Adapting activities modelled by the Learning Design Language

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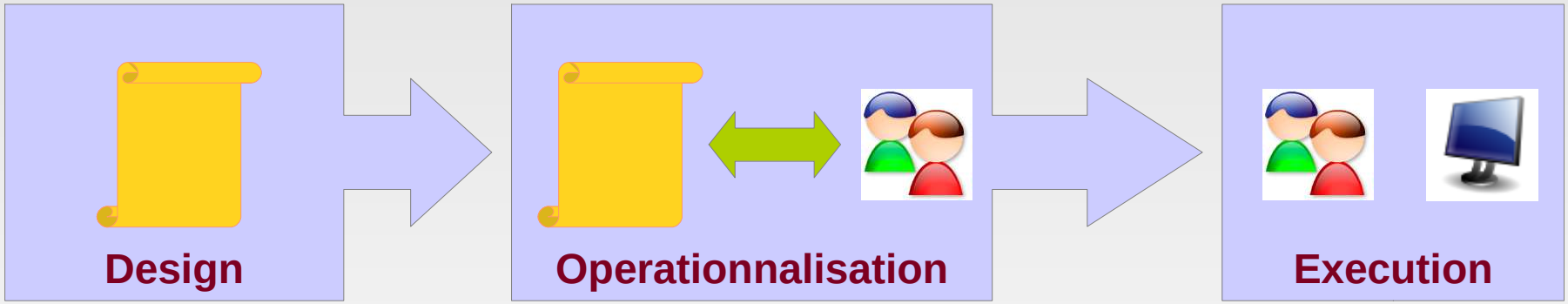
From the model to the activity

Supporting the complete life-cycle

Activity scenario (Model) → execution activity

Cycle



Tools

Learning Design
- **LDL**
- IMS-LD
- LAMS-LD
- ...

Infrastructure
- **LDI**
- CopperCore
- LAMS
- ...

Workspace
- **Web portal**
- Moodle
- ...

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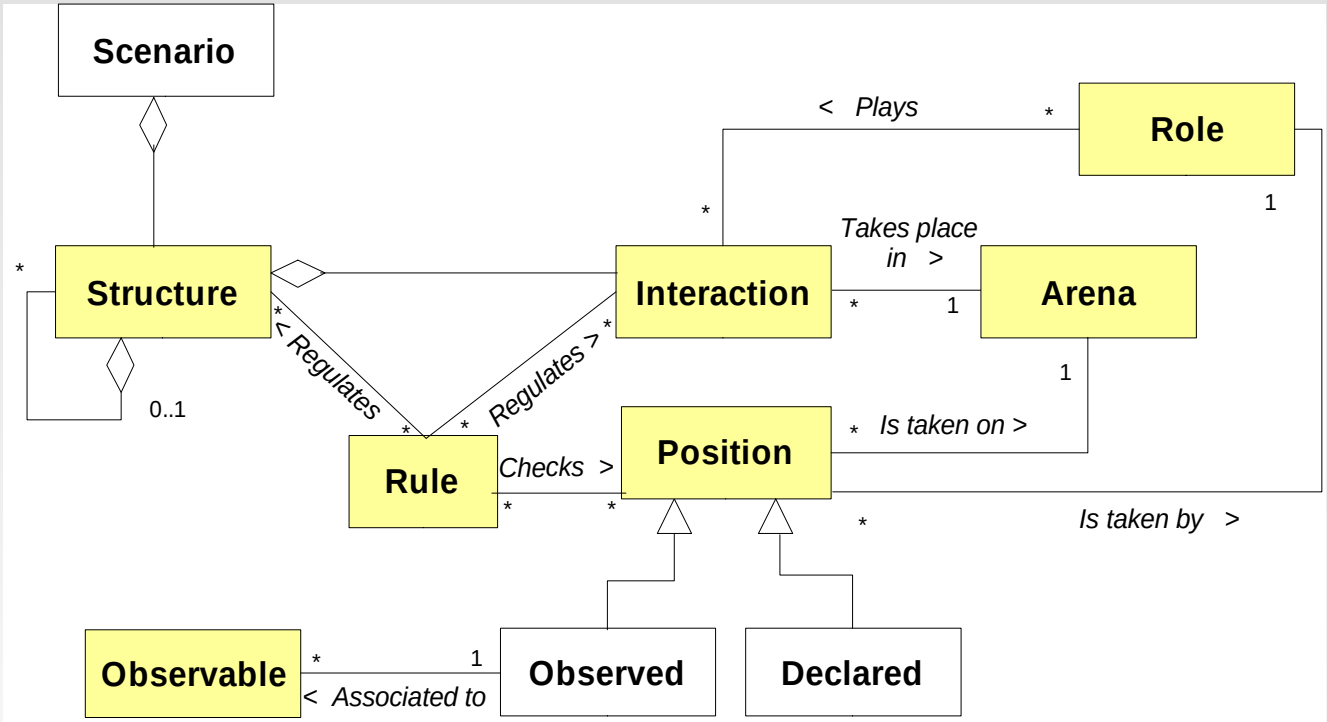
LDL Language concepts

LDL meta-model



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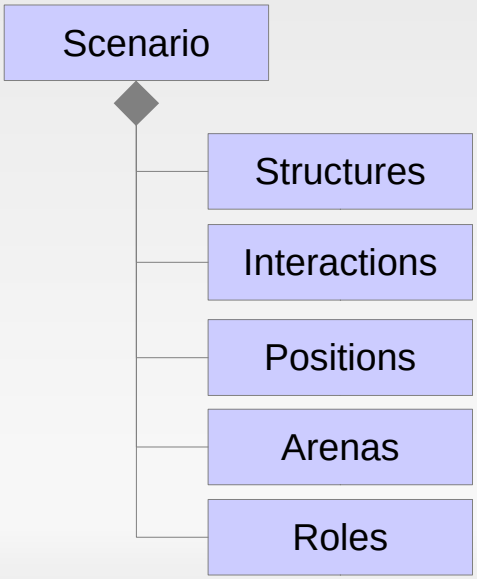
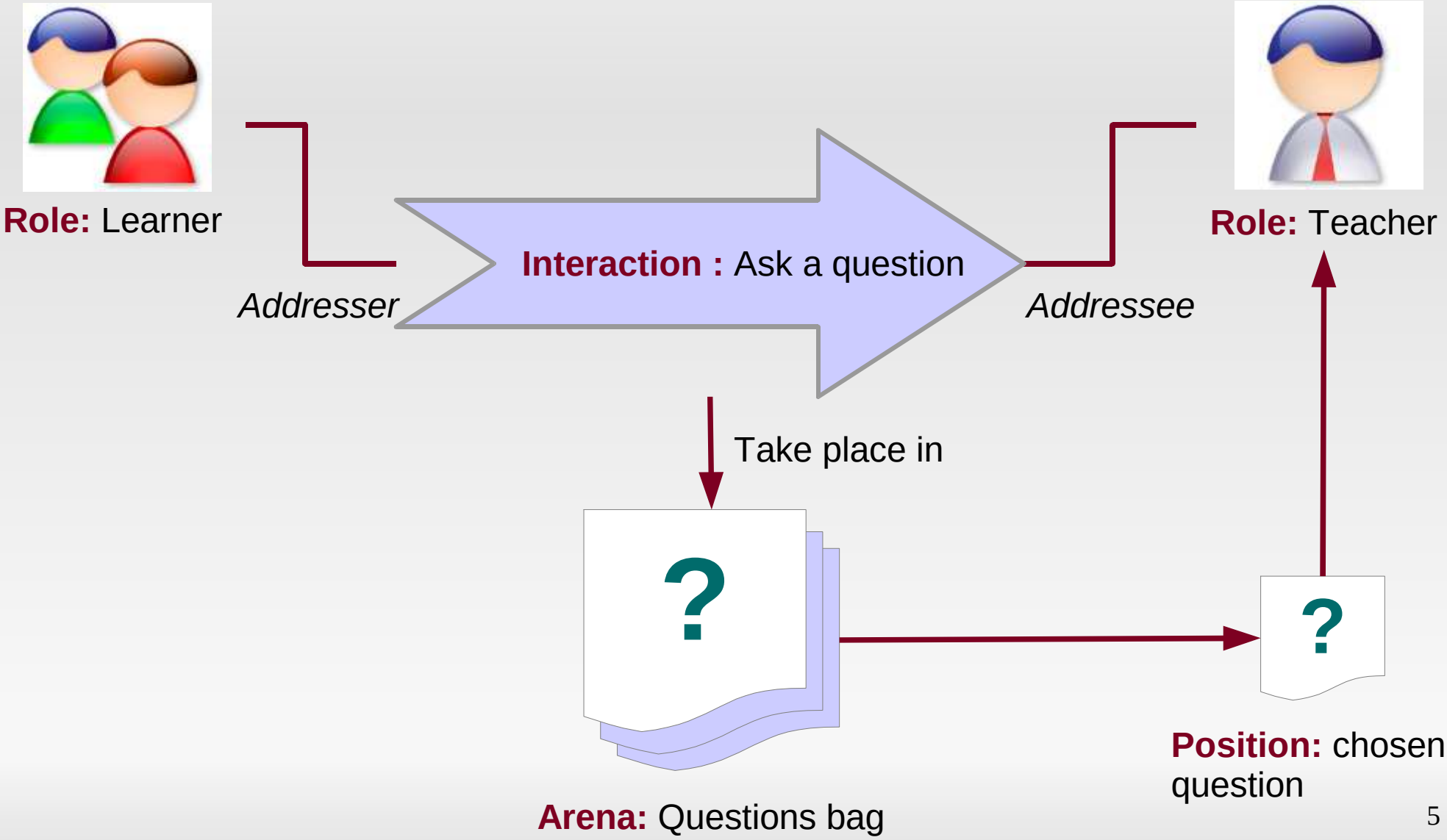


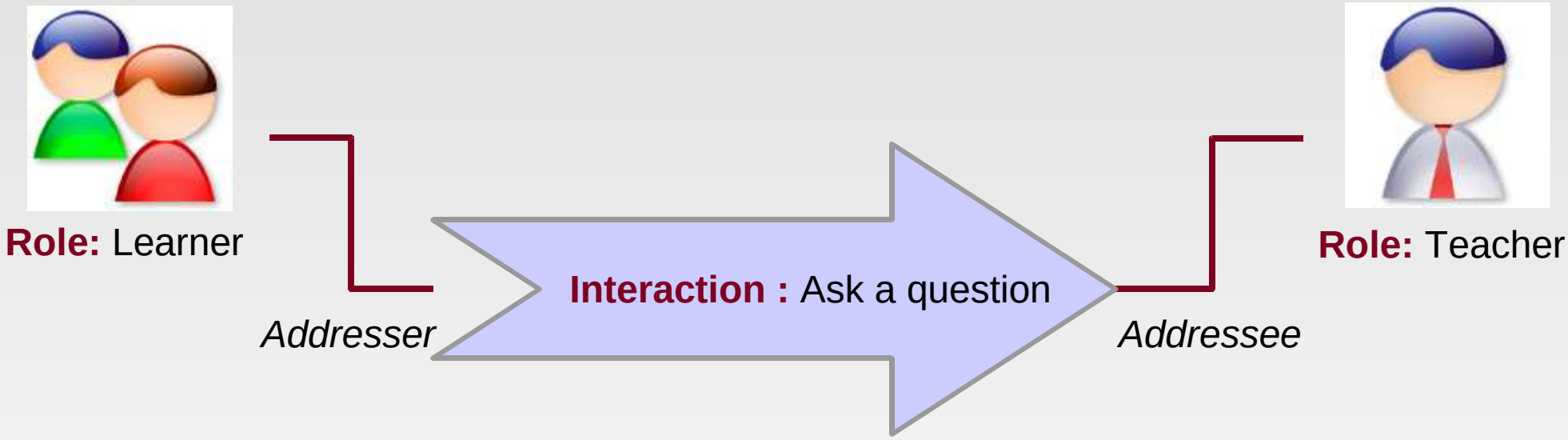
LDL Model (scenario)

LDL Meta-model: interaction



LDL Meta-model: interaction and rules

Start-on Rule: tests some positions



Terminate-on Rule: tests some positions

LDL Meta-model: Position

The way to take into account the participants points of views and positions

examples of positions

- The answer to a question
- The difficulty the participant encounters when solving a problem
- A point of view in a debate
- The mark a teacher assigns to a work
- Etc.

LDL Meta-model: Observer-Observable mechanism

An observable concept can be observed by an observer → All LDL concepts are observable

Different kinds of observers

- Intrusion / Extrusion (in /out an arena)
- Being present/absent (in an arena)
- Answer (to a question)
- A Text (the intervention in a forum)
- A state of an interaction

An interaction can be: visible, started or finished

Observables and Positions for the adaptation

Position + Observables → Observation of the activity

- What is going on in the activity
- When and Where interactions happen
- Who is doing an interaction
- Etc.

The positions and observables are capital for the adaptation

Adaptation → need to be aware of what is going on in the activity

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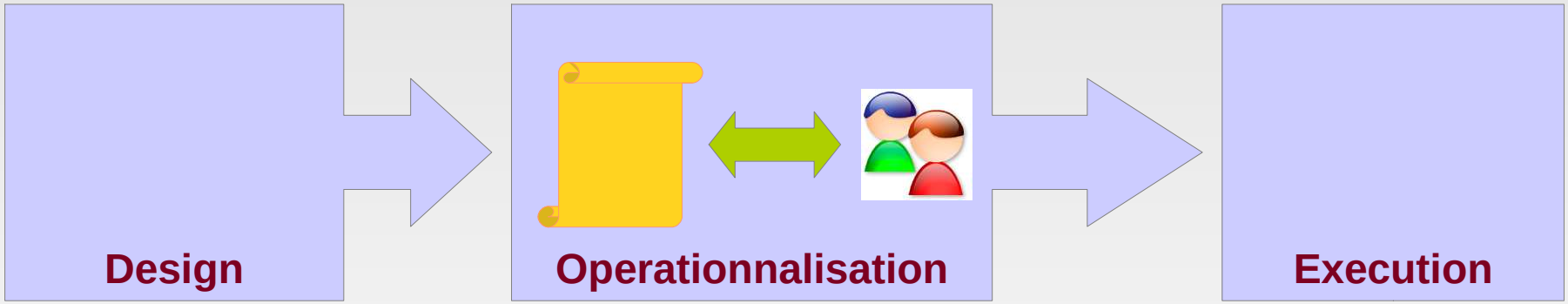
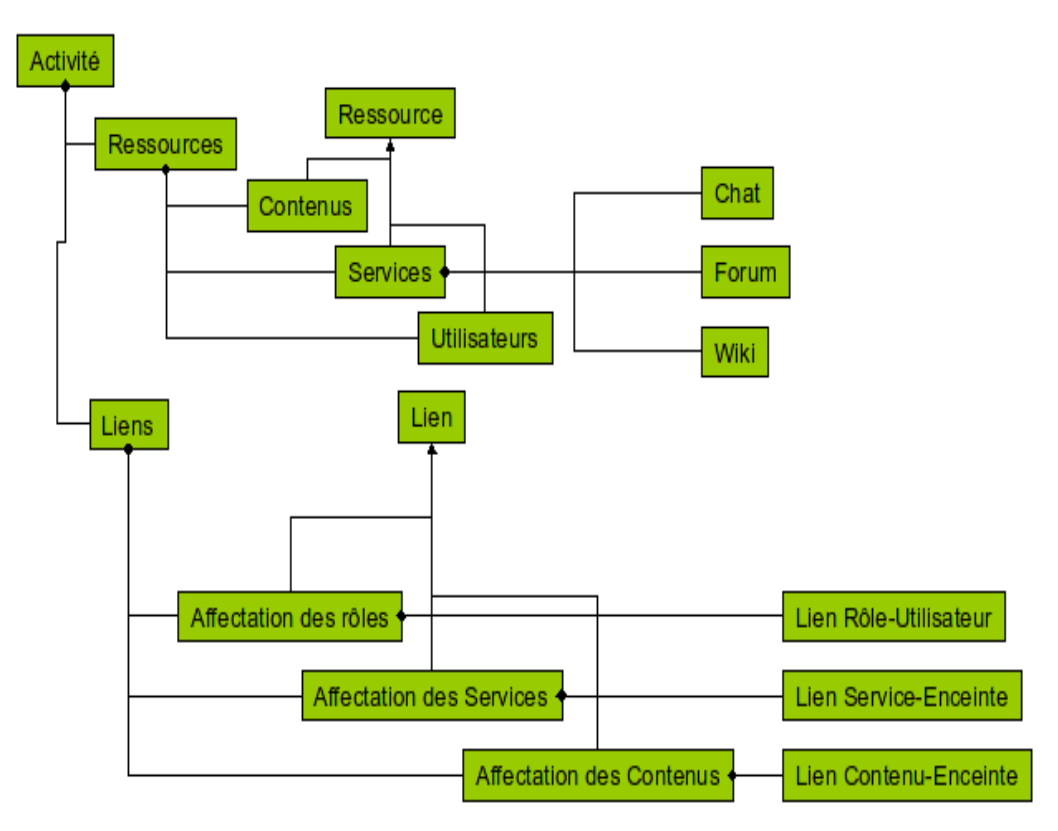


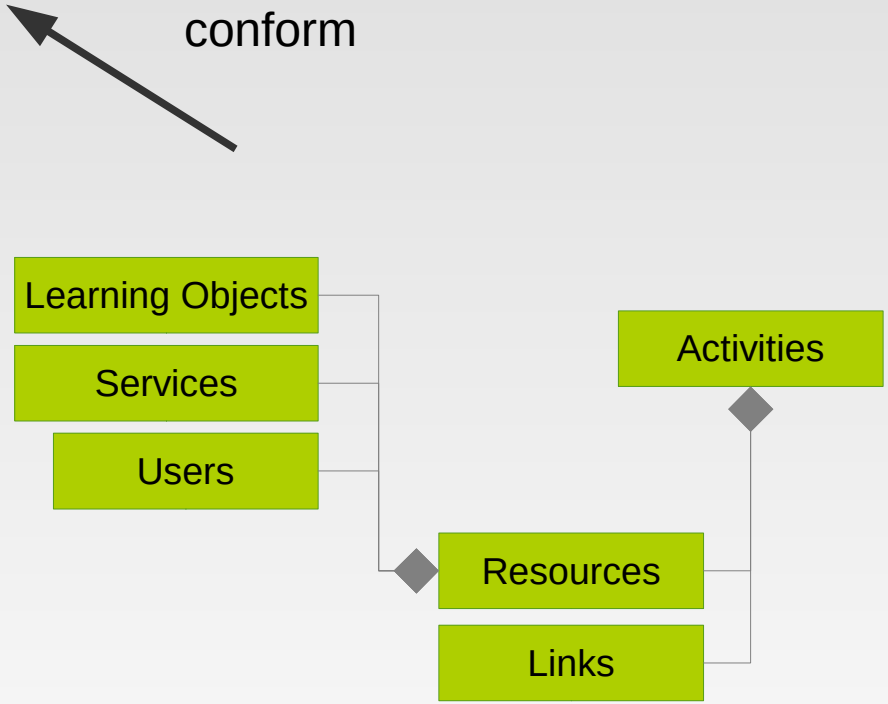
Tools

Learning Design	Infrastructure	Workspace
LDL	**LDI**	**Web portal**
IMS-LD	CopperCore	Moodle
LAMS-LD	LAMS	...
...	...	

Operationnalisation concepts

Operationnalisation meta-model

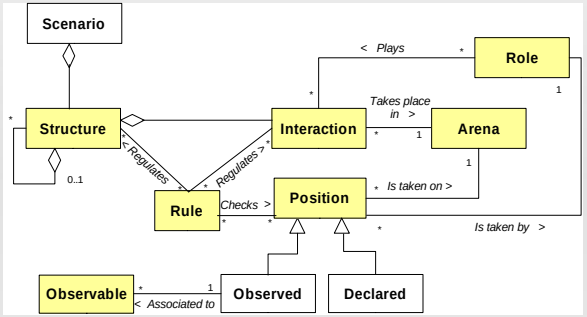




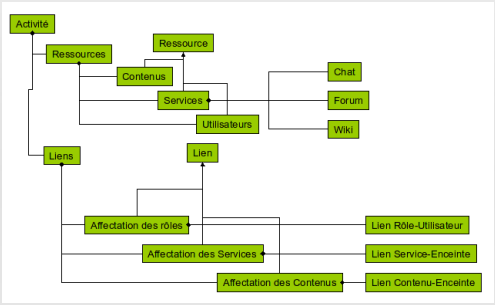
Operationnalisation model

Connection with the LDL concepts

LDL meta-model



Operationnalisation meta-model



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Scenario

Structures

Interactions

Positions

Arenas

Roles

Arenas ↔ LO

Arenas ↔ Services

Roles ↔ User

Learning Objects

Services

Users

Activities

Resources

Links

LDL Model (scenario)

Operationnalisation model

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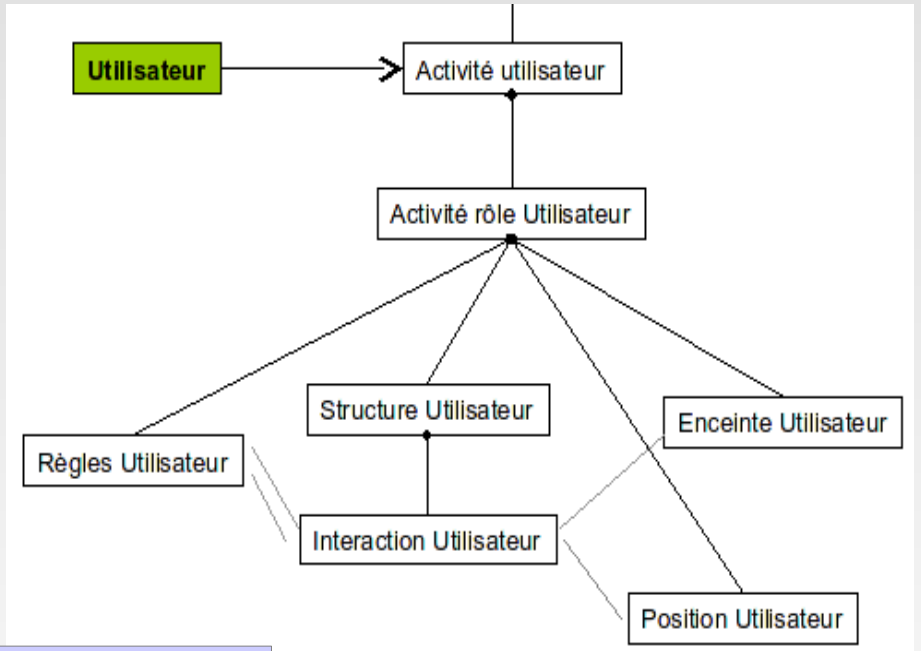
Execution concepts

The state of the activity for each participant:

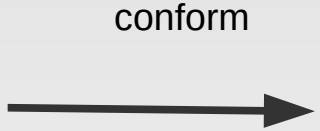
State of the activity meta-model

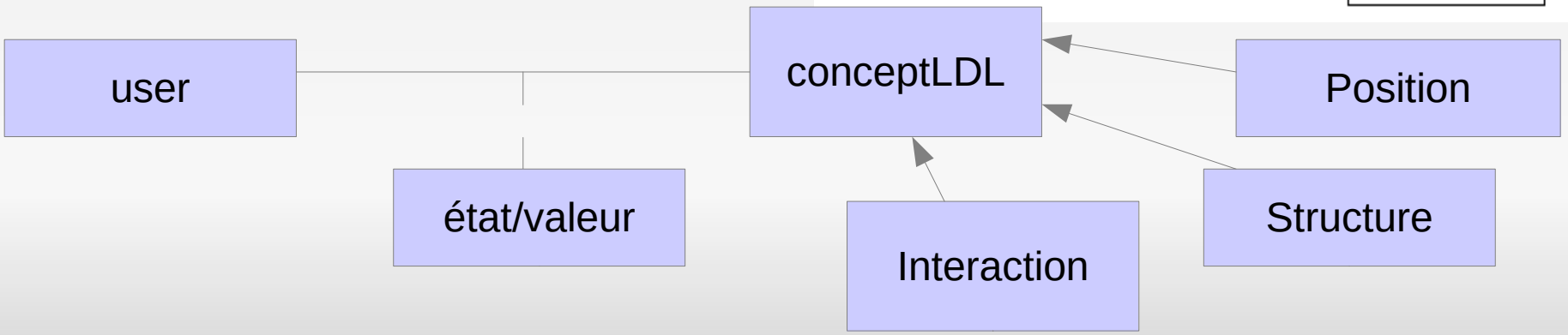


Model of the activity state

- Structures states
- Interactions states
- Positions values

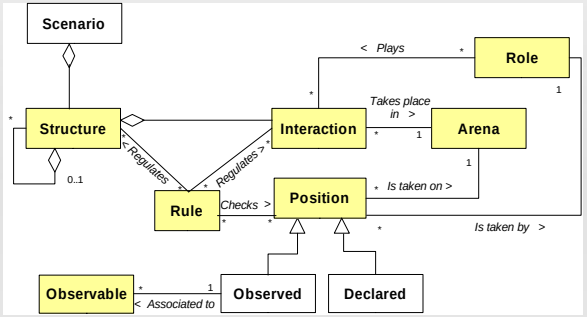
conform





Conjunction of the three models

LDL meta-model



conform

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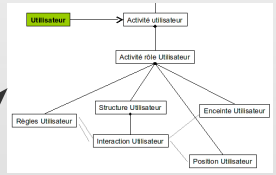
LDL Model (scenario)

State of the activity meta-model



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Model of the activity state

Structures states

Interactions states

Positions values

Arenas ↔ LO

Arenas ↔ Services

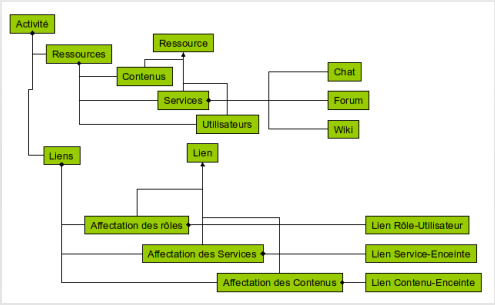
Roles ↔ User

Learning Objects

Services

Users

Operationnalisation meta-model



conform

Activities

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Links

Operationnalisation model

Modeling a scenario: the four pillars methodology

Considering that teaching is based on 4 « pillars » :

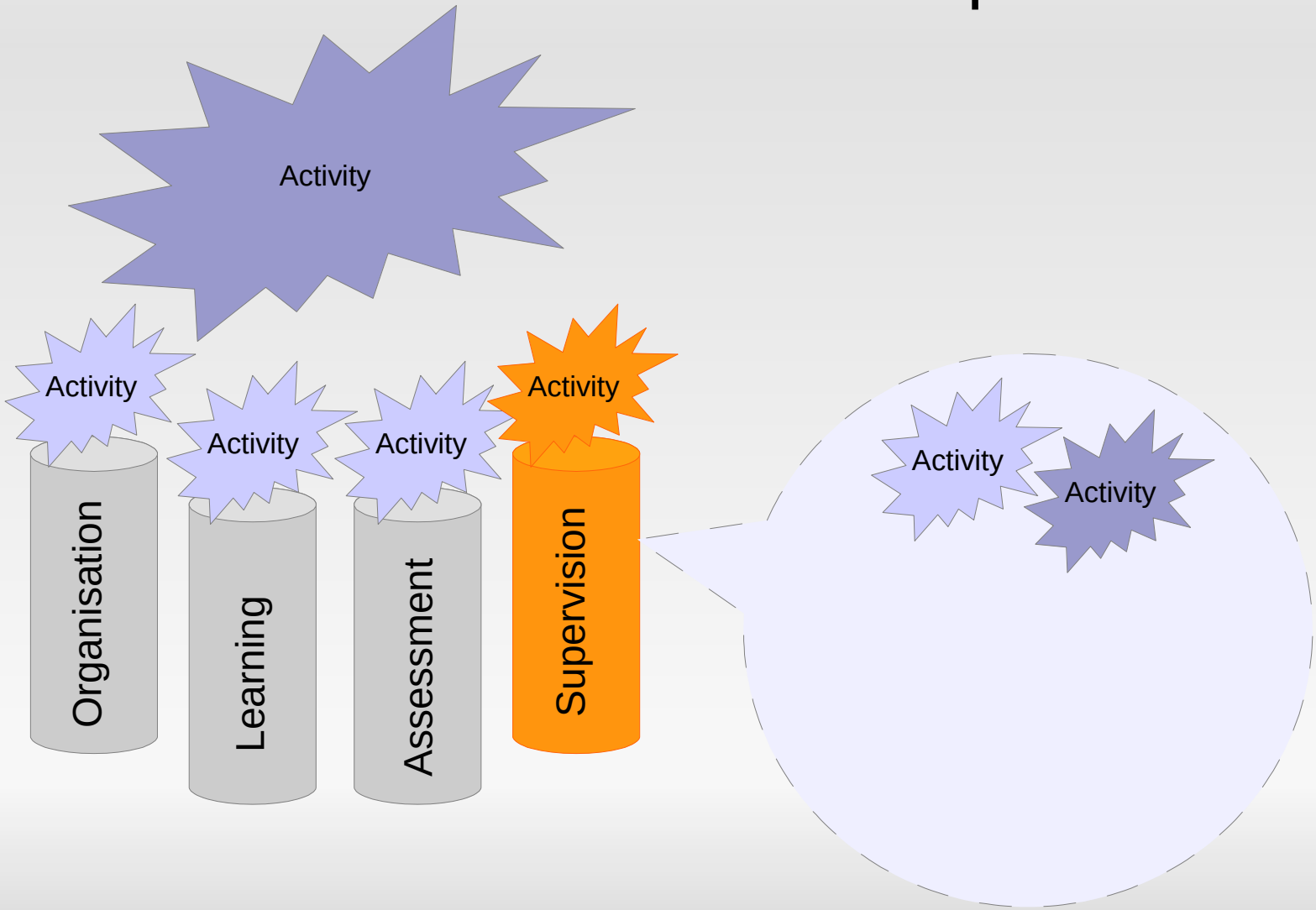
- Organisation,
- Learning,
- Supervision/Observation,
- Assessment.

LDL → a scenario (model) for each pillar

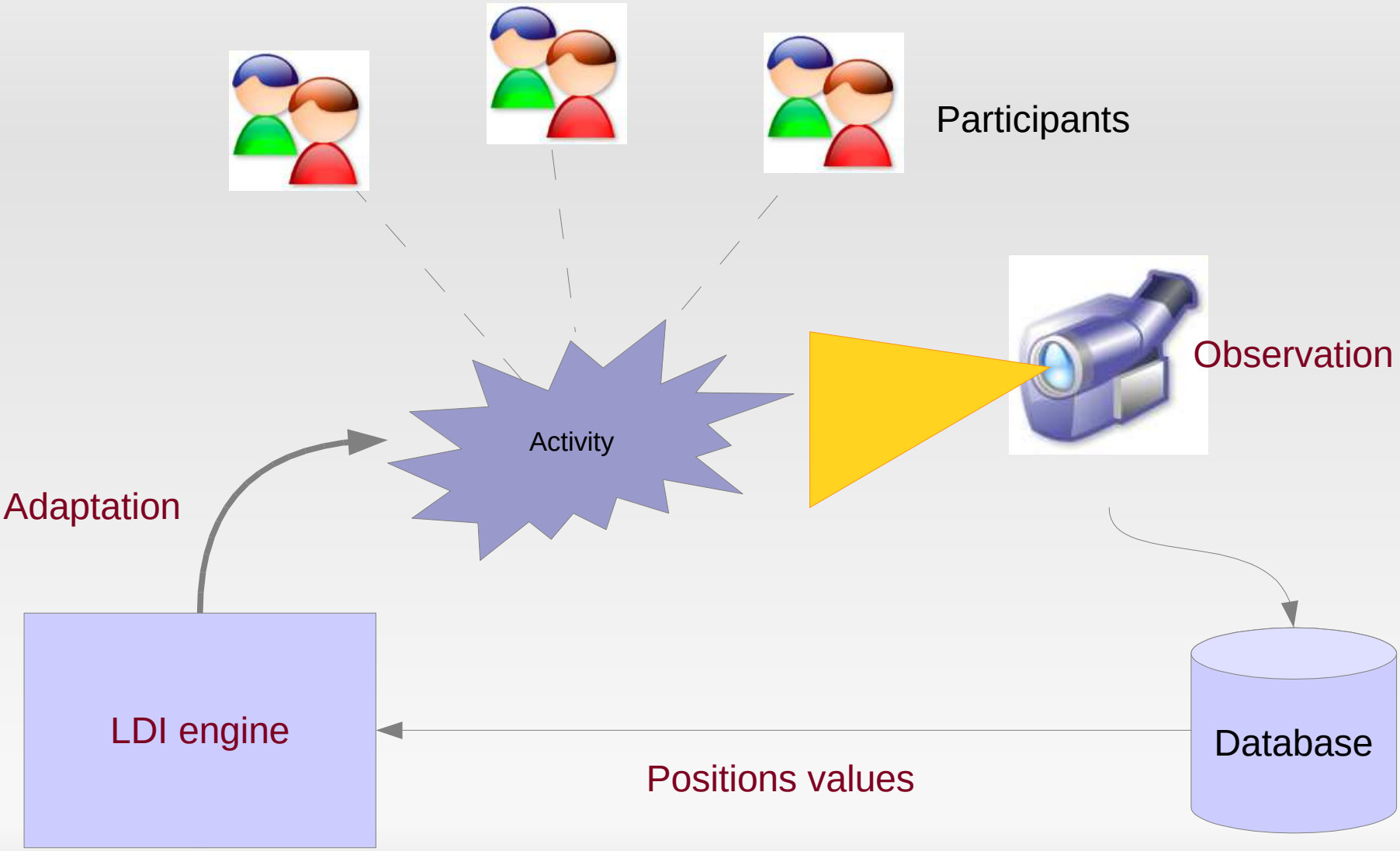
- Organisation scenario
- Observation scenario
- Learning scenario
- Assessment scenario

4 « pillars » methodology: supervision

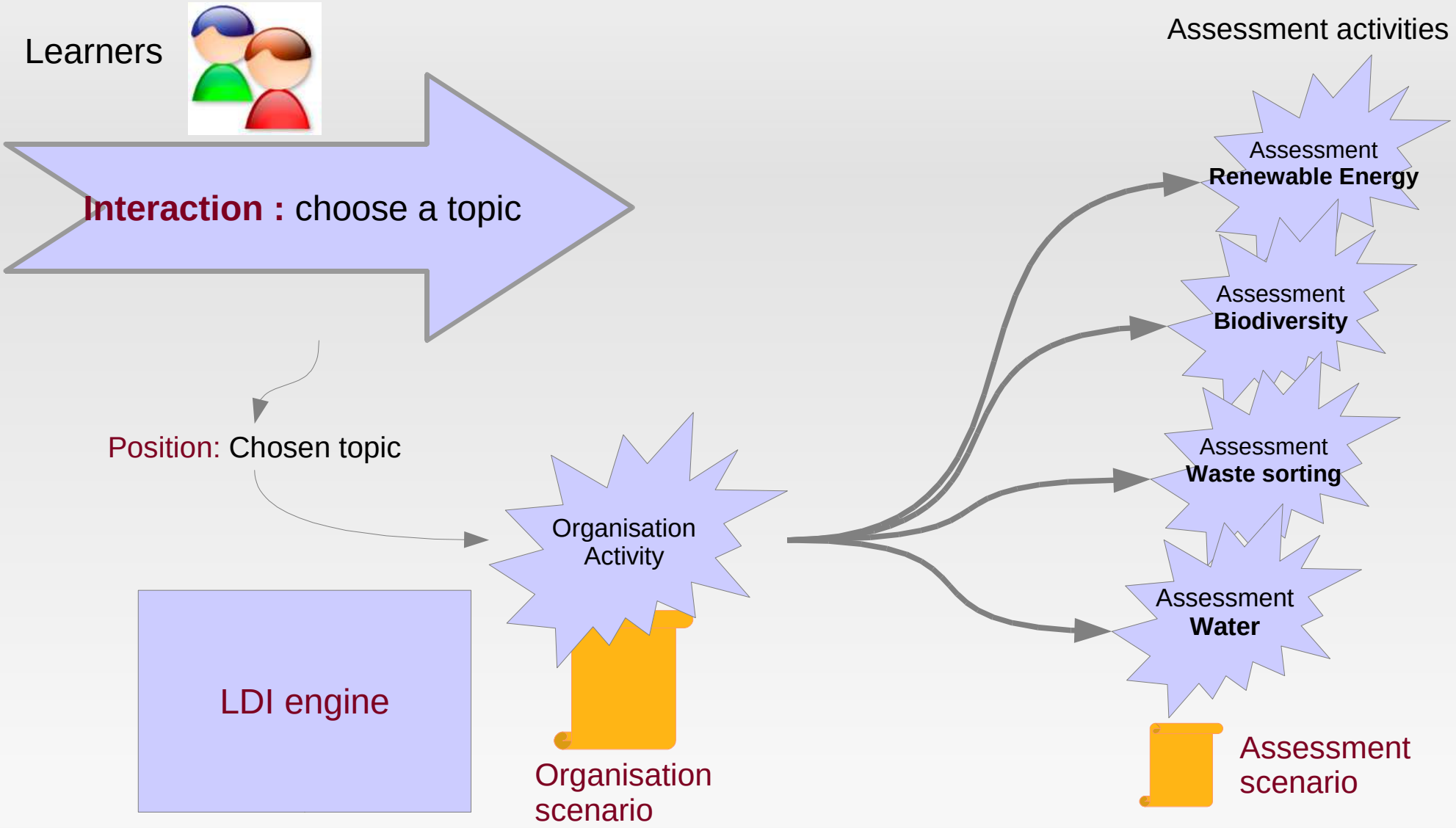
Supervision → Observation and Adaptation



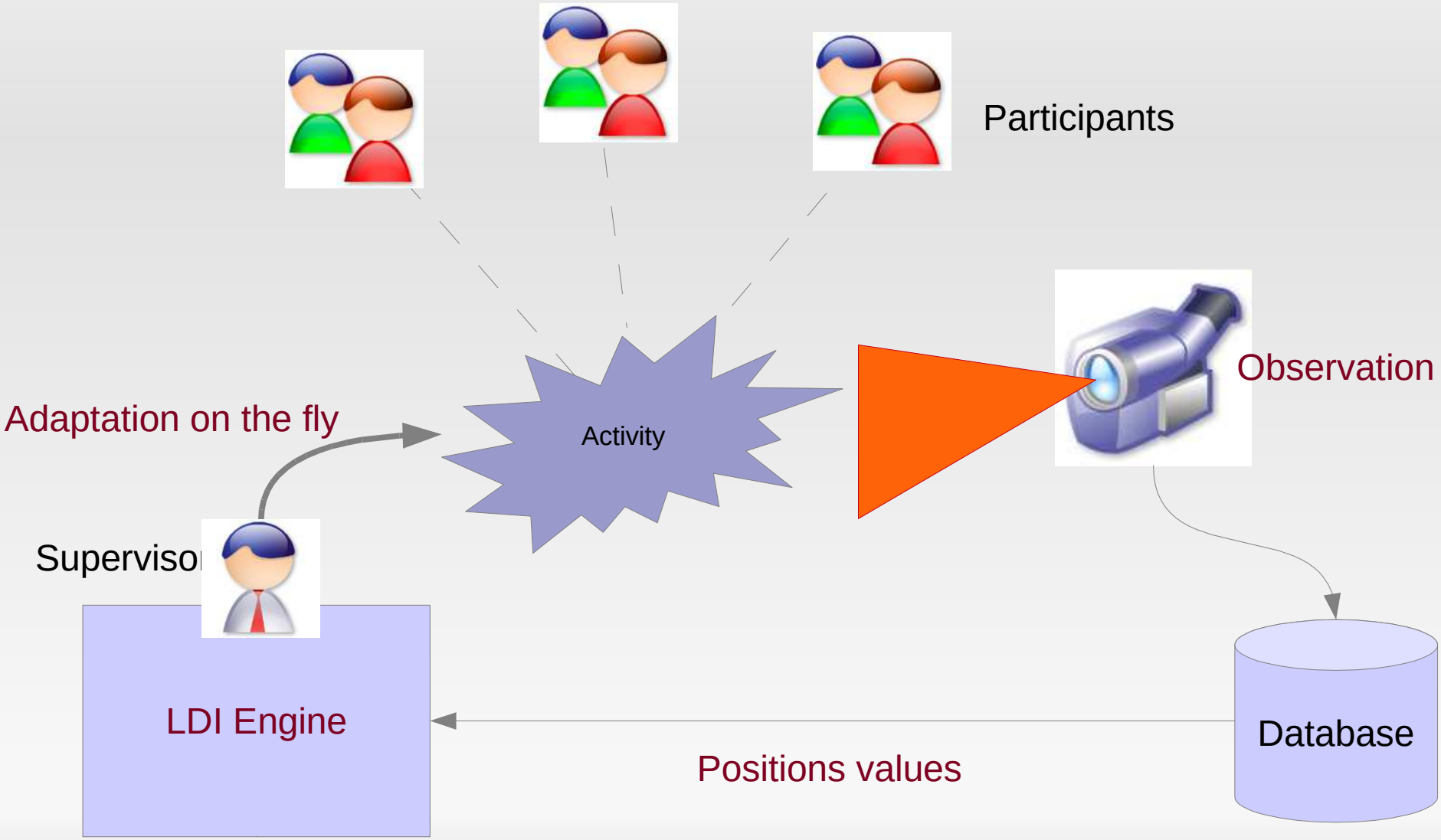
Observables and Positions: predefined adaptation



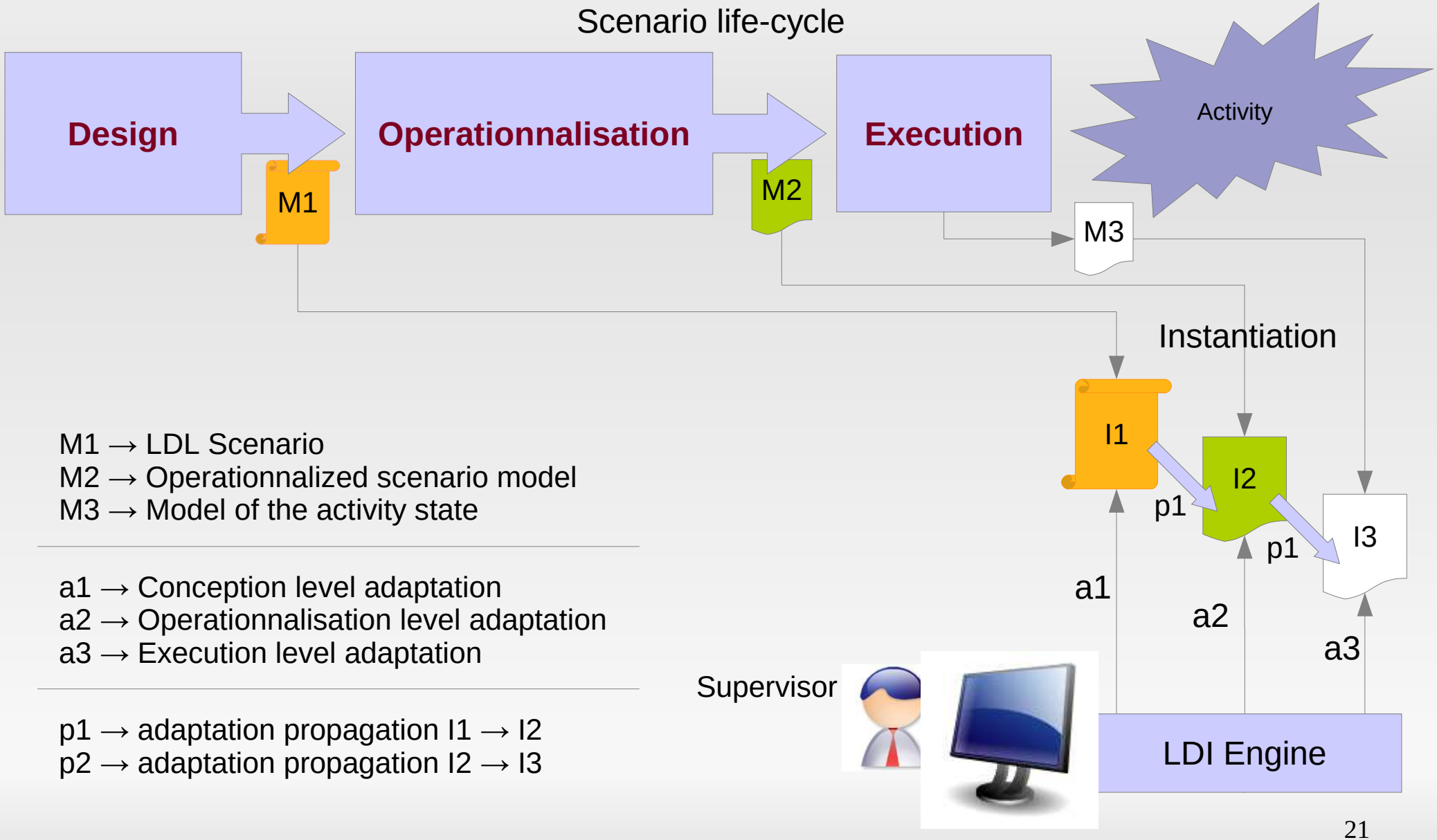
predefined adaptation: case study



Observables and Positions: adaptation on the fly



Three models, three levels for the adaptation on the fly



M1 → LDL Scenario
M2 → Operationnalized scenario model
M3 → Model of the activity state

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a1 → Conception level adaptation
a2 → Operationnalisation level adaptation
a3 → Execution level adaptation

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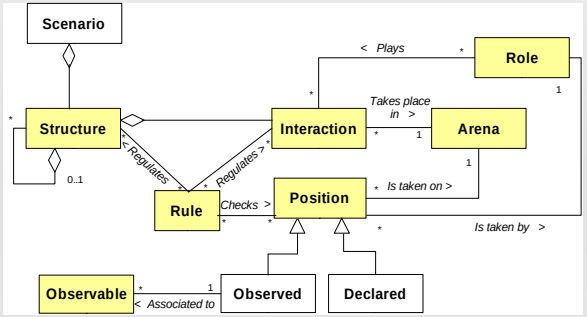
p1 → adaptation propagation I1 → I2
p2 → adaptation propagation I2 → I3

Conjunction of the three models

LDL meta-model



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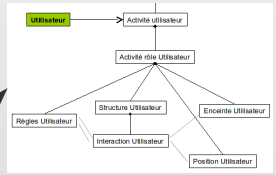

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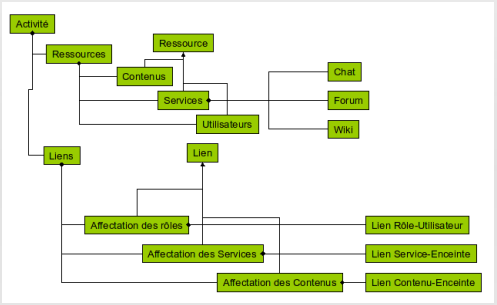
Operationnalisation meta-model



Model of the activity state

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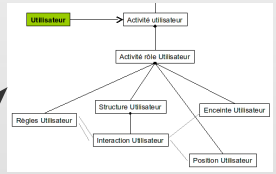
LDL Model (scenario)

Operationnalisation model

Execution level adaptation: case study

State of the activity meta-model



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Model of the activity state

Structures states

Interactions states

Positions values

Adaptation on the fly

Supervisor

LDI Engine

Structure visibility

Interaction visibility

Positions values

The learning flow

Execution level adaptation: case study

Make visible an interaction/structure for a leaner → change his location in the learning flow

Example

Change the location of a new added learner → move the learner from the second step “Assessment activity” to the third step “Learning activity”

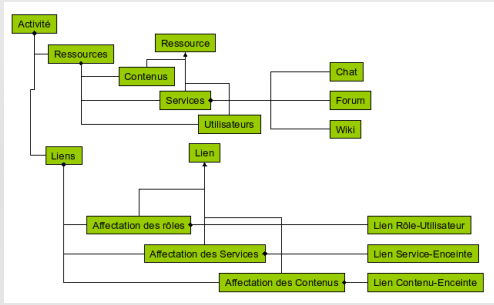
Change the values of the positions → change a learner answer

Example

A wrong chosen topic in the first step “Chose a topic” → change the value “chosen topic”

Operationnalisation level adaptation: case study

Operationnalisation meta-model



Change the affectations
- Add a new user
- Add a new service
- Replace a learning object
- Etc.

conform

Learning Objects

Services

Users

Activities

Adaptation on the fly

Supervisor

Arenas ↔ LO

Arenas ↔ Services

Roles ↔ User

Resources

Links

LDI Engine

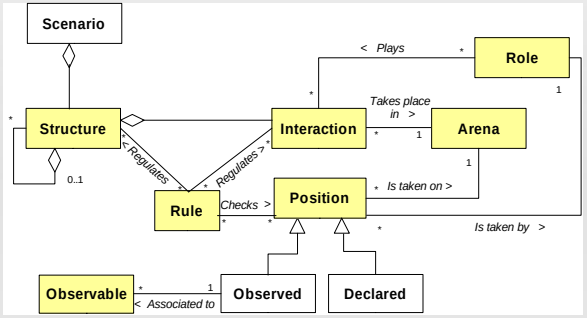
Operationnalisation model

Operationnalisation level adaptation: case study

- Operationnalisation adaptation → change the affectations
  - Participants/User ↔ Roles
  - Arenas ↔ Services and Learning objects
- Example
  - Add a new participant to the activity → user role affectation
- Propagation
  - Execution level adaptation → move the new added participant directly to the second step

Conception level adaptation: case study

LDL meta-model



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Scenario

- Structures
- Interactions
- Positions
- Arenas
- Roles

LDL Model (scenario)

Adaptation on the fly

LDI Engine

- Add a concept
- Delete a concept
- Modify a concept

Supervisor

Conception level adaptation: case study

Conception level adaptation → add, remove or modify a concept

Example

- Add a new role “Expert” to the activity → the expert will be invoked in the third step “learning activity”

Propagations

- Conception level → Associate interactions to the new add role
- Op level adaptation → affect the new added role to a participant
- Execution level adaptation → control state of the

On line demonstration with LDL and LDI