A PATTERN-BASED AND TEACHER-CENTERED APPROACH FOR LEARNING DESIGN

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Presentation Plan

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    3. Design Context

    4. Design Process

    5. Editor of pedagogical scenario

IV. Case of Study

V. Conclusion

Introduction (1/2)

- Domains of interest
  - The activity of design of educational scenarios
  - The pattern
  - The instrumentation of the approach
  - The adaptation of the design

- Existing approaches
  - IMS-Learning Design [Koper et Tattersall, 2005]
  - The approach of modelling based on Educational Modeling Languages (EML) as LDL [Vignollet et Al, 2006]
  - The definition of an EML define by the user [El Kechai, Choquet, 2007]
  - The Approaches by the pattern
    - Coming from the Software engineering
    - Adapted for the educational design [Mor, 2010]
    - Already tried in the domain
      - COLLAGE [Hernandez-Leo et Al, 2006]
      - MDEduc [Moura et al, 2007]

Introduction (2/2)

- Reports
  - Activity of design becomes more important for the teachers / trainers [Laurillard, 2012]
  - Capitalization and re-use limited of pedagogical scenario in the communities of learning [Roberston, 2006]
  - Limits of the existing approaches of educational design

- What mechanisms of assistance to supply in a teaching / formative to design and implement scenarios of instrumented situations of learning answering its own requirements, while assuring the sharing and the re-use of the scenarios designed within practitioners' communities ?

- Methodology : Research-action

- Our proposal : an approach with patterns, using the DSM approach and adaptive

Research Question

- What is the feasibility of an approach of design with patterns which supports the creation and the re-use of educational scenarios by teachers / trainers?

- Feasibility: the technical feasibility of the approach by the prototype

- Usability and Acceptability: criteria studied during the experimentation of the approach

An approach based on Patterns centered on the Teacher

▸ Objective

  ○ Propose to the teachers-designers an assistance during their activity of design which adapts itself to their profile, more generally to their context of design

▸ Our approach

  ◦ EML define with Language of the user
  ◦ Based on Patterns
  ◦ adaptation to the activity and the context of the designer

▸ Implementation

  ◦ Authoring Tool
  ◦ Domain Specific Modeling (DSM) [Kelly, Tolvanen, 2008]

# An approach based on Patterns centered on the Teacher
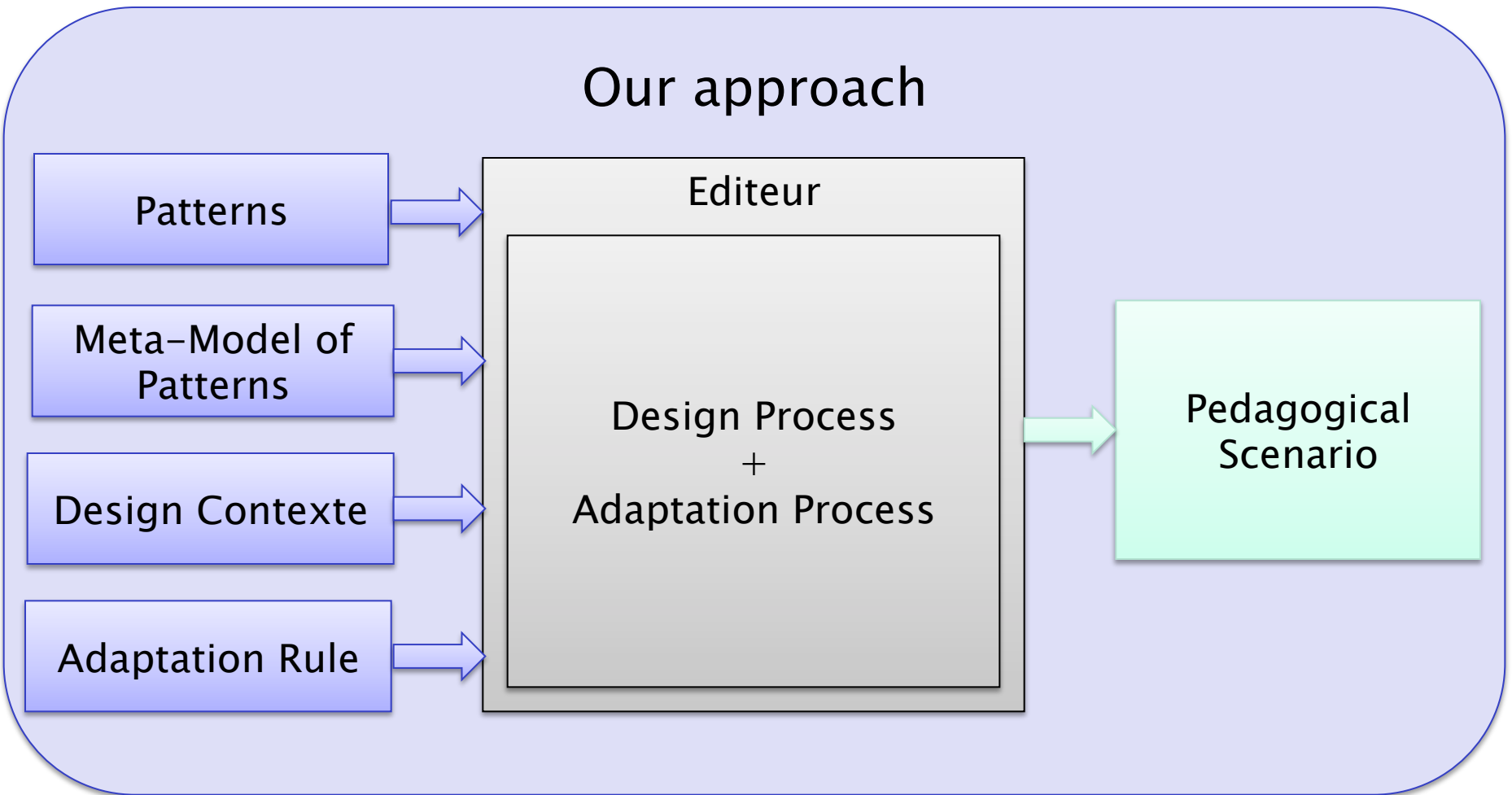
Meta-Model of Patterns

▸ Meta-Model of Patterns

◦ Described the language allowing to compose or to merge patterns

◦ Described 4 types of patterns used in the approach

- *Pedagogical Patterns* –> Pédagogical Objectives / Stratégies

- *Analysis Patterns* –> Resources (material or human)

- *Process Patterns* –> Activities

- *Design Patterns* –> Learning Situation

Define from the formalisms coming from the literature

Meta-Model of Patterns

▸ Meta-Model of Patterns
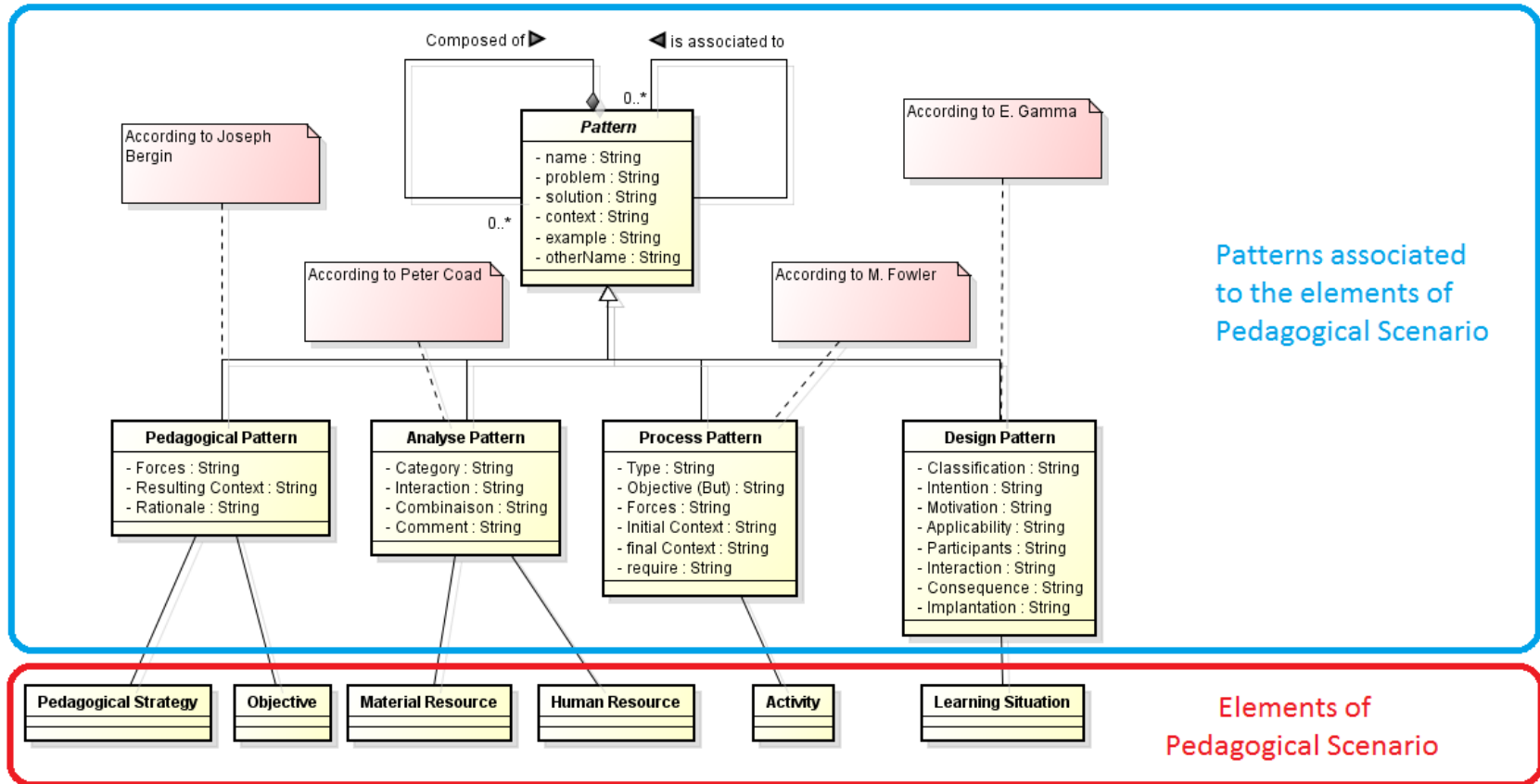
Design Context

▸ The design context is composed of 5 facets

1. The User Profile (the information on the user and his preferences)
2. The Learning context (the learning strategies defined by the designer)
3. The Institutional context (the constraints and the limits stated by the institution)
4. The Domain (the concepts of the learning domain)
5. The Context of use(User Actions during the design session)

• The design context is fed by indicators (UTL) [Choquet, Iksal, 2007], forms were filled by the user and the configuration of the user.

• 1 indicator can be connected to several facets

Design Context

▸ Example of indicator

  ◦ Indicator connected to the facet "Domain"

  ◦ Name : « Concept in the Domain Vocabulary »

  ◦ Method of indicator : Verify if a concept, used as a property to qualify a given pattern, is a part of the facet "domain" current

▸ This method is implemented according to a simple rule " if the current concept is in the vocabulary, to search a pattern containing this term "
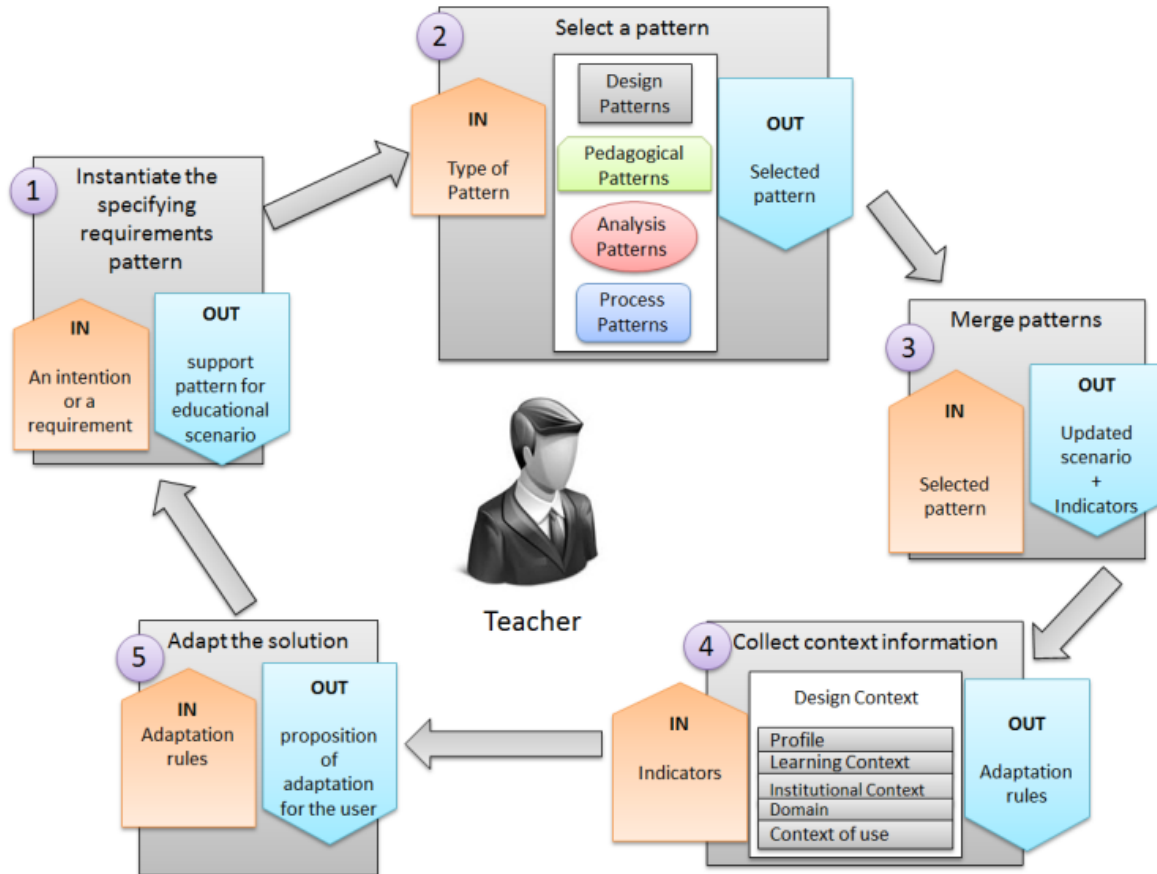
Design process

▸ Cycle is iterative and in 5 steps

1 – Instantiate the specifying requirements pattern

2 – Create or Select a pattern

3 – Merge or compose patterns

4 – Collect context Informations

5 – Adapt the solution

Editing tool

▸ A generated tool

  ◦ By the technology EMF-GMF

  ◦ From the meta-model of patterns

  ◦ With a specific visual language in the domain

▸ Spécifications of the tool

  ◦ In compliance with the design process

  ◦ Adaptation to the activity and to the design context

Editing tool

- A – The graphic solution

- B – The toolbar

- C – The properties of current pattern

Cas d'étude (1 /2)

Step 1 : The teacher specifies his pedagogical need

The teacher defines activities, resources material and human, as well as objectives for the preparation of the session. The name of the session is « Dynamic behavior of a mechanical charge »

Step 2: The teacher selects an element for his scenario

The teacher describes his educational scenario from the situation of learning,
The editing tool proposes a set of situations of learning.
The teacher refines his search with the criteria "lab work" and "implement".
The most relevant choices are proposed in the first one in the list.
The teacher chooses the learning situation "Implementation for a lab work".

Cas d'étude (2/2)

Step 3: The tool adds the pattern to the solution.

The editing tool adds the pattern chosen in the graphic representation of the solution. The scenario is updated with this new pattern.

Step 4: The tool collects the information on the context and the activity of design.

Indicators observing the concepts used to re-order sets of learning situation proposed by the tool are updated.
The activity of design of a "creation of a learning situation" is recognized.

Step 5: The teacher chooses to apply the adaptations proposed by the tool.

The tool according to the activity and to the context of design updated search of the adaptations.
The tool suggests adding the new concepts to set of concepts proposed by the tool to re-order sets of learning situation.
The teacher confirms the proposal.

Conclusion

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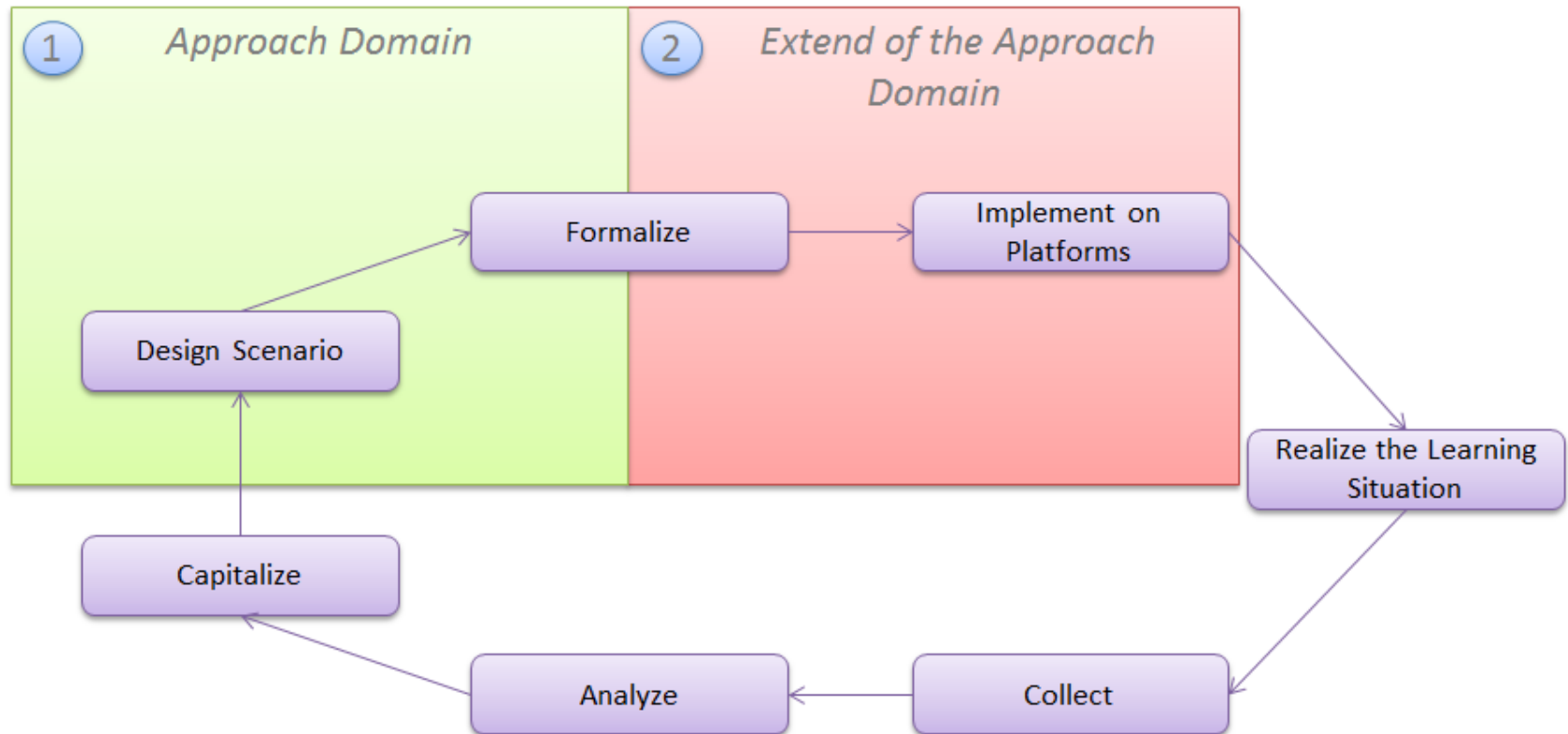
Conclusion

▸ ## Our proposals
◦ An approach and a methodology of design
  · Based on the pattern
  · Centered on the teacher
◦ A tool to show the feasibility of the approach

▸ ## Our perspectives
◦ A process of adaptation to the activity and the context of the designer
◦ Complete Implementation of the approach
◦ Test of the prototype and the methodology

Thank you for your attention

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