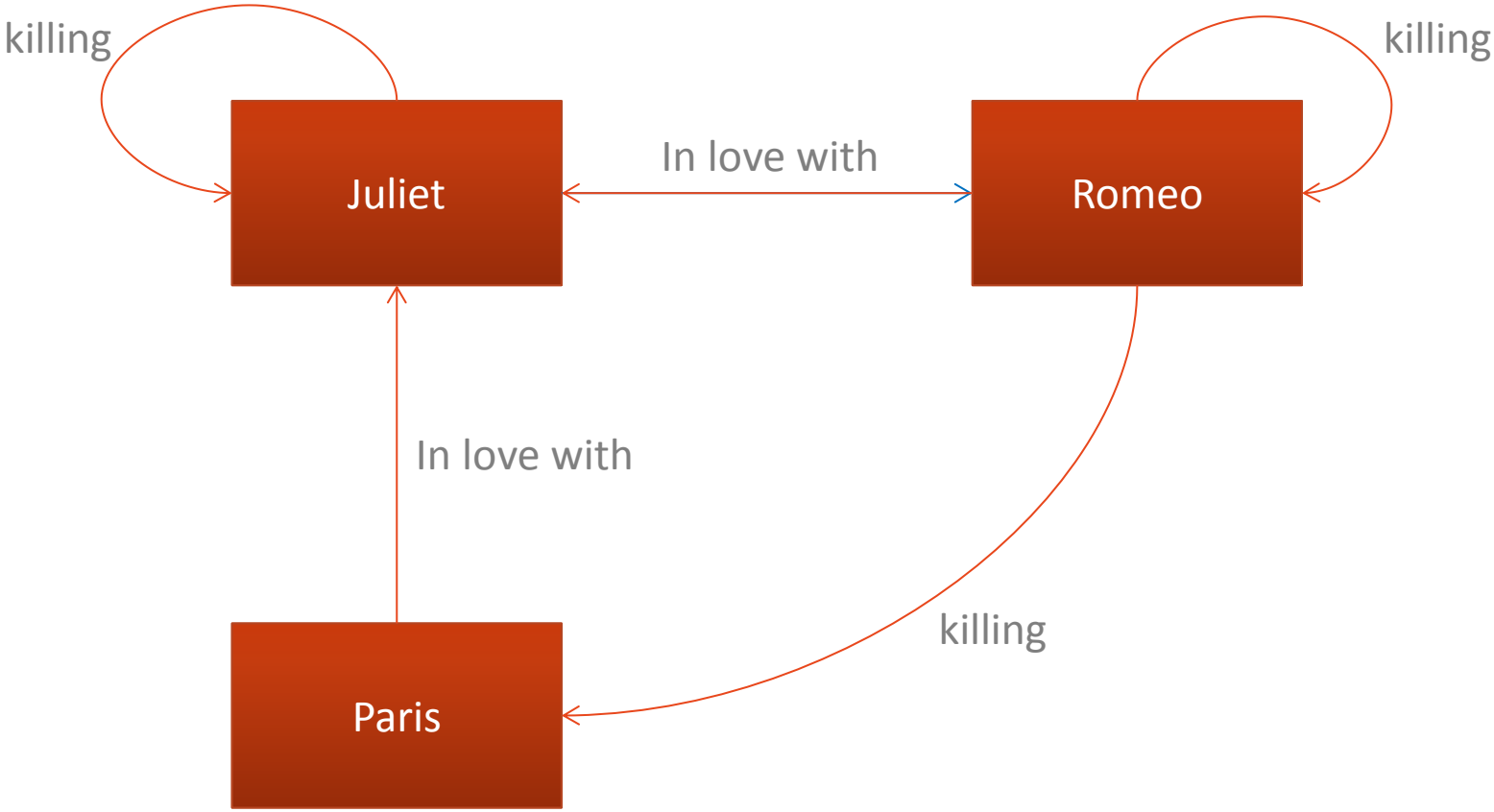


Diamond of Attention Focussing

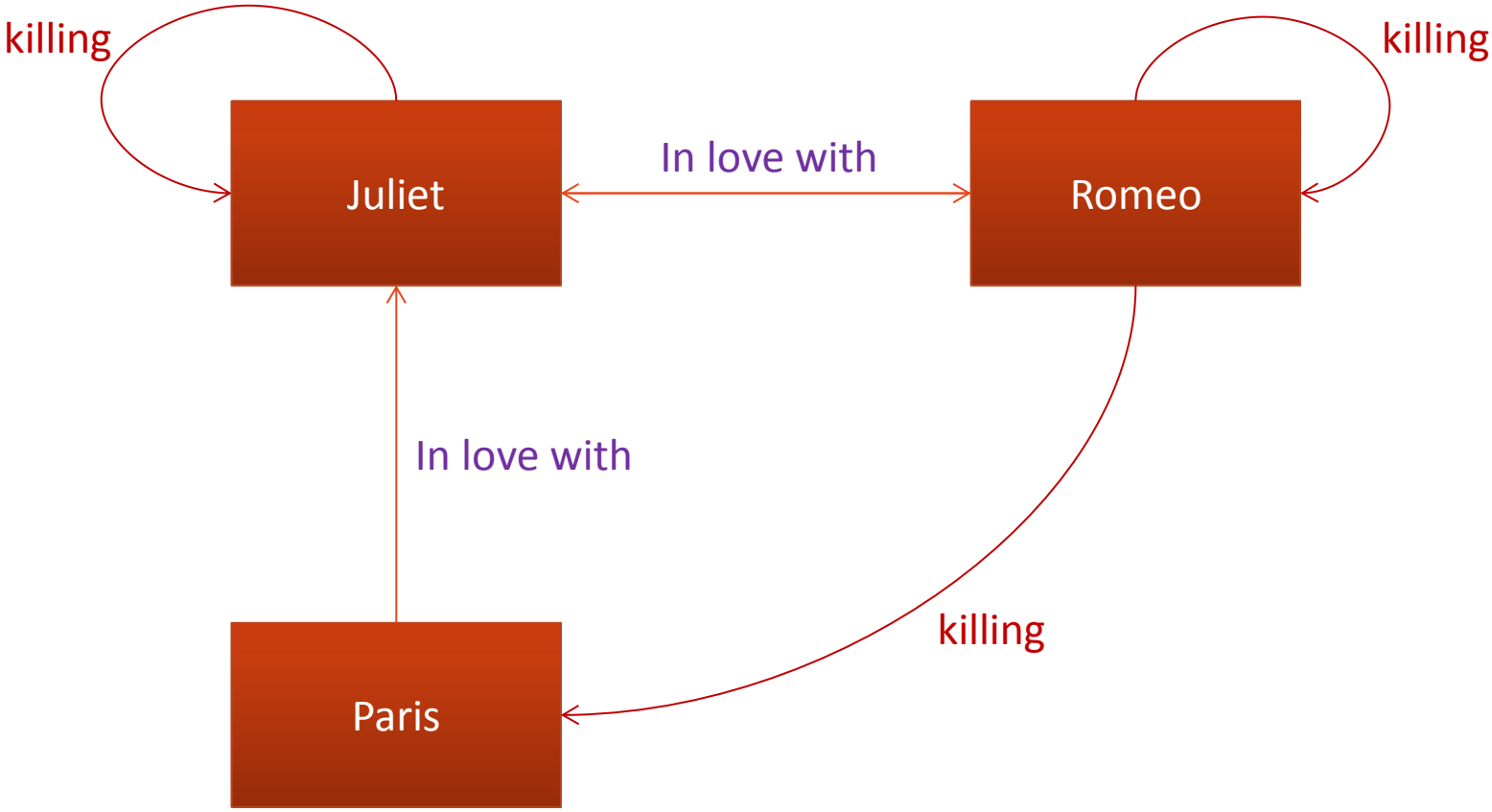
- Objects and relationships between them
- Mention-use duality
  - Modelling a modelling tool
  - Referring to itself



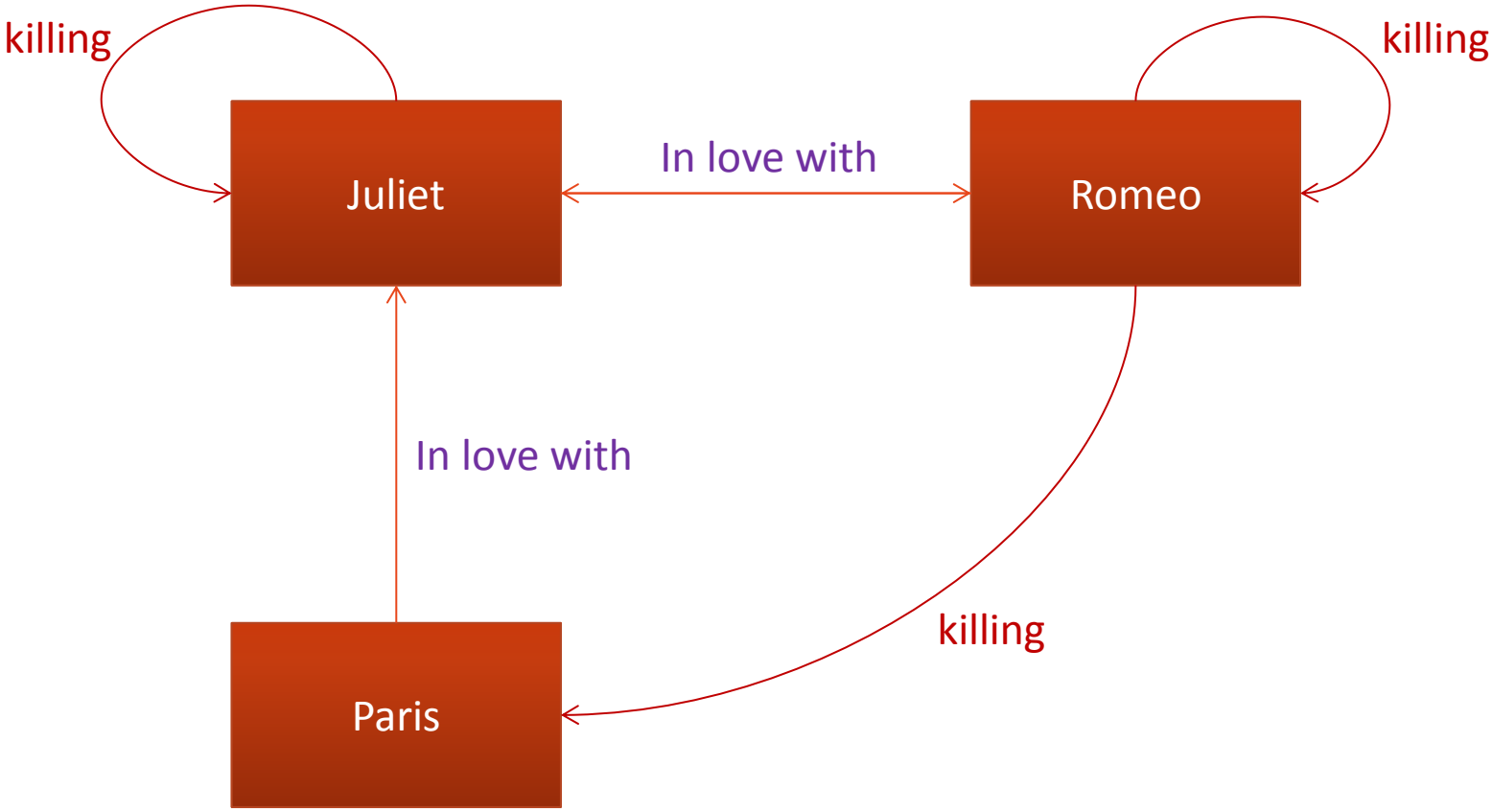
Classification example



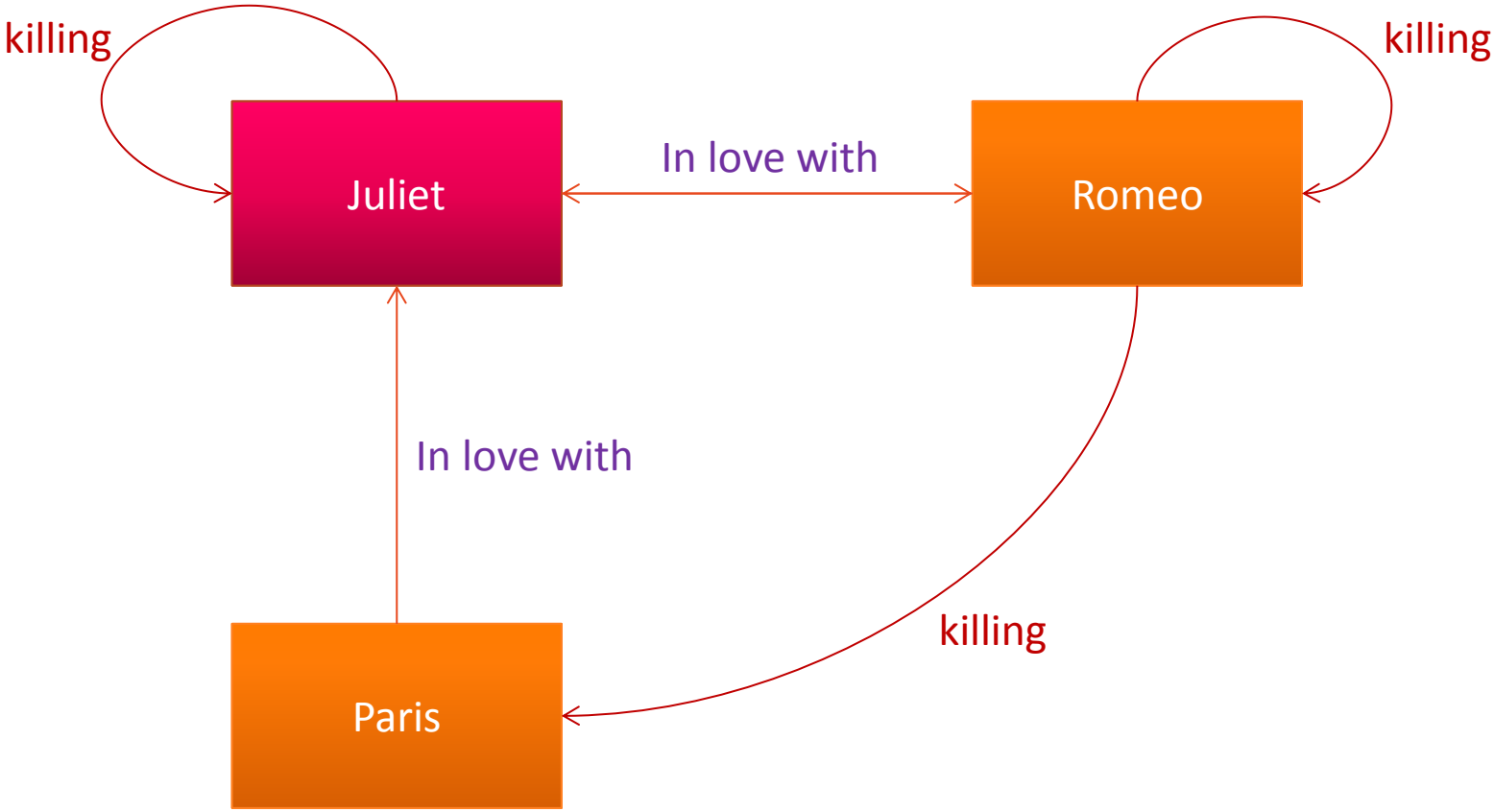
We can see that some connections are somehow similar – they belong to the same category:



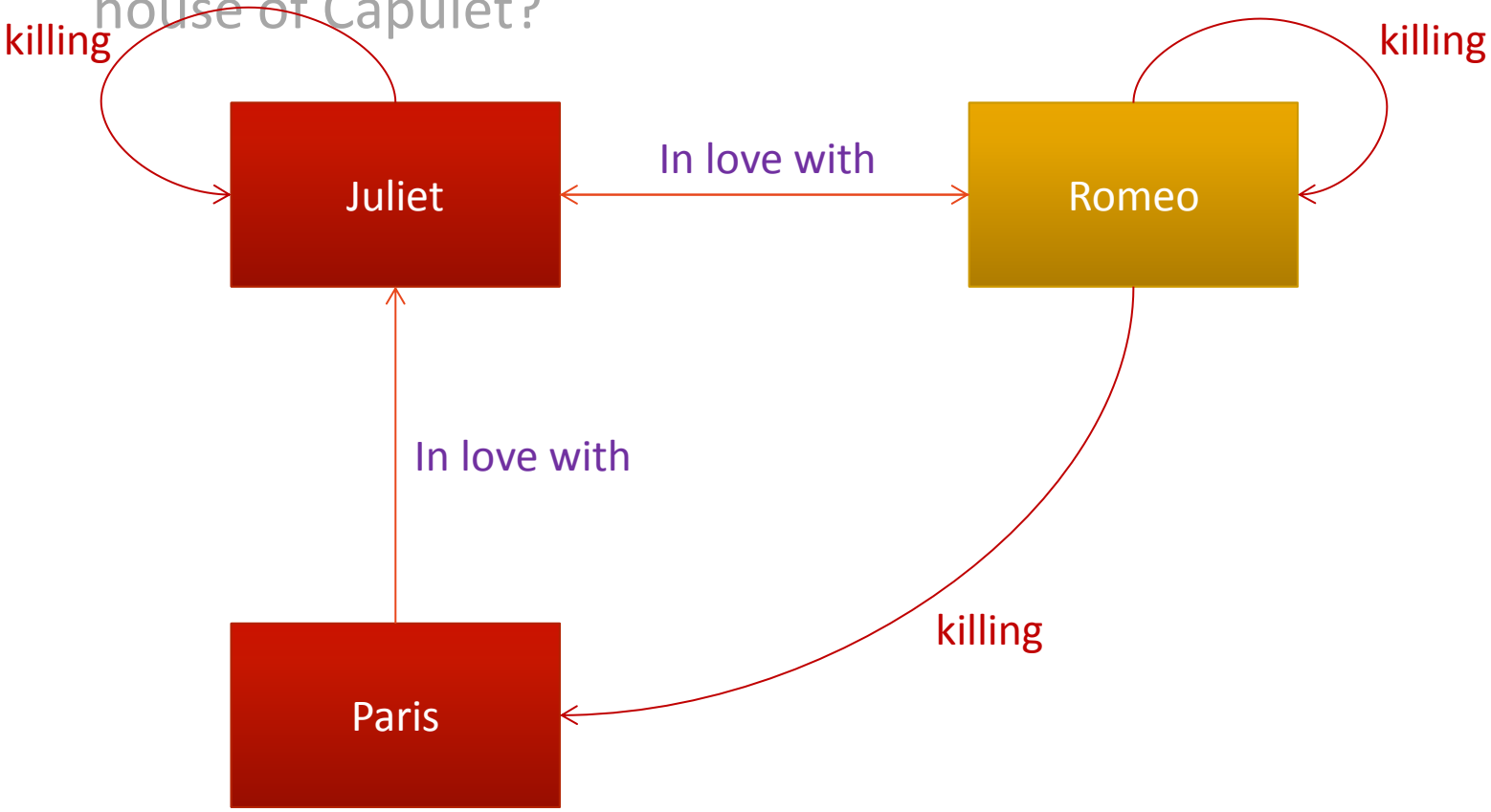
It‘s possible to classify everything we see in the diagram. But how to classify our objects?



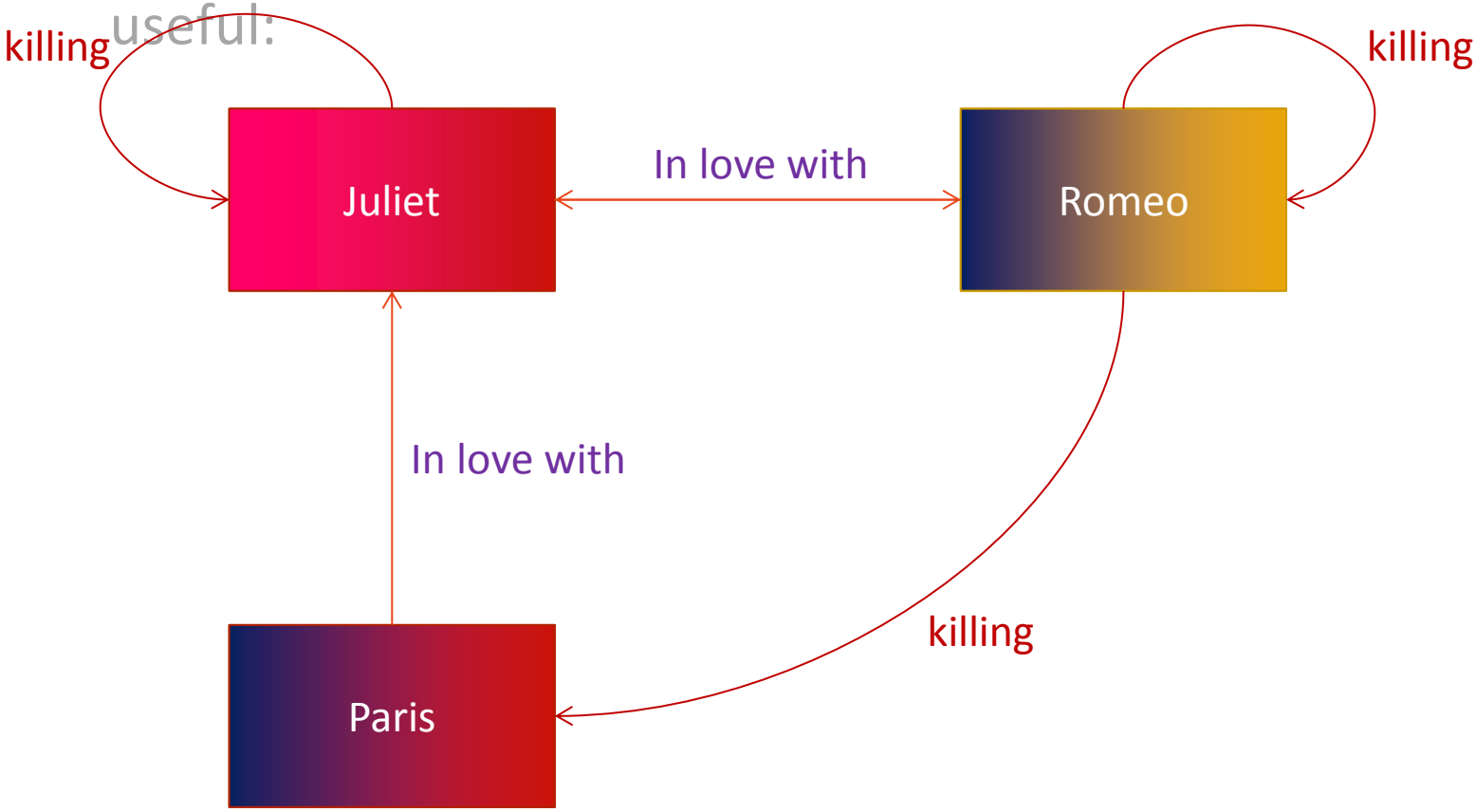
We could certainly divide the objects to men and women:



But won‘t it be more useful to show, which chatacter belongs to the house of Montague and which one to the house of Capulet?



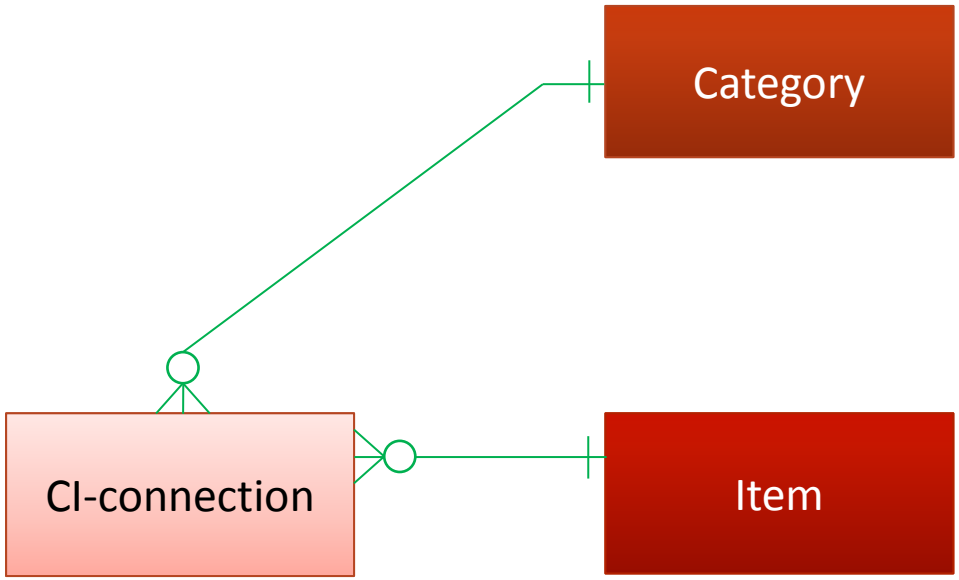
It probably depends on a context – a mental model we want to build. Sometimes, both categorizations may be useful:



Classifications are blurred
Good or bad?

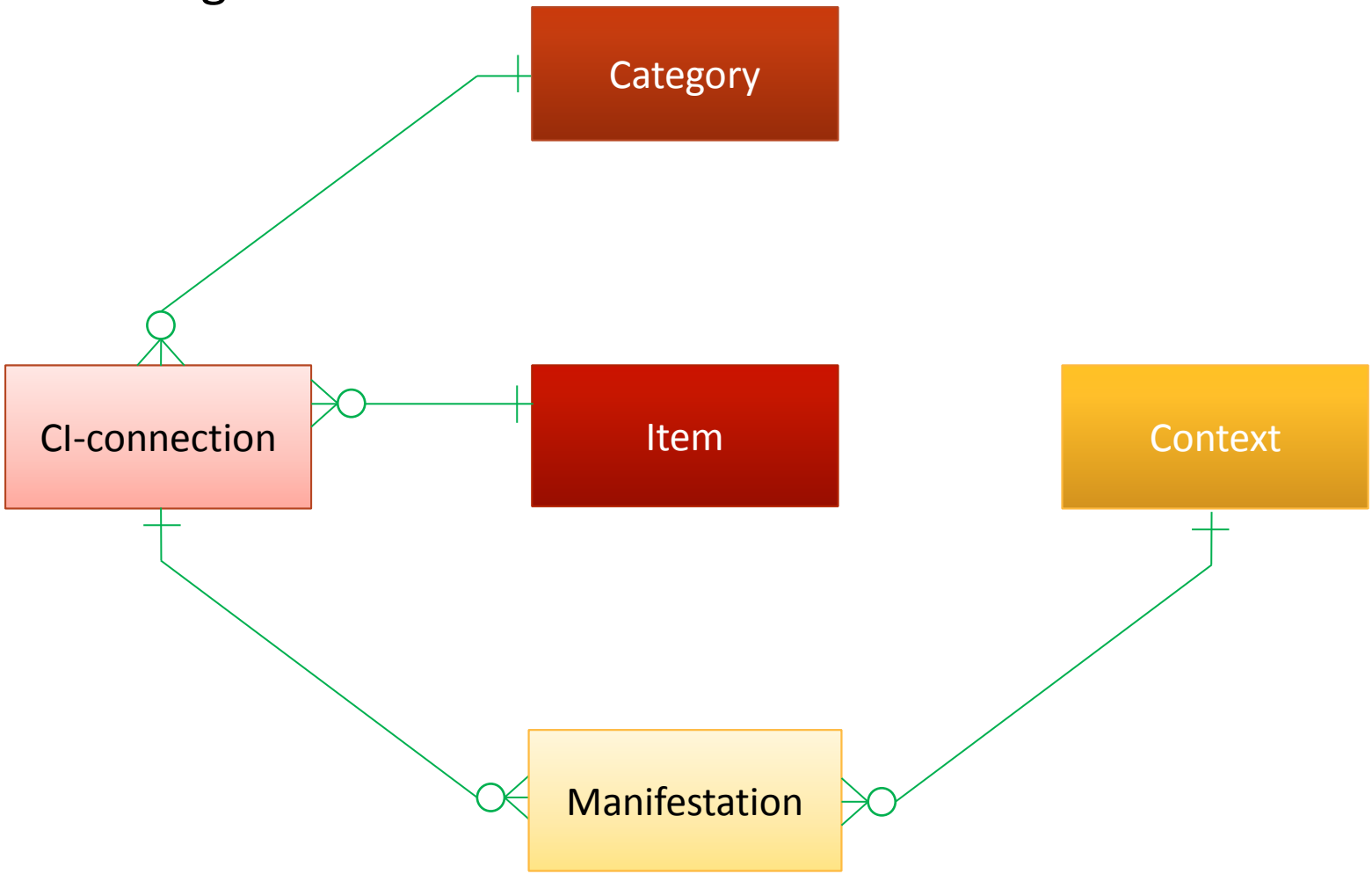
Certainty

- Items (= objects as such, not their constructs) belongs to a category with a given certainty



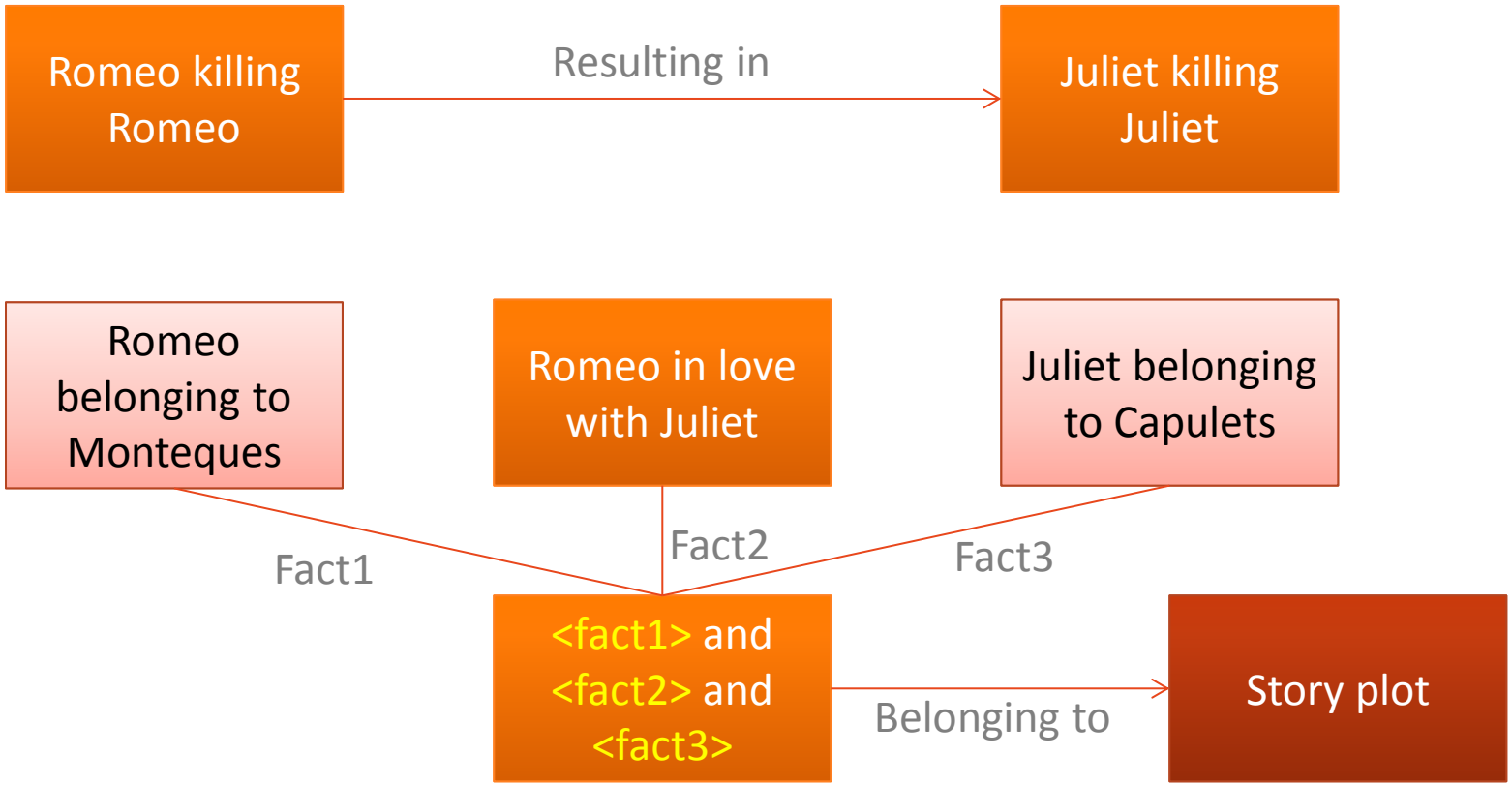
Attention

- The fact is manifested with a certain attention in a given context

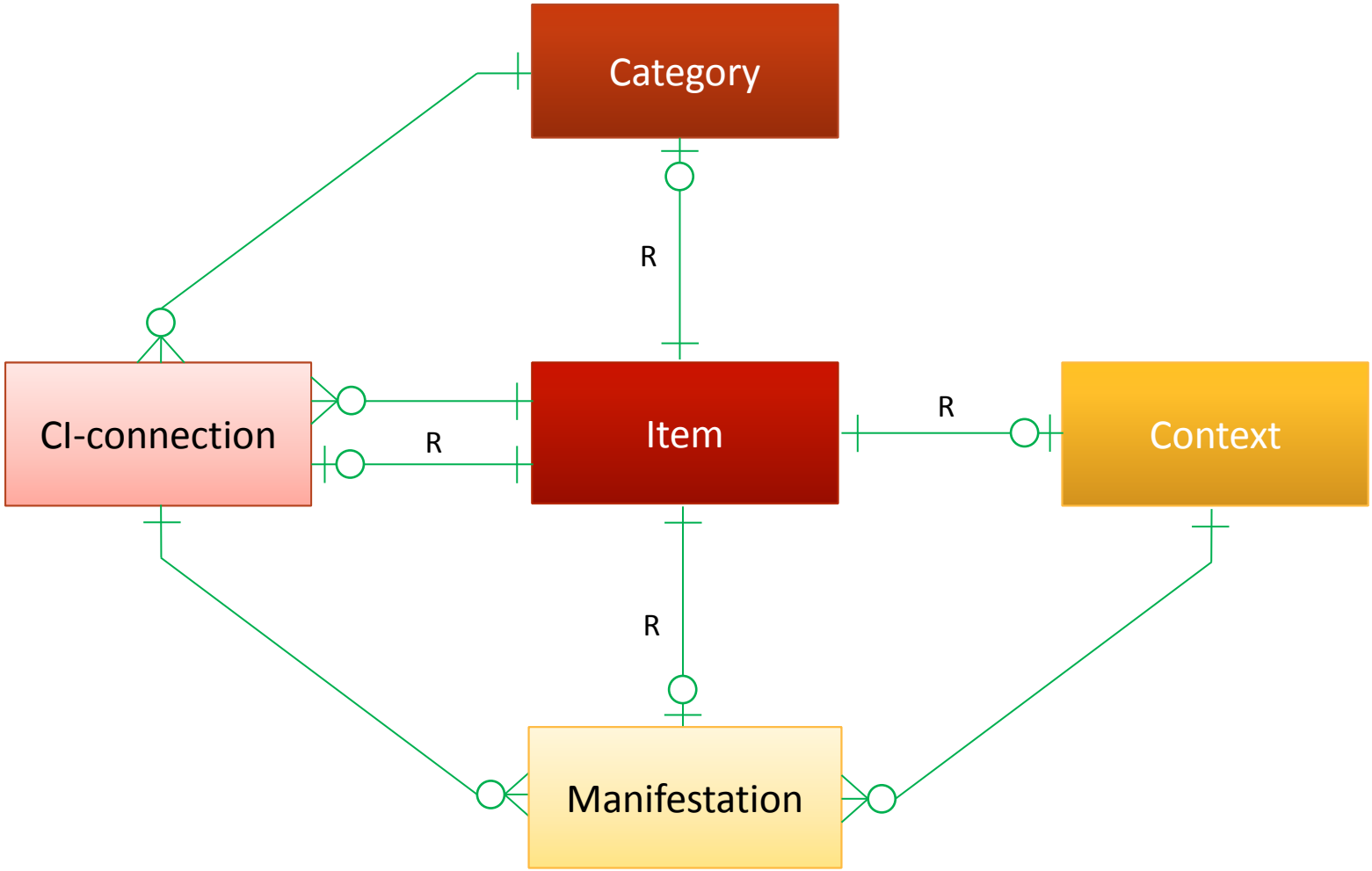


R-edges

- In some cases, it might be also useful to mention non-trivial concepts – contexts, categories, classifications or manifestations

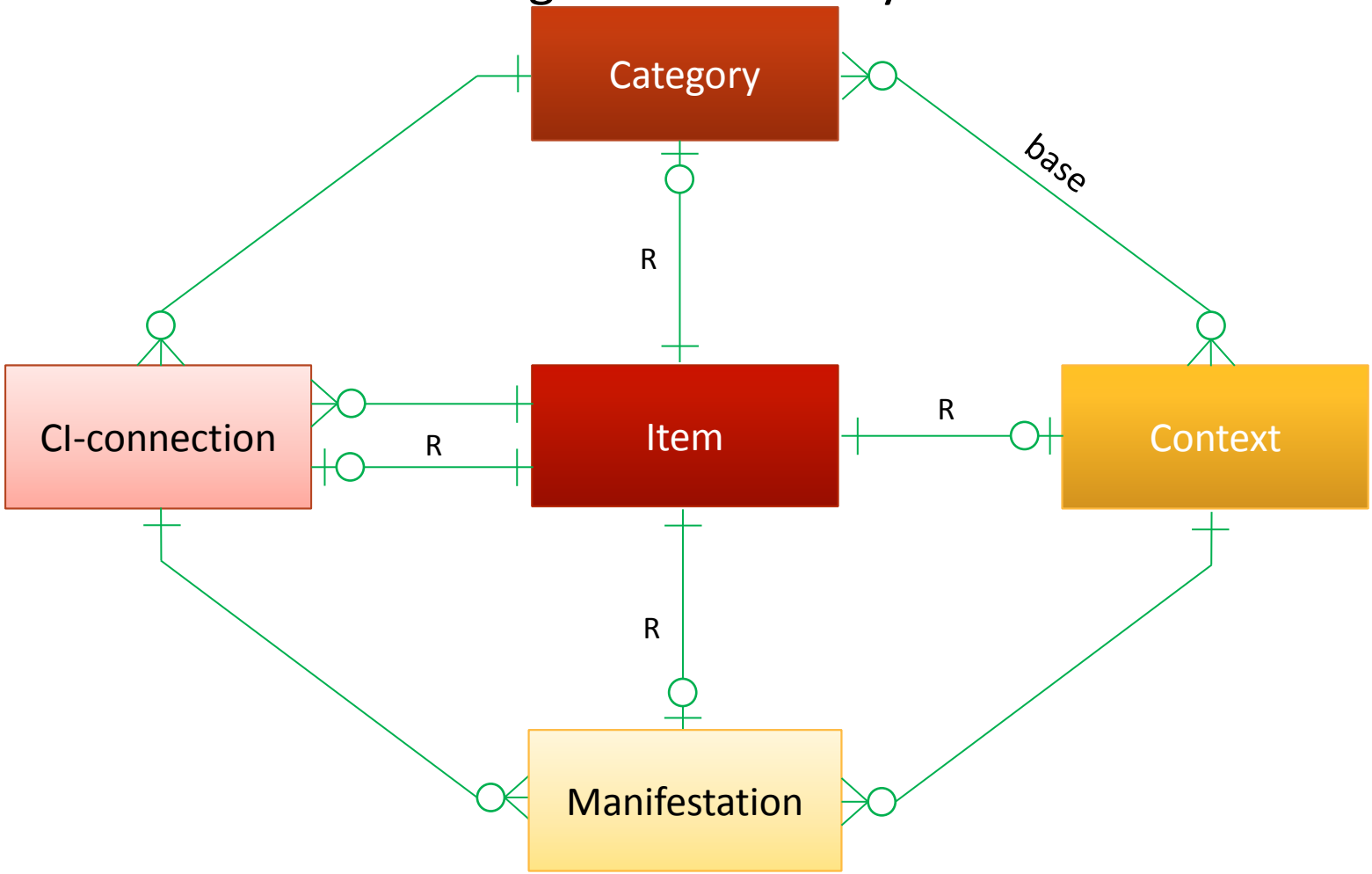


R-edges

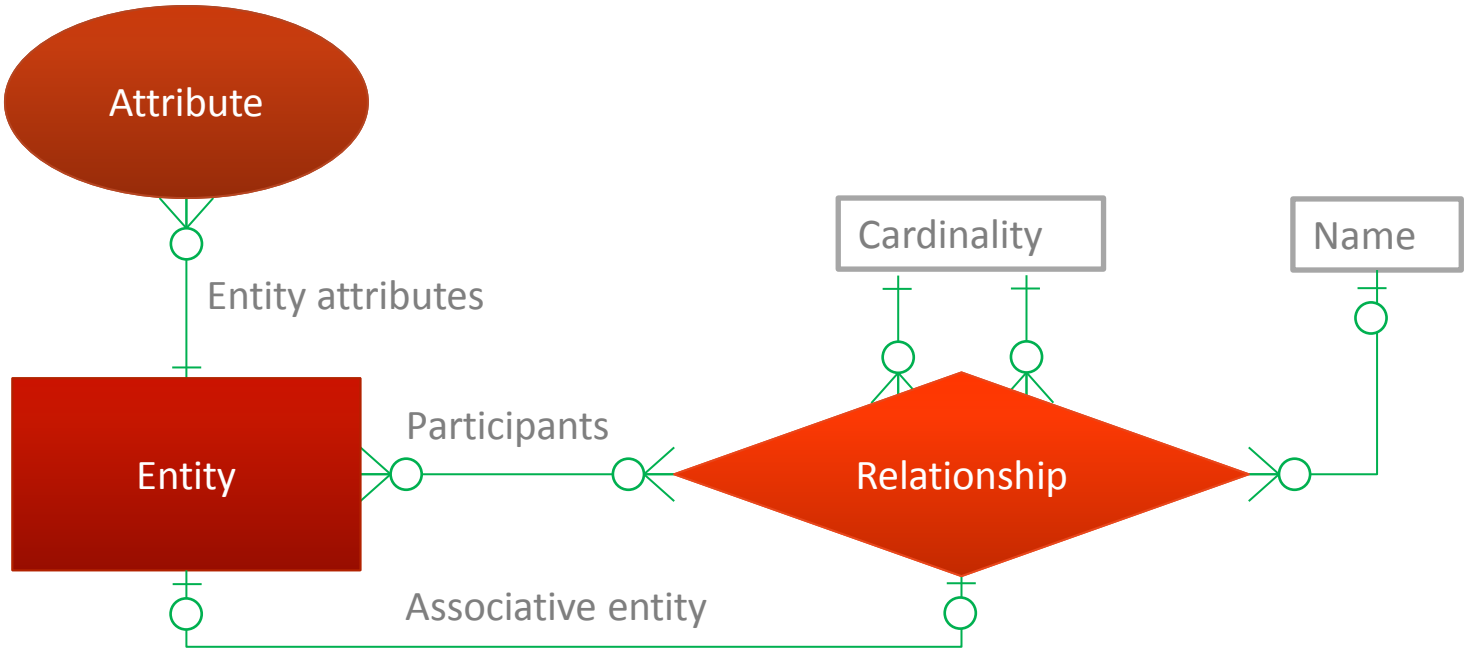


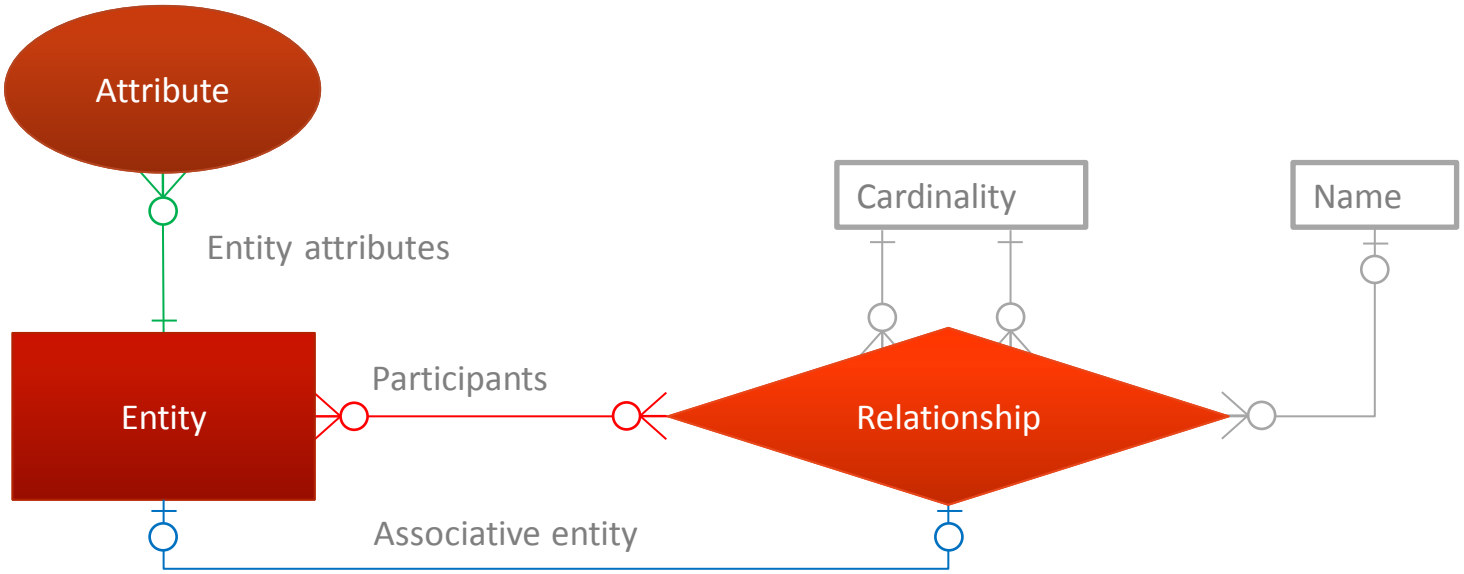
Context base

- Context serves as a model. The base edge defines the set of categories to classify its items to

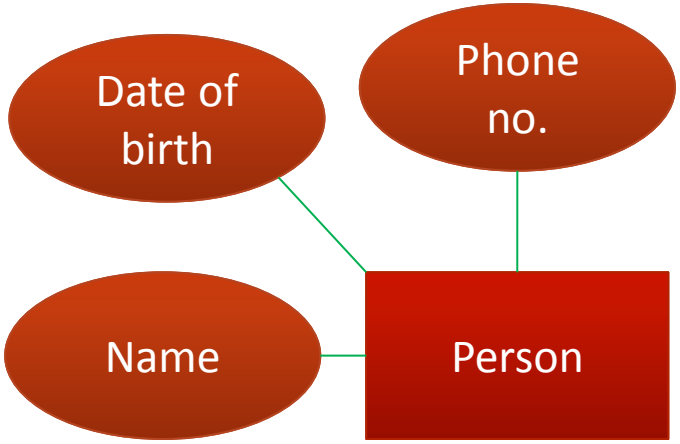


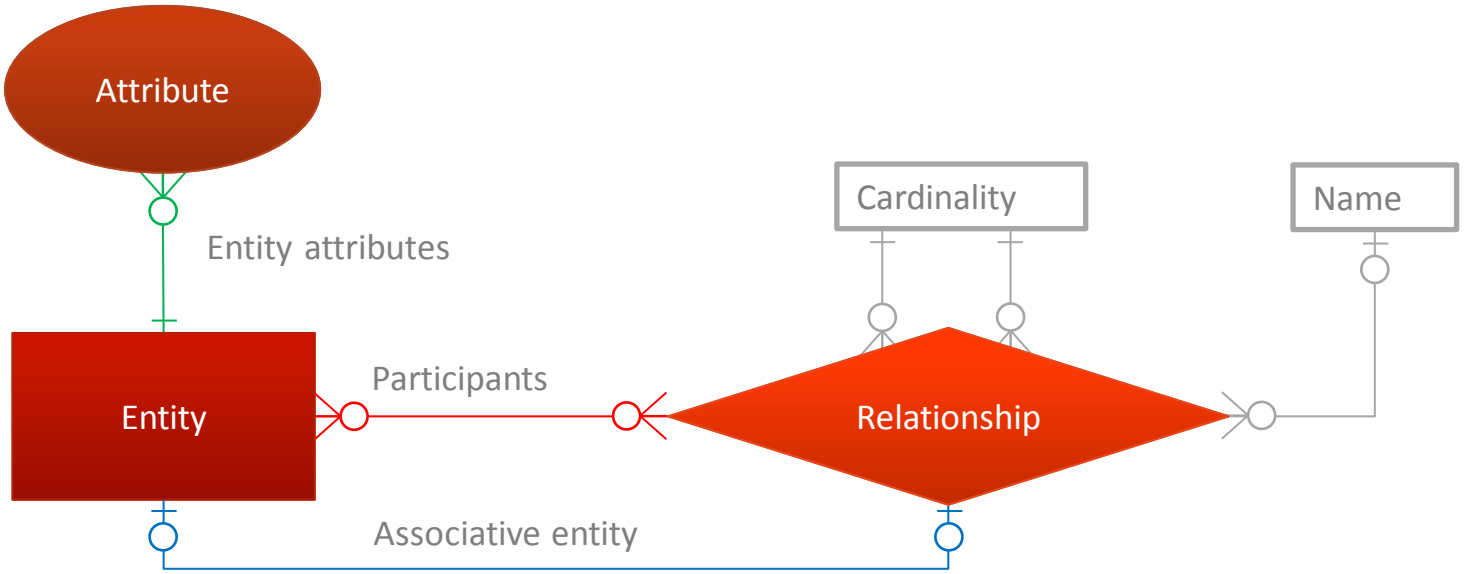
Example modelling tool: ERD



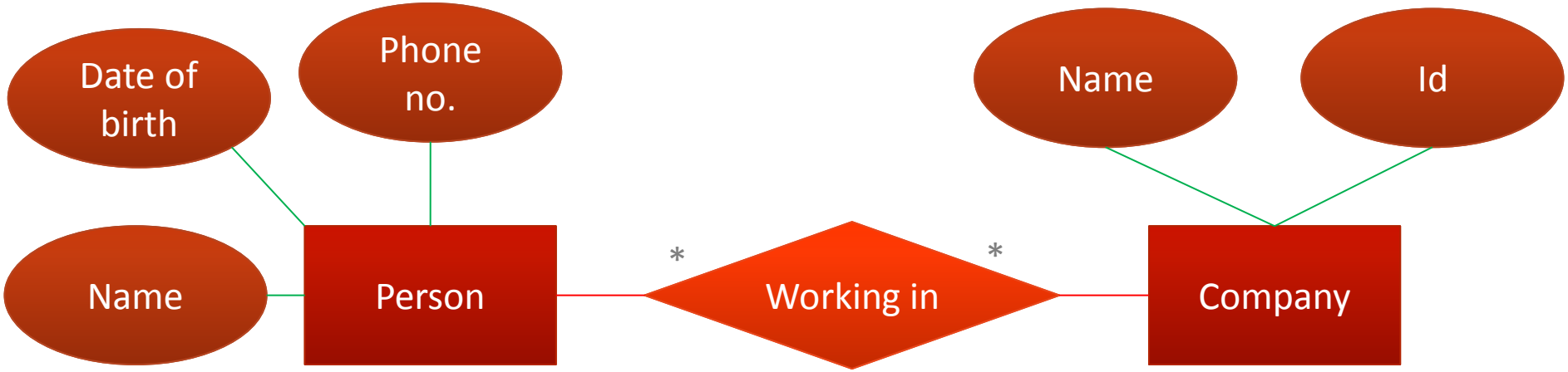


Forms category base for:



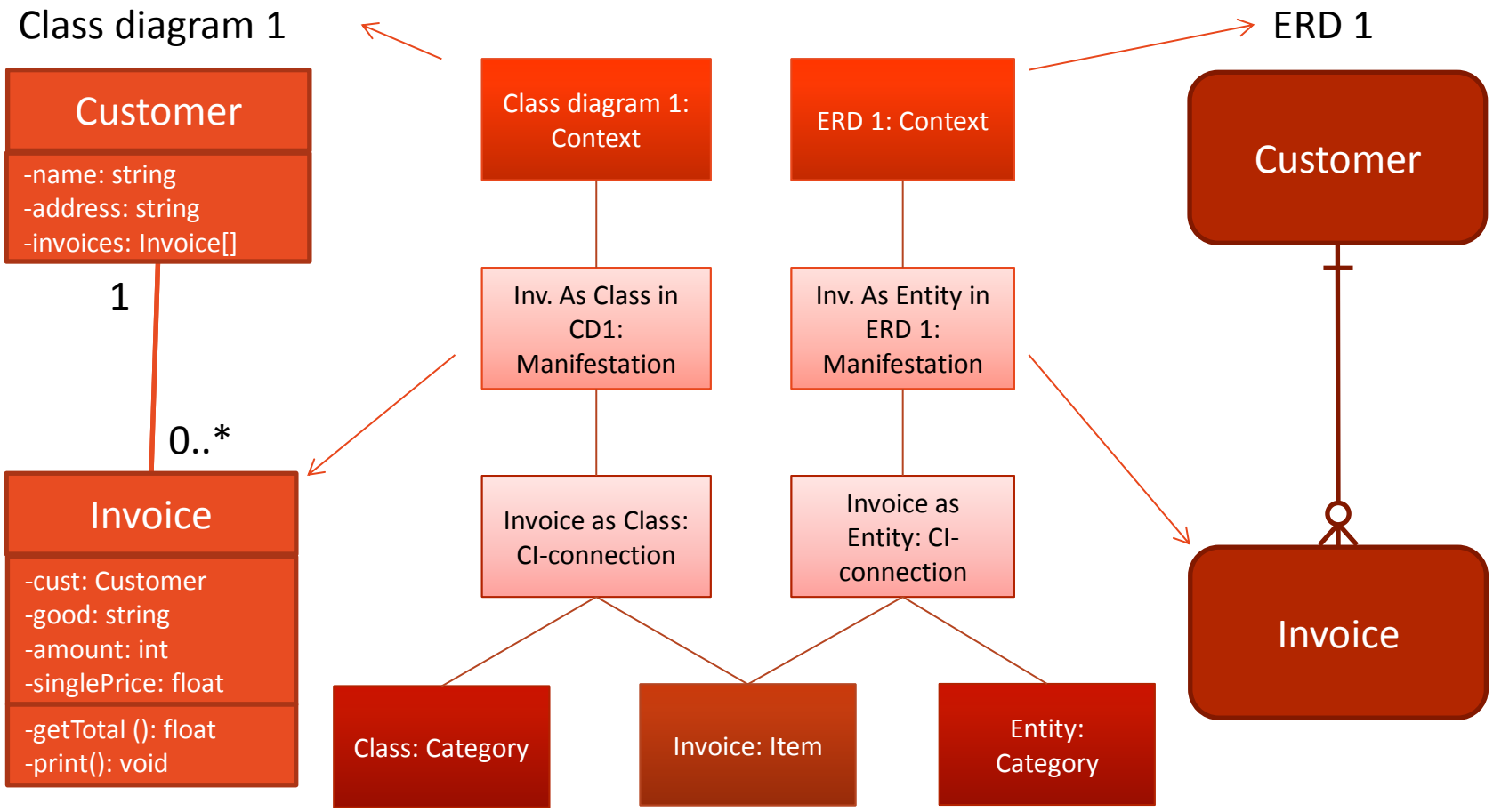


Here is a little more complex example of a model created in modelling tool above.

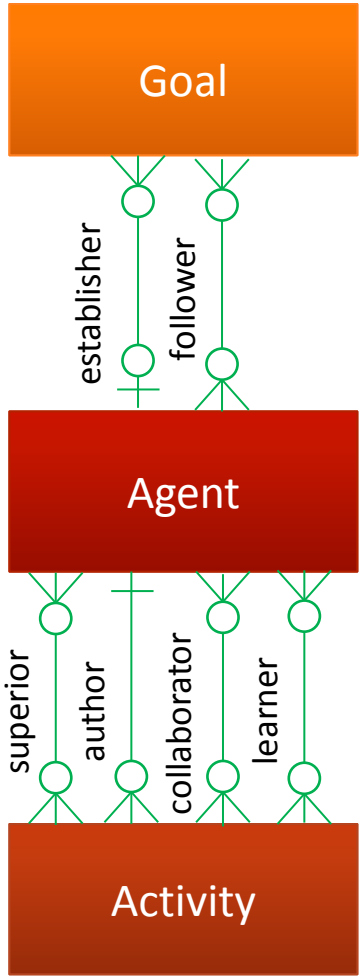


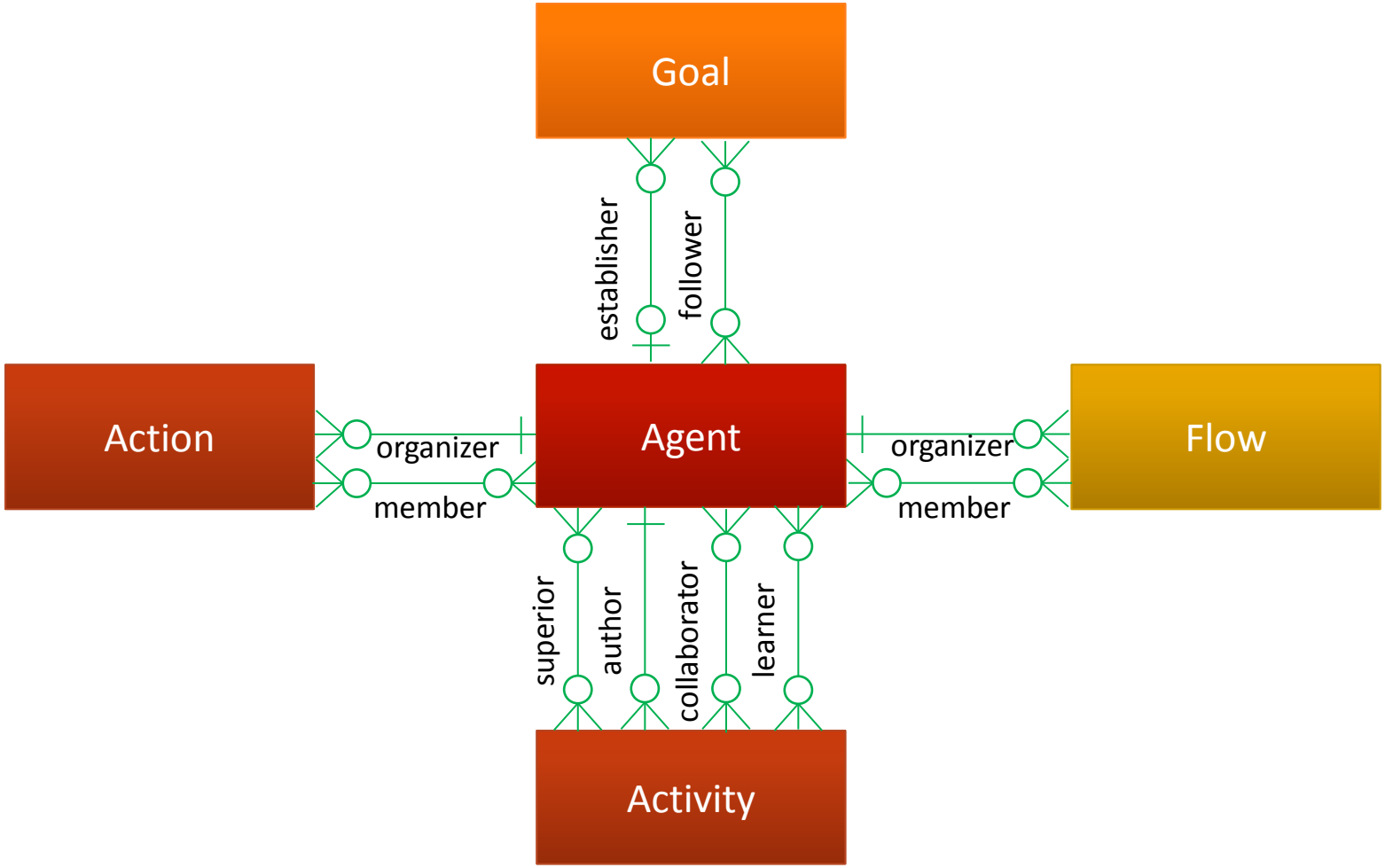
Interconnected models

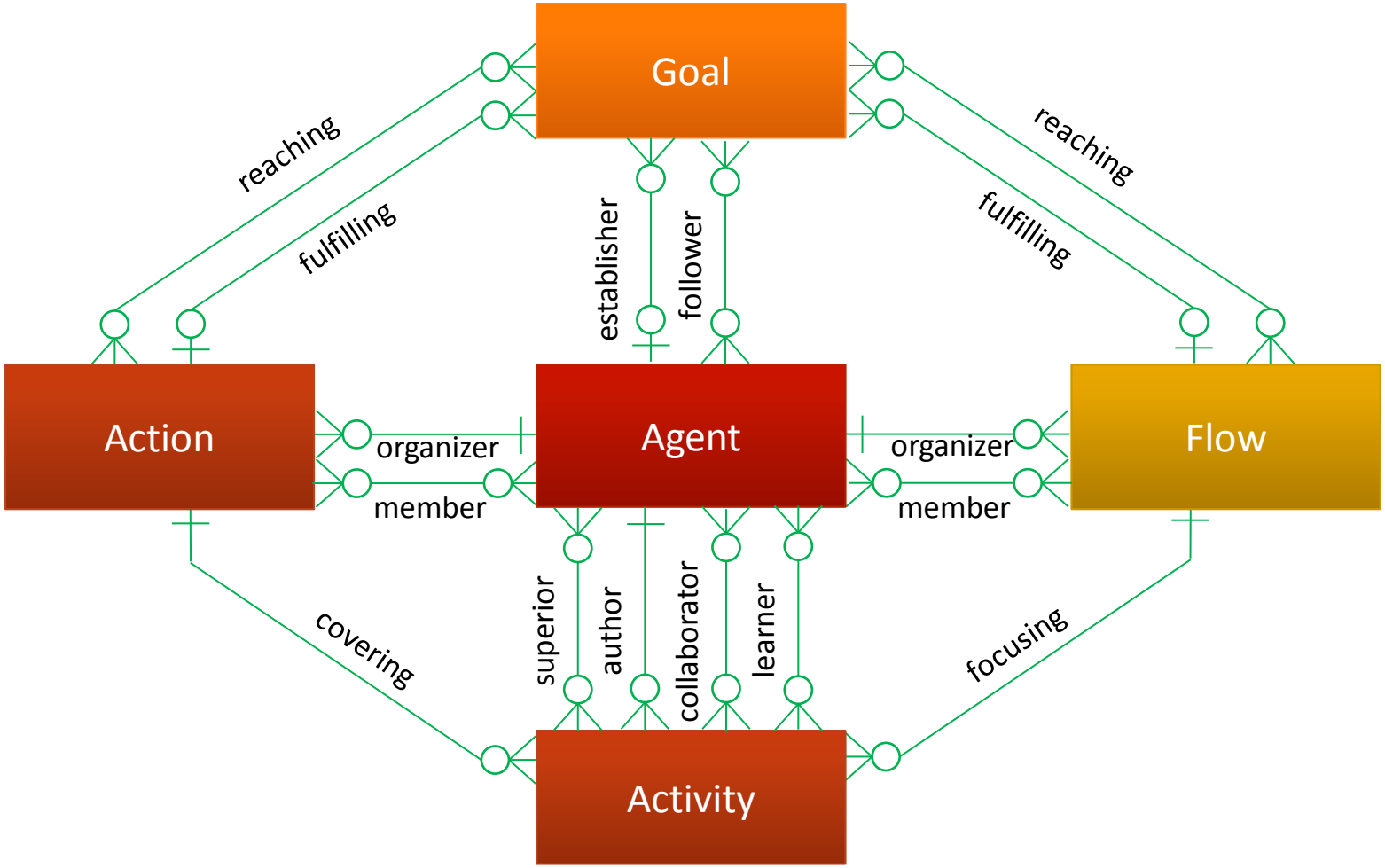
- The same object classified to different categories, manifested in different context

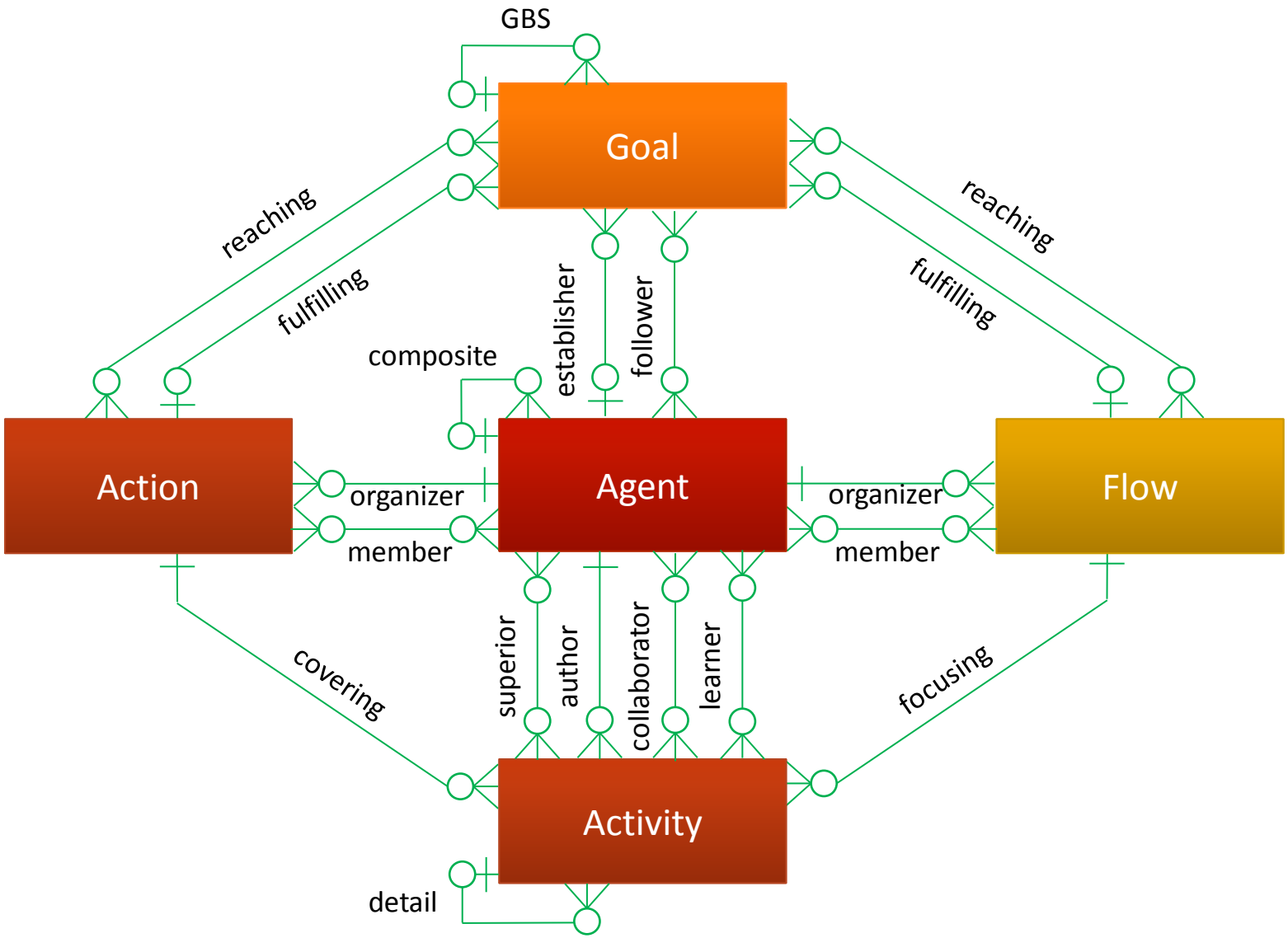


Diamond of Agent-Team Organization




Goal
establisher
follower
Action
organizer
member
Agent
organizer
member
Flow
superior
author
collaborator
learner
Activity


Goal
reaching
fulfilling
establisher
follower
reaching
fulfilling
Action
organizer
member
Agent
organizer
member
Flow
covering
superior
author
collaborator
learner
focusing
Activity


GBS
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organizer
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Agent
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Flow
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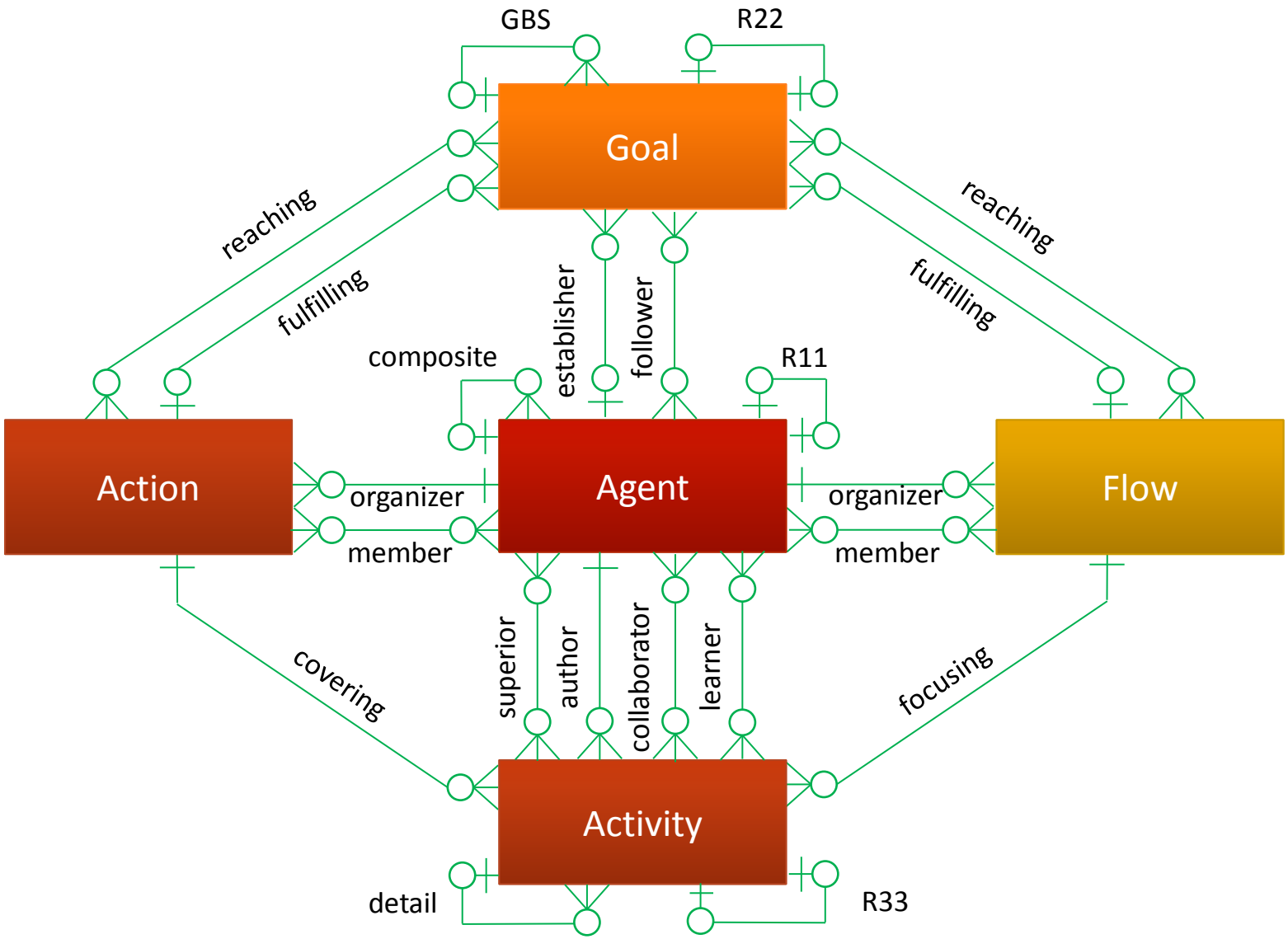
author
collaborator
learner
focusing
Activity
detail


GBS
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Goal
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fulfilling
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Flow
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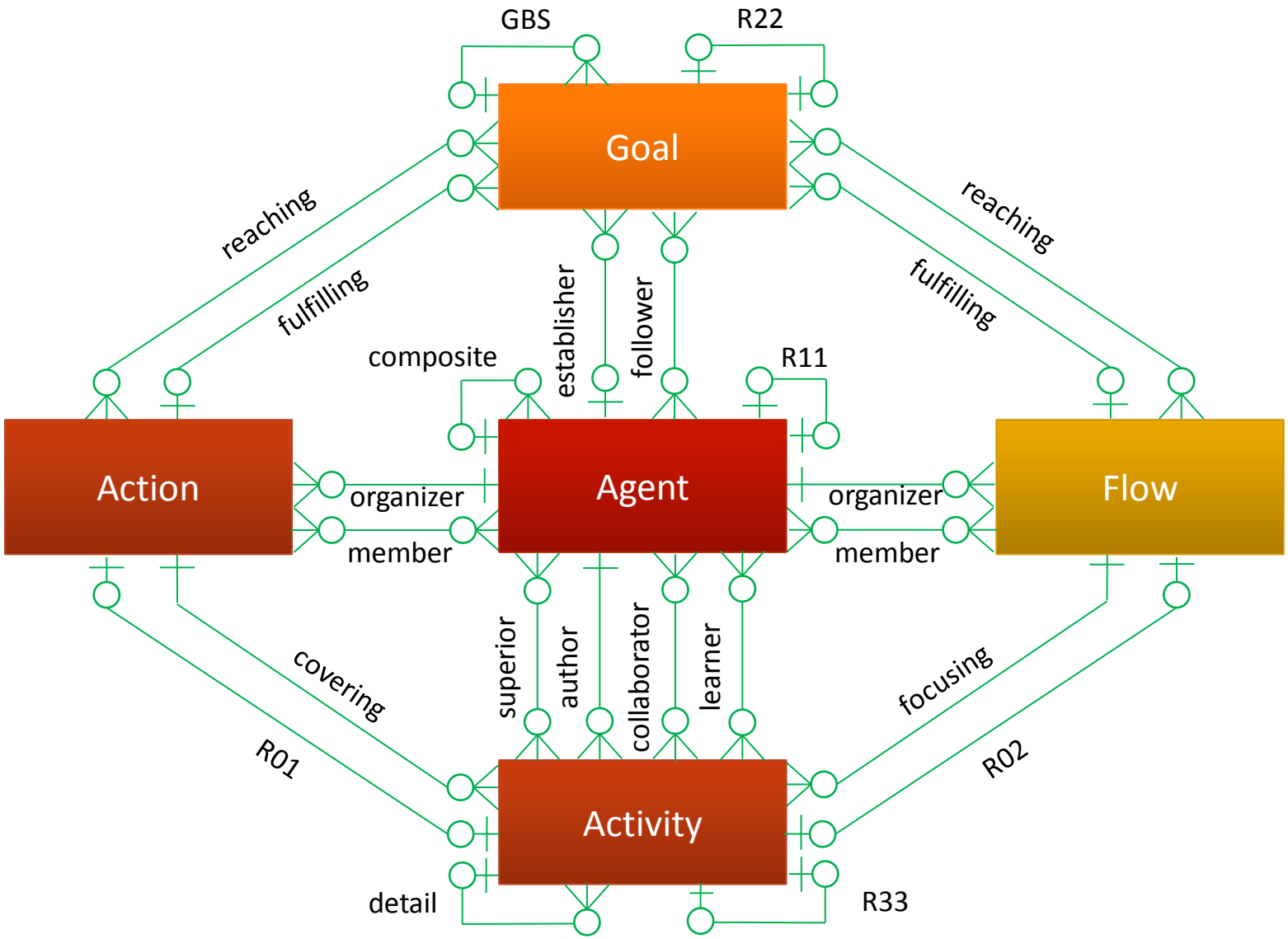
learner
focusing
Activity
detail
R33


GBS
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Action
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Agent
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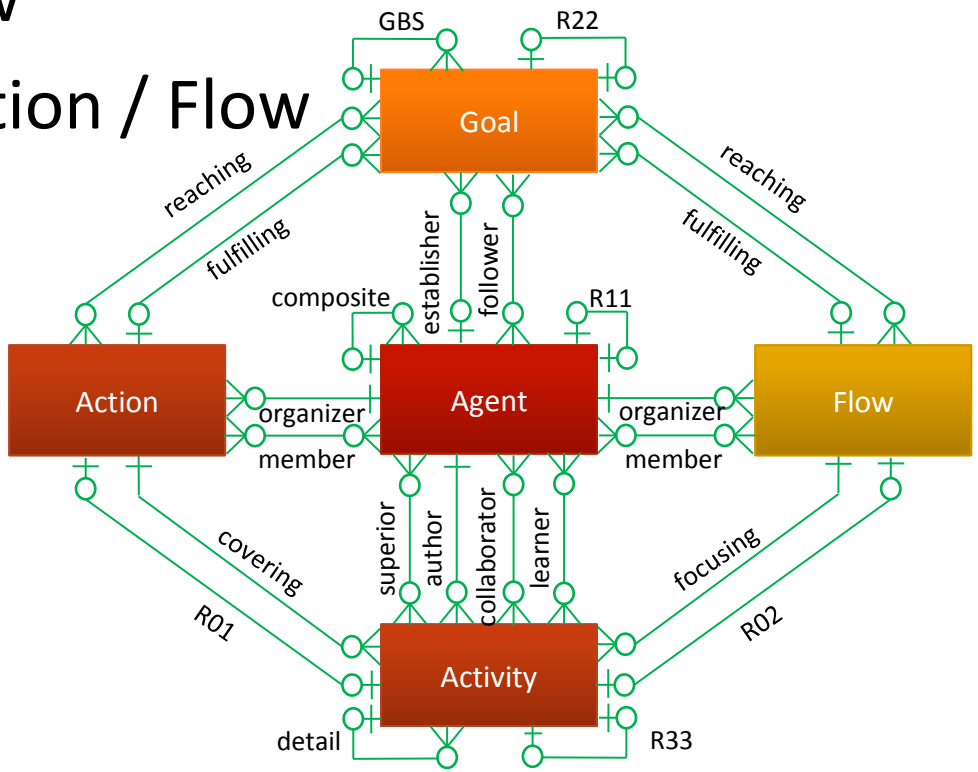
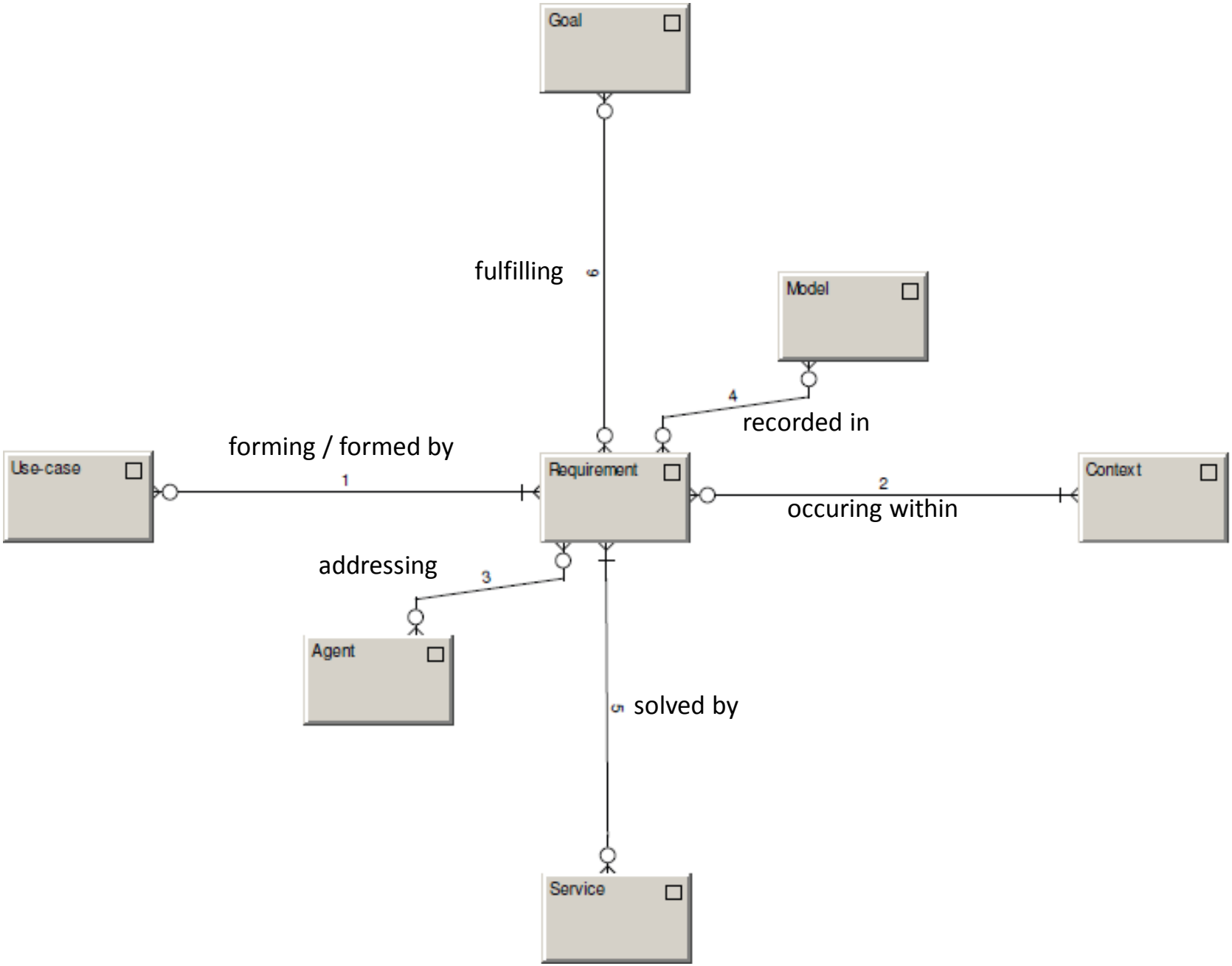
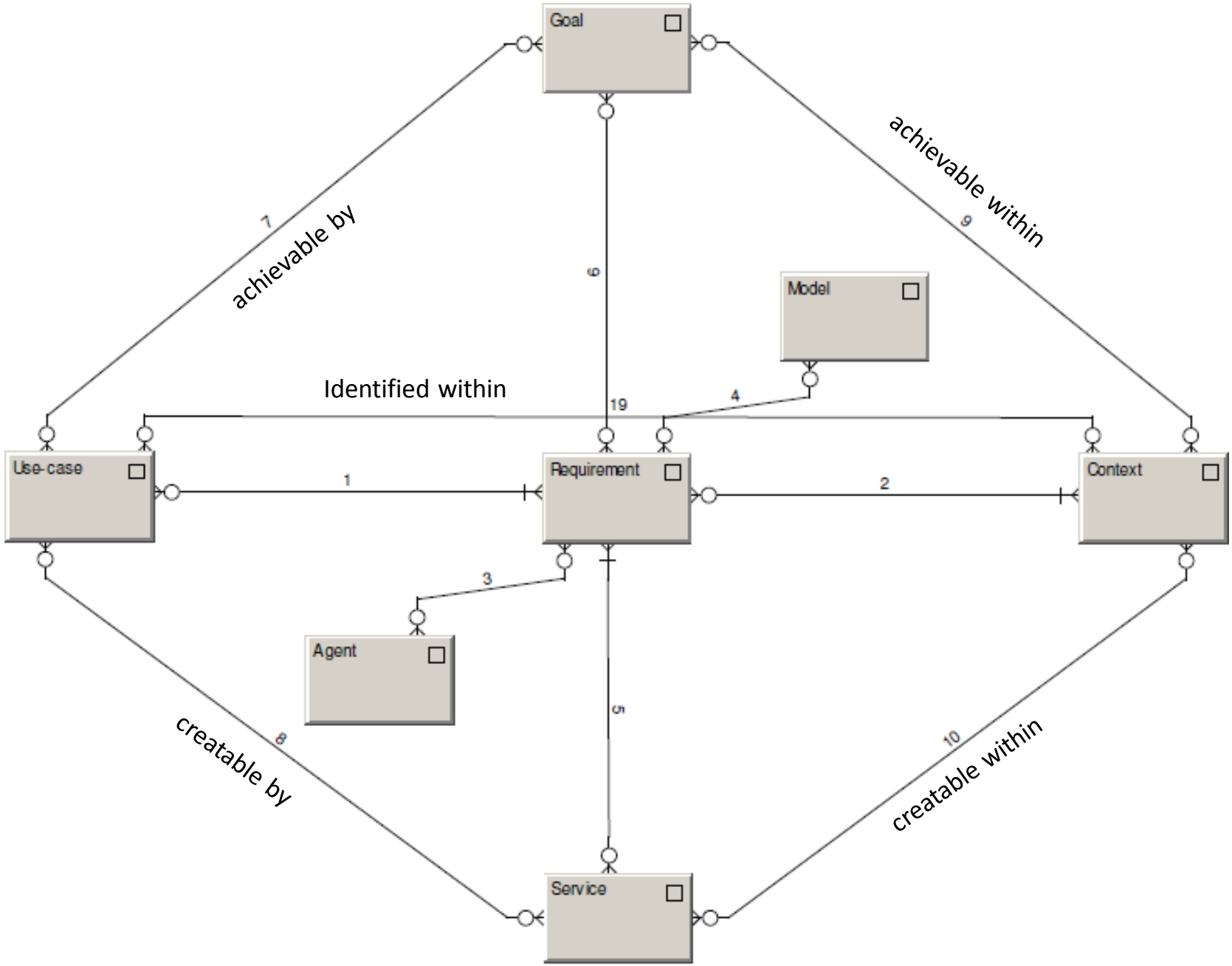
Flow
superior
author
collaborator
learner
covering
R01
focusing
R02
Activity
detail
R33

Diamond of Organization
Summary

- Matrix-based organization: Action vs. Flow
- Activity vs. Action / Flow
- R-edges




Goal
fulfilling
6
Model
4
recorded in
forming / formed by
Use-case
1
Requirement
2
occuring within
Context
addressing
3
Agent
5
solved by
Service


Goal
achievable by
achievable within
7
9
6
Model
Identified within
19
4
Use-case
1
Requirement
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Agent
creatable by
creatable within
8
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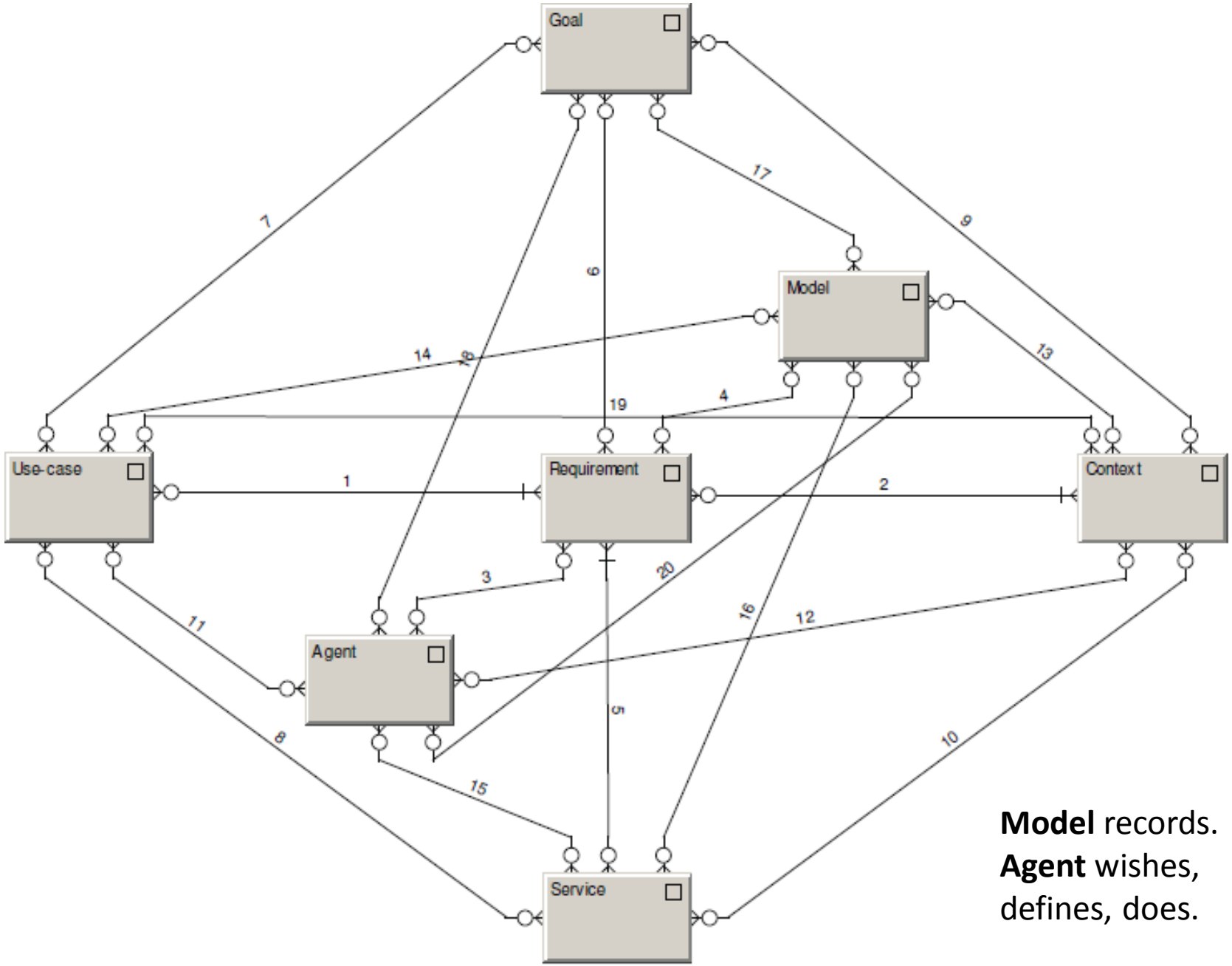
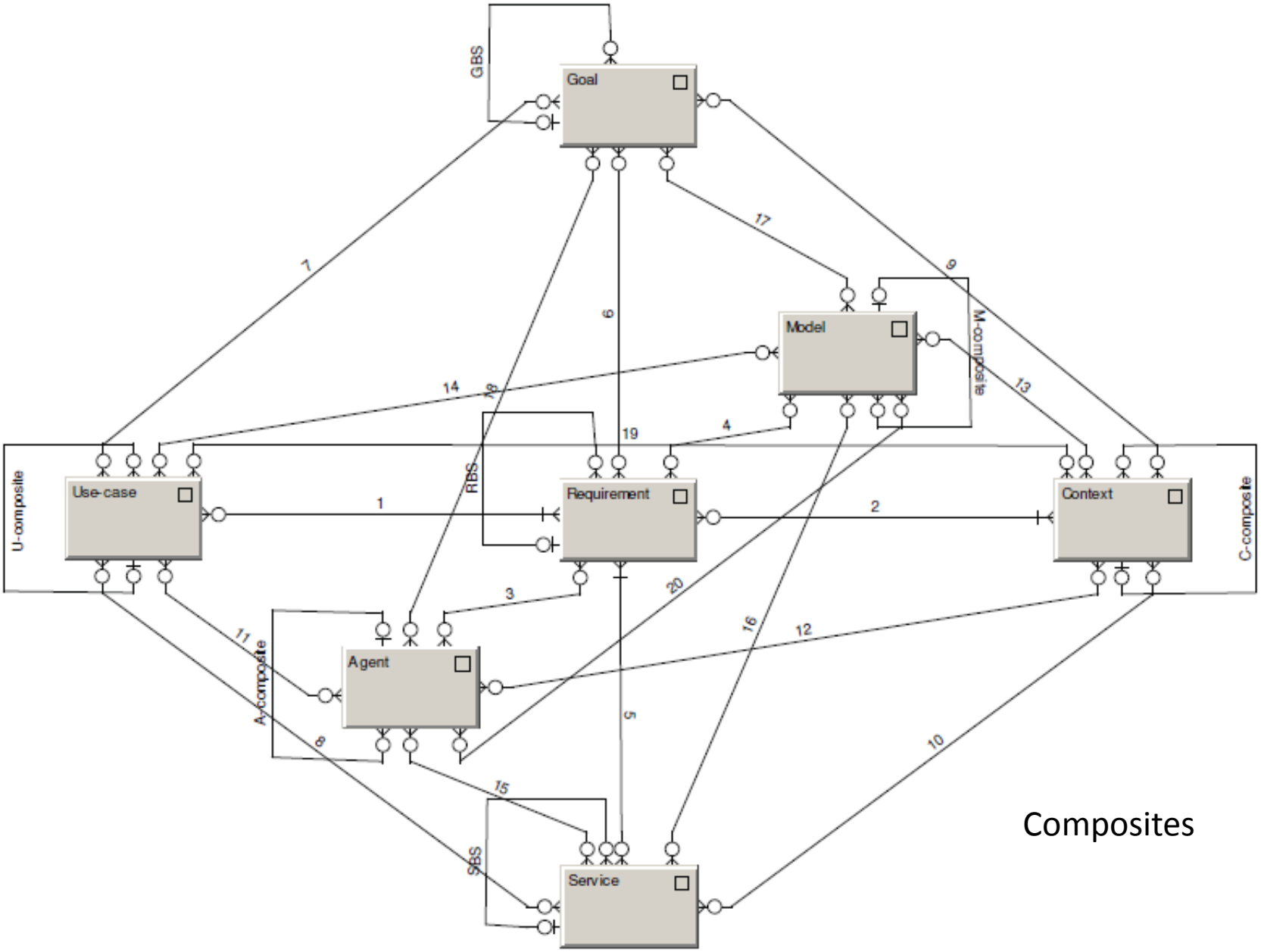
10
Service



Model records.
Agent wishes, defines, does.


GBS
Goal
Model
M-composite
Use-case
U-composite
RBS
Requirement
Context
C-composite
Agent
A-composite
SBS
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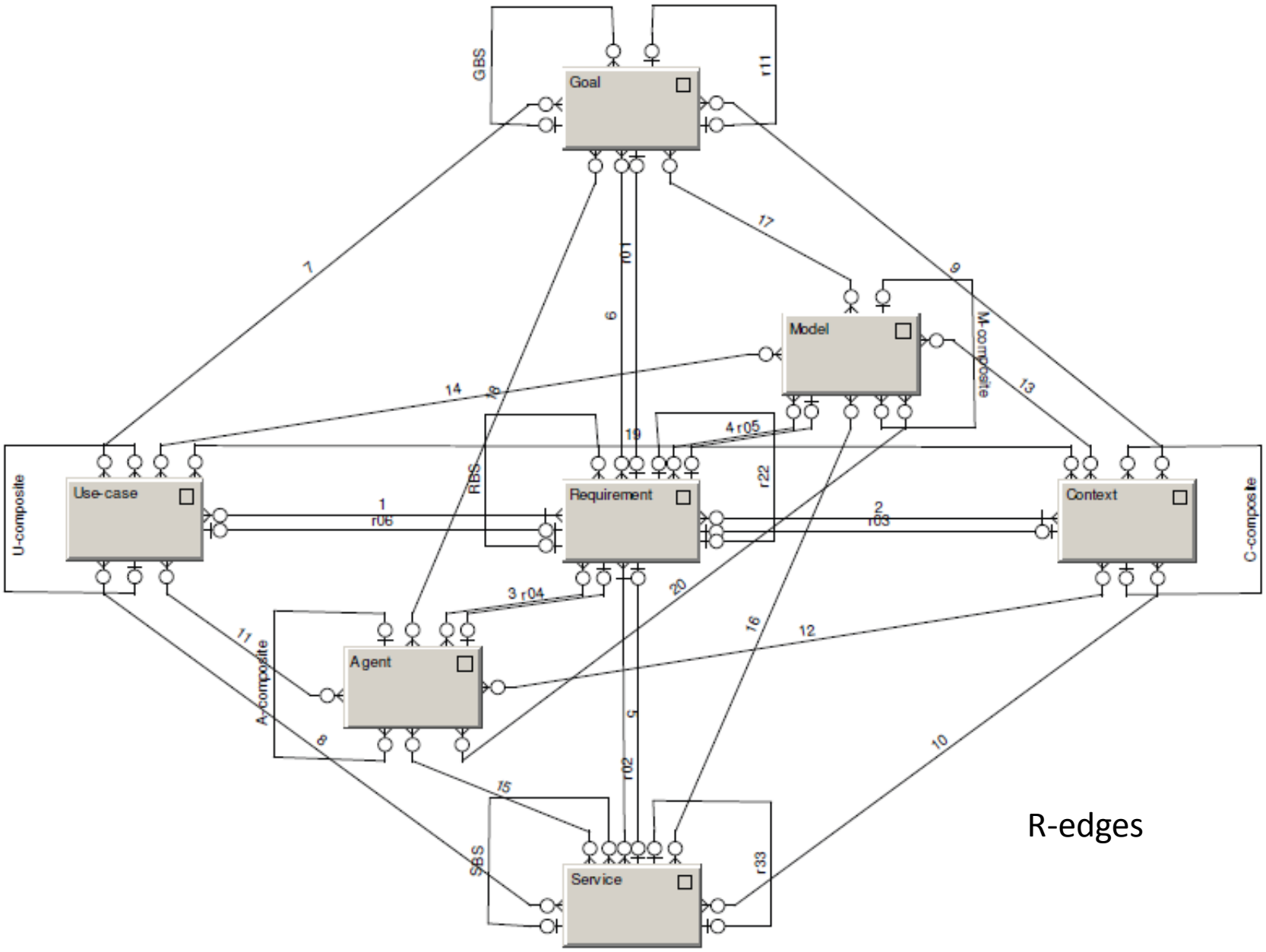
Composites


Goal
Model
Use-case
Requirement
Context
Agent
Service
GBS
RBS
SBS
U-composite
A-composite
M-composite
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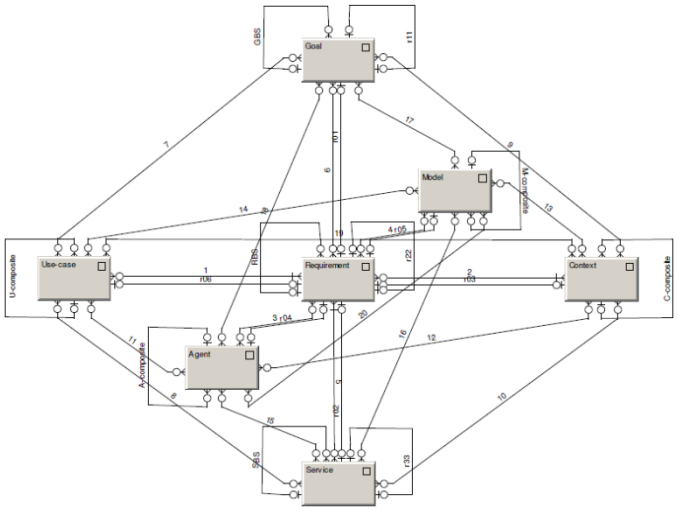
R-edges

Diamond of Predictive Behaviour

- Depicts the motivation of agents to DO
- Everything can be seen as a requirement
- Forming and being formed by behavioral patterns
- Models as a system memory



Diamond-Path Framework
Overview

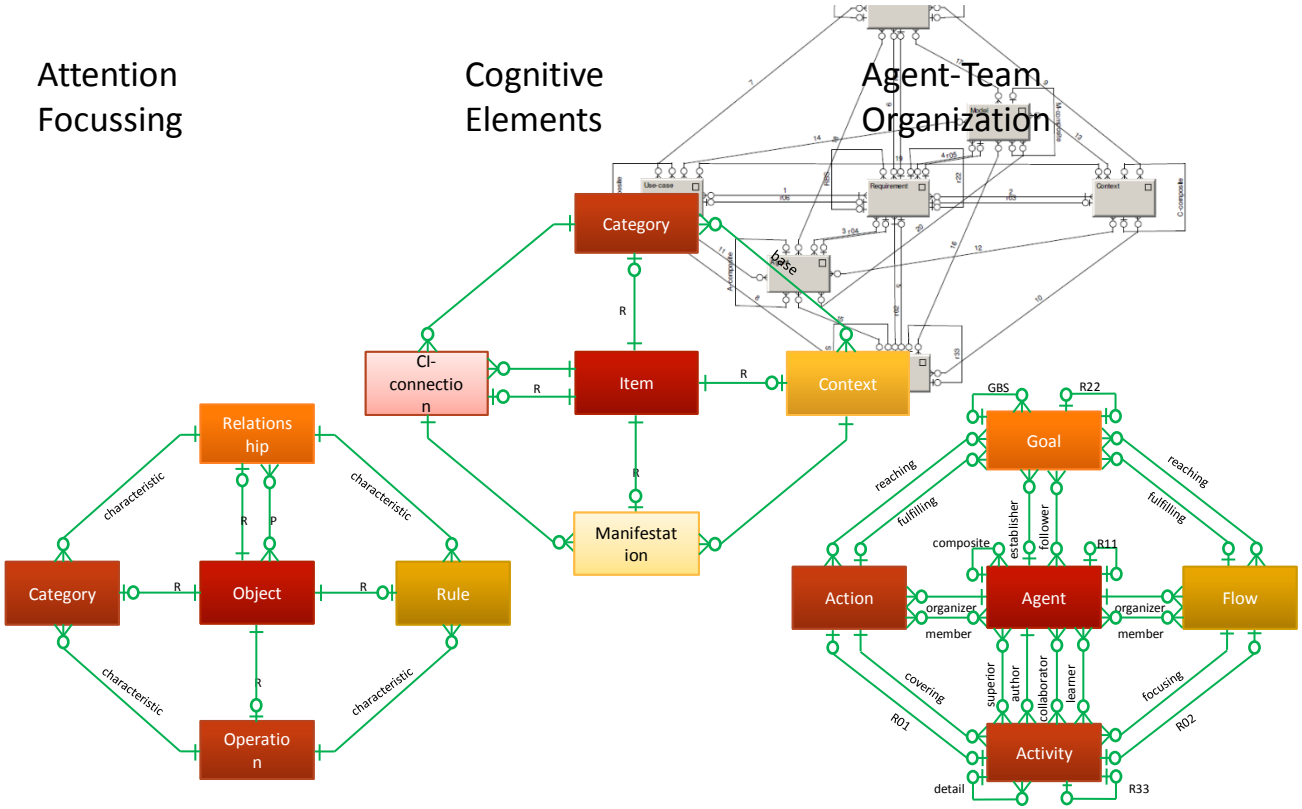
See → Recognize → Organize → Do

Attention Focussing

Cognitive Elements

Agent-Team Organization

Predictive Behaviour



Reflection

- Do you find it interesting?
- And useful?
- Why has it remained a pure theoretical concept?
- Is it too complex?

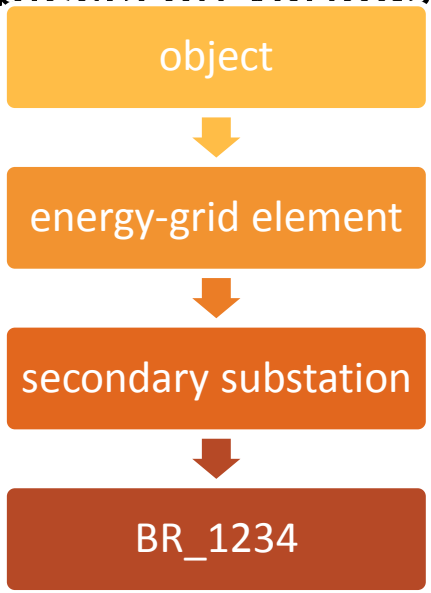
Follow-up Efforts

- Several academical works, none has made it to the business practice

- ...with one exception

GridMind

- Simulation environment designed to benchmark technological solutions of future-energy grids
- Combines objects on various levels of abstraction



- Comprises a number of mental contexts: distribution network, communication network, information scope, devices, technical processes, ...
- Very complex, difficult environment – worth systematical thinking