**Towards Contextualizing Agile Processes Decision Making**

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# Towards Contextualizing Agile Processes Decision Making

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# OUTLINE

1. Problem Statement

2. Research Goal

3. Background: Guiding approaches for Agile adoption

4. AM-QuICk Approach

   - Overview

   - Process Modeling

   - Context Modeling

   - Illustration

5. Conclusion: Future Work and Threats of Validity

# INTRODUCTION

- Widespread adoption of Agile processes as a way of achieving **efficient** Software engineering:
    - avoid waste by focusing on **customer needs** and on **effective collaboration**
    - **maximizing value continuously**
- Growing community

## but still many barriers for further adoption …

*Source: State of Agile Survey, Version One, 2013*
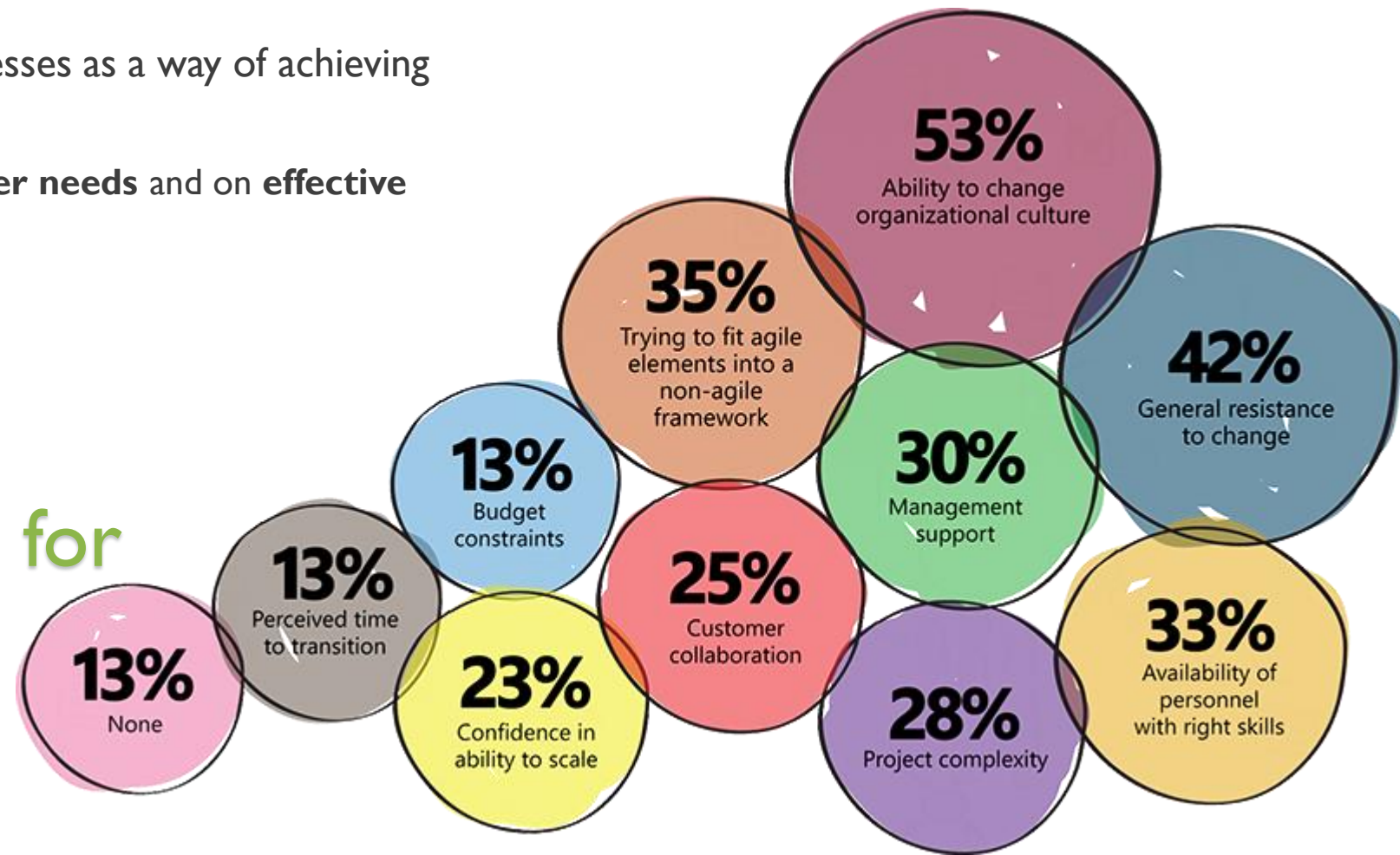
# PROBLEM STATEMENT:
## AGILE ADOPTION BARRIERS – LITERATURE REVIEW

1. **Lack of evidence, and so confidence**
   - How to measure the impact of practices introduction?
   - What indicators : statistics and data to prove evidence?

2. **Unsuited Environment**
   - How much Agility is required?
   - How to scale? How to assess the ability of scaling Agile?
   - What are the influencing environmental factors?
   - How can we measure them?

3. **Profusion of practices and techniques**
   - How to know / assess which are more suitable? more beneficial?



**How Agile Are Organizations Today?**

AGILE PROJECT MANAGEMENT ADVISORY SERVICE

Executive Report, Vol. 7, No. 12

by Jim Highsmith, Director, Cutter Consortium's Agile Project Management and Dr. Robert K. Wysocki, Senior Consultant, Cutter Consortium

OVERVIEW

The agile movement is now more than five years old, measured from the authoring of the Agile Manifesto. In this time frame, many organizations have implemented agile methods, with many more planning agile transitions. Previous Cutter (and other) surveys have addressed questions about how organizations are using agile methods, what particular flavor of agile is being used, or whether agile methods result in higher-quality software, but we thought it was time to ask a
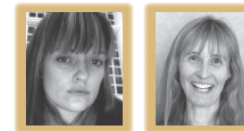
in the organization are agile, or that project teams are agile but management practices have yet to change. So we wanted to test these aspects of agility.

It is difficult in a short survey to get a complete picture of whether an organization is agile, but the level of implementation of certain practices can provide a good indication. Thus, we asked respondents to think about practices across their entire organization, not just for a project team or two. Instructions for the survey were as follows:

**The Top 10 Burning Research Questions from Practitioners**

Sallyann Freudenberg and Helen Sharp

What research do software practitioners really want? Software practitioners frequently complain that academic research doesn't meet their requirements or expectations—in short, that researchers are wasting their time. At the XP 2010 conference in Trondheim in June, this question was met head-on in the context of agile software development in a panel entitled "Is Agile Research Dead in the Water?" The panel and audience identified a worrying disconnect between the research that

- Agile and large projects. (7)
- What factors can break self-organization? (6)
- Do teams really need to always be collocated to collaborate effectively?* (6)
- Architecture and agile—how much design is enough for different classes of problem?* (6)
- Hard facts on costs of distribution (in $, £, €, and so on). (5)
- The correlation between release length and success rate. (5)
- What metrics can we use with minimal side-effects? (5)
- Distributed agile and trust—what happens around 8–12 weeks?* (4)
- Statistics and data about how much money/time is saved by agile. (4)
- Sociological studies—what were the personalities in successful/failed agile teams?* (4)

**AGILE TECHNIQUES EMPLOYED**

Core agile tenets currently in use are* Daily Standup, Iteration Planning and Unit Testing. Most notable is the increasing use of Kanban (24%). *Respondents were able to select multiple options.

| | | | |
|---|---|---|---|
| A | Daily Standup | N | Story Mapping |
| B | Iteration Planning | O | Digital Taskboard |
| C | Unit Testing | P | Pair Programming |
| D | Release Planning | Q | Collective Code Ownership |
| E | Burndown | R | Automated Acceptance Testing |
| F | Retrospectives | S | Kanban |
| G | Continuous Integration | T | Onsite Customer |
| H | Automated Builds | U | Continuous Deployment |
| I | Velocity | V | Analog Taskboard |
| J | Coding Standards | W | Agile Games |
| K | Refactoring | X | Cycle Time |
| L | Test-Driven Development TDD | Y | Behavior-Driven Development BDD |
| M | Open workarea | | |

A 78%
B 74%
C 70%
D 65%
E 64%
F 64%
G 54%
H 53%
I 52%
J 51%
K 48%
L 38%
M 38%
N 35%
O 32%
P 30%
Q 28%
R 25%
S 24%
T 24%
U 24%
V 22%
W 15%
X 12%
Y 9%

# PROBLEM STATEMENT:
## AGILE ADOPTION BARRIERS – IN-VIVO OBSERVATION

## Organization Context

- A middle-sized organization of **2,300 employees**

- IT service : **84 people**, mainly focused on the IT activities of the Walloon payment agency in Belgium

- 15 projects in progress

- **Five units organized by business roles** : Architecture, Quality insurance, Developers, Project managers, Analysis

## Study Methodology

- **QUALITATIVE: Semi-structured Interviews :**
  - 2h per. business role unit
  - 2h project retrospective

- **QUANTITATIVE: 2 Questionnaires**
  - 15 project teams
  - 1st Questionnaire : **Analyze the current process** in terms of agility degree : Team organization, Project management, Requirements analysis, Development practices
  - 2nd Questionnaire : **Identify the desired and/or applicable agile practices**
  - **64 participant**
  - **74 % participation rate**

*Source: Supported approach for agile methods adaptation: an adoption study, Ayed et al., 2014*

# PROBLEM STATEMENT:
## AGILE ADOPTION BARRIERS – IN-VIVO OBSERVATION

### Qualitative Analysis Summary

### 3-Level Agile adoption barriers



**ORGANIZATION LEVEL**
- Process Appraisal : Capitalization
- Readability assessment: budget, contract, time constraints

**PROJECT INTER TEAM LEVEL**
- Stakeholders involvement
- Inter-team communication
- Reluctance: non acceptance of culture change

**TEAM LEVEL**
- Misused or non adapted practices
- Process visibility: lack of indicators
- Process documentation

*Source: Supported approach for agile methods adaptation: an adoption study, Ayed et al., 2014*

# PROBLEM STATEMENT
## GUIDING APPROACHES – LITERATURE REVIEW

- No structured approaches:
  - based on experts implicit knowledge
  - Non repeatable, difficult to exploit

- Existing structured approaches:
  - just guidelines with repeatable steps
  - no automation

# RESEARCH DIRECTION

## Research Goal

- Investigate an approach for guiding Agile processes adoption and improvement
  - **structured:** repeatable steps
  - based on **objective decision-making** elements

## Research Questions

- **RQ1 :** How can we characterize an **Agile Context?** What **attributes** influence Agility?

- **RQ2 :** How can we engineer and/or configure **suitable** Agile processes based on **those attributes**?

- **RQ3 :** How can we **empower decision-making with context indicators?**

# AMQUICK APPROACH
## OVERVIEW

- **AM-QuICK Framework**

- **Proposed structured steps (based on QIP):**

  1. **Context analysis :** characterize the context through interviews, GQM-based diagnosis, risk assessment tools, etc.

  2. **Agile Process Configuration:** Selection of suitable practices, Composition

  3. **Enactment:** Enactment of the process, analysis of feedback to allow later adjustments

  4. **Capitalization :** Future incoming projects have to profit from the gained experience
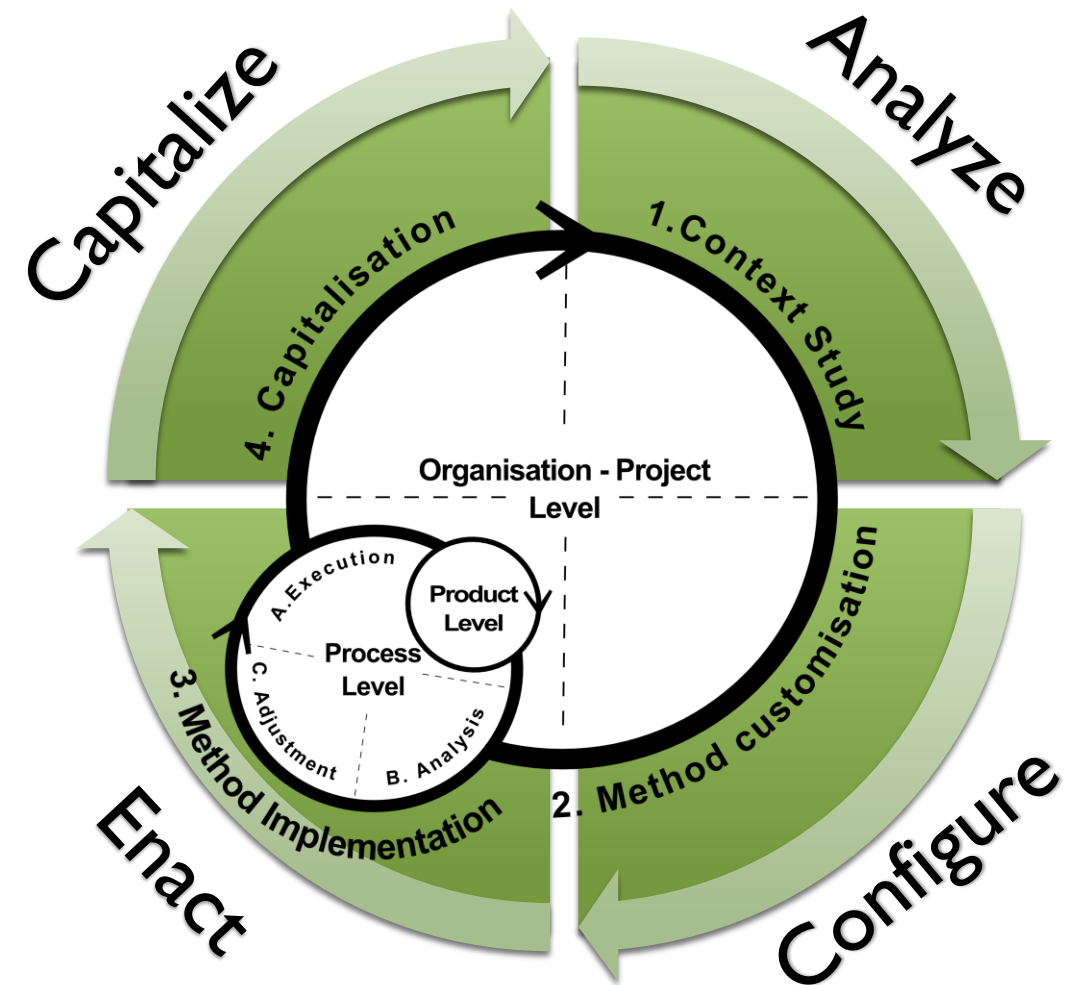
# AMQUICK APPROACH
## COMPONENTS

- **Process DSL:** design of process components and relationships

- **Context metamodel:** to describe different context profiles

- **Repository of reusable process components**

- **Rule-based engine (work in progress)**

  - **Knowledge database:** document process engineering rules(adaptation, extension, ..), tacit knowledge of experts and practitioners

  - **Inference engine**
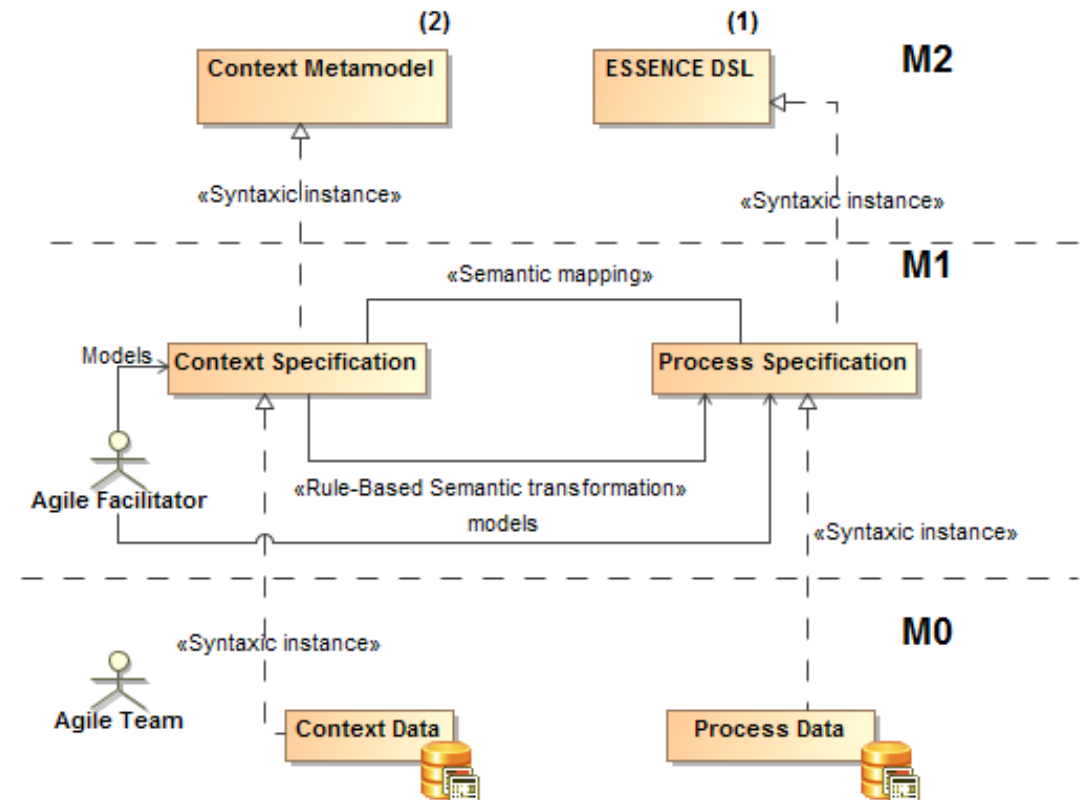
# AMQUICK APPROACH:
## PROCESS MODELING

- Simple DSL
- Graphical Notation
- Agile oriented
- Extensible
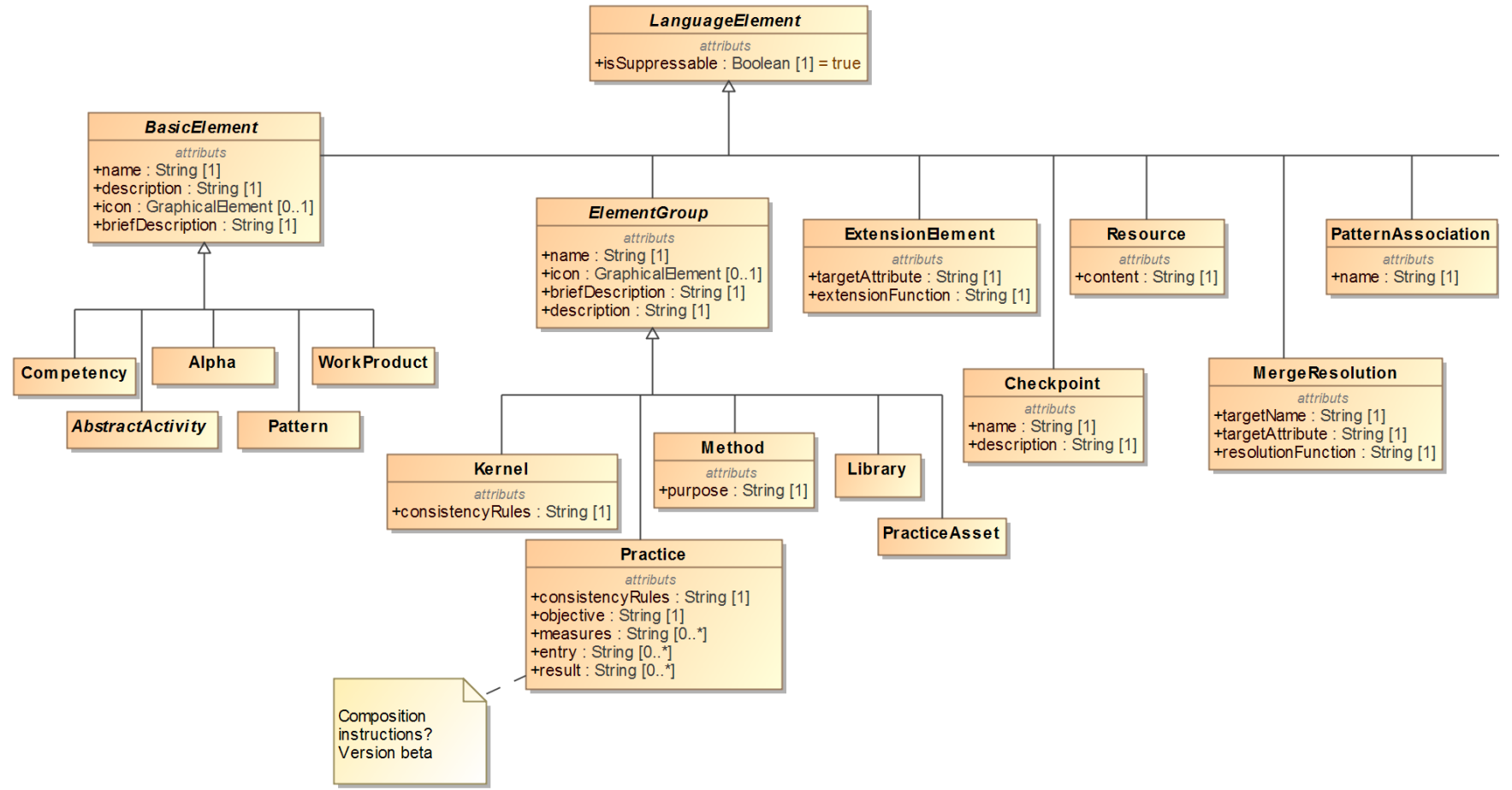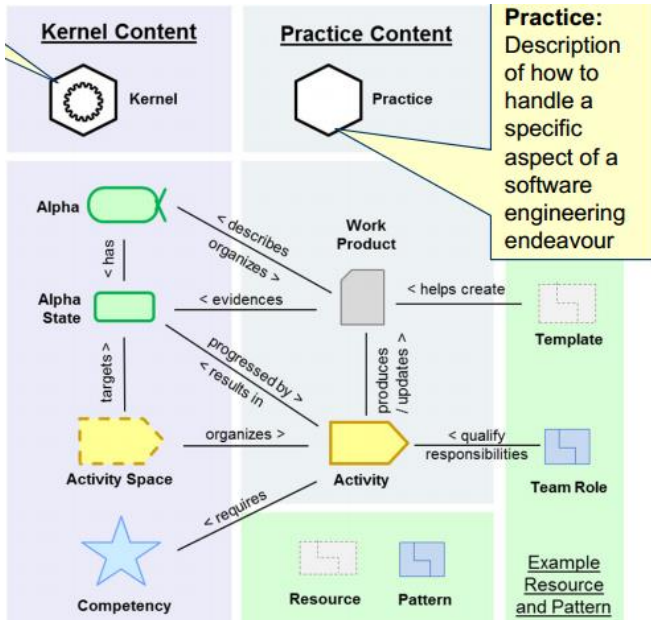
# AMQUICK APPROACH:
## CONTEXT MODELING

- Context taxonomy:
  - "Contextualizing Agile Software Development", Kruchten 2013
  - "Agile Scaling Factors", S. Ambler 2009
  - "A disciplined approach to adopting agile practices: the agile adoption framework", Sidky et al., 2012
  - "Balancing agility and discipline: A guide for the perplexed", Boehm et al., 2003

**Agile Context Attributes**
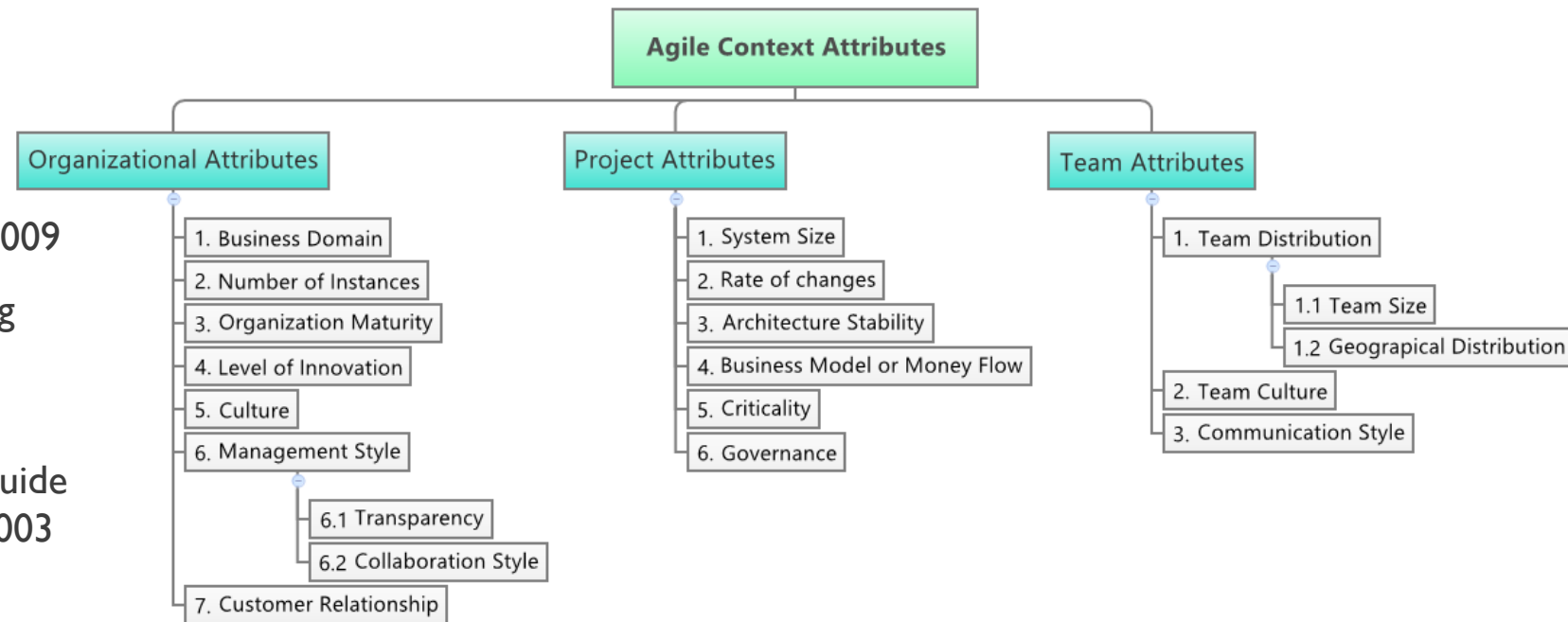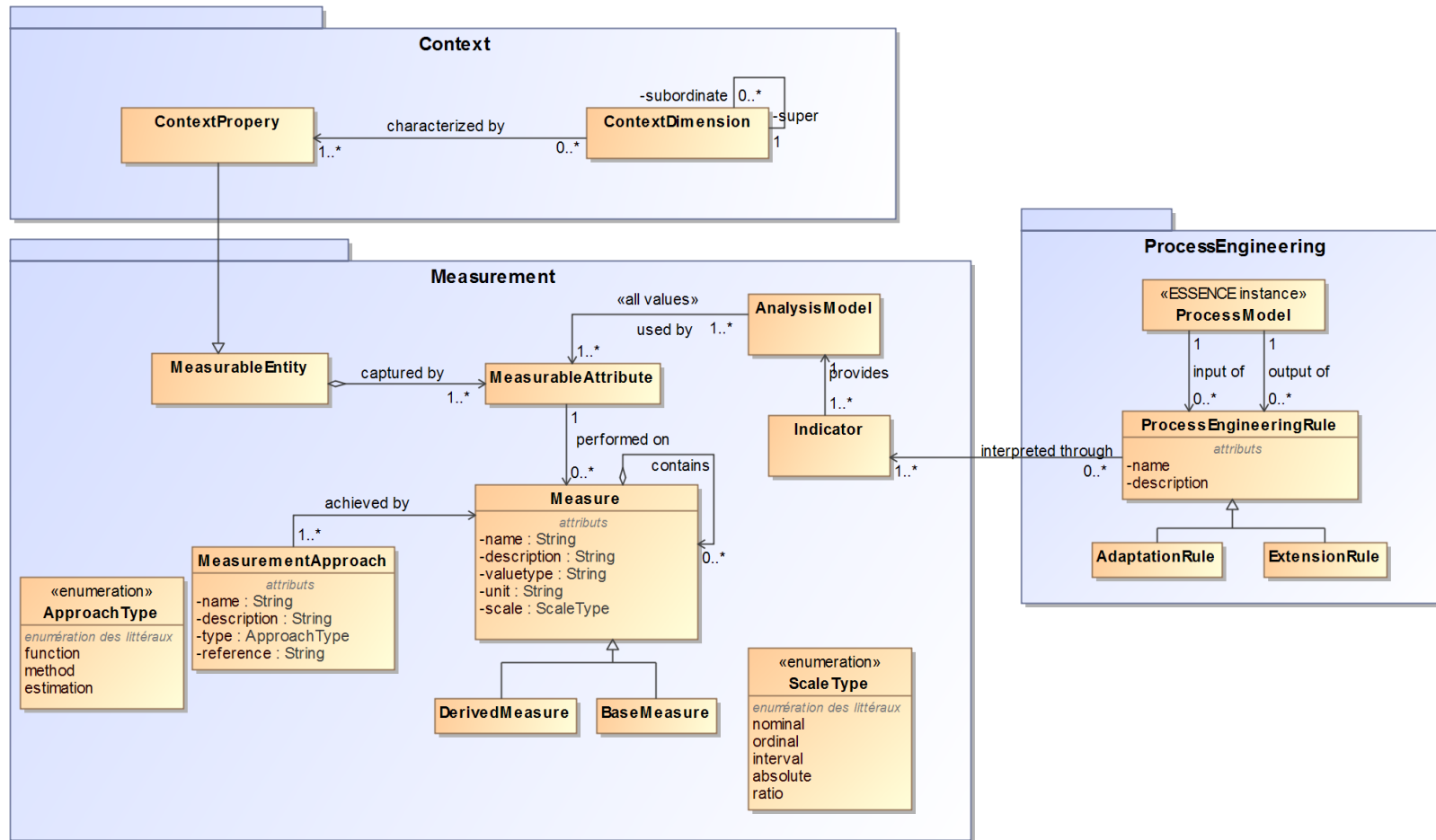
**Organizational Attributes**
- 1. Business Domain
- 2. Number of Instances
- 3. Organization Maturity
- 4. Level of Innovation
- 5. Culture
- 6. Management Style
  - 6.1 Transparency
  - 6.2 Collaboration Style
- 7. Customer Relationship

**Project Attributes**
- 1. System Size
- 2. Rate of changes
- 3. Architecture Stability
- 4. Business Model or Money Flow
- 5. Criticality
- 6. Governance

**Team Attributes**
- 1. Team Distribution
  - 1.1 Team Size
  - 1.2 Geographical Distribution
- 2. Team Culture
- 3. Communication Style

# AMQUICK APPROACH:
## CONTEXT MODELING

# AMQUICK APPROACH:
## CONTEXT MODELING: ILLUSTRATION
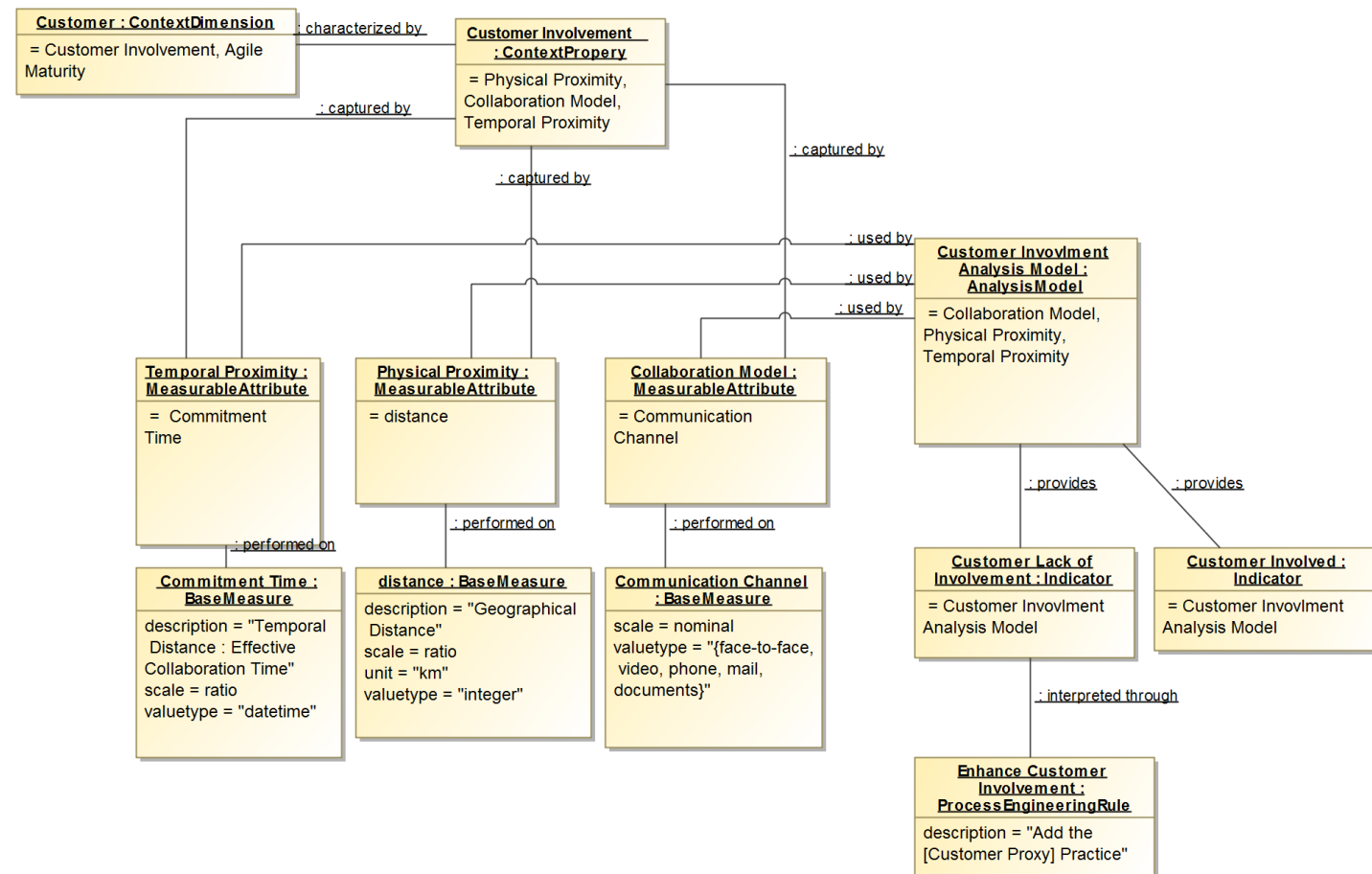
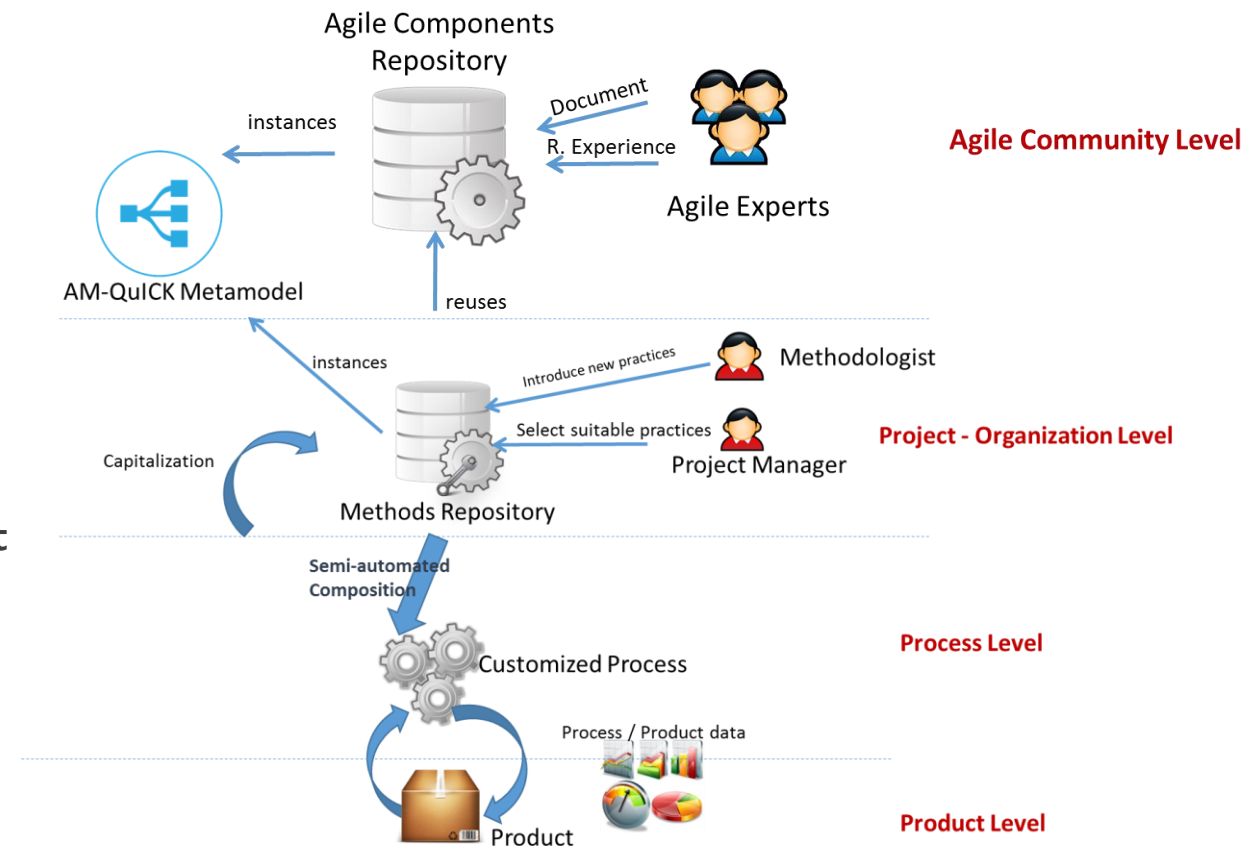# CONCLUSION AND FUTURE WORK

- Practices Independence :
  - No **BEST** practices but **MOST SUITABLE** practices
  - Practices are **CONTEXTUAL**
- The approach aims to support the **rapid and continuous decision making** to drive the process
- The approach is a way to:
  - **raise up the experts' knowledge**
  - learn from their **intuitive reasoning not to replace it**
  - Raise-up the **process visibility** to the organization level
  - Structure Agile Processes components / share with the community

# CONCLUSION AND FUTURE WORK

- Threats of validity

  - some practitioners reluctance: the approach is supported by managers, namely the projects portfolio manger. We still need a lot of communication

  - Assess whether the concerns being addressed by the research match those of practitioners and brings value: An evidence-based research is being conducted (a systematic literature review)

  - Still have to consider: practices for adoption of Agile methods at the organization level

- Future work :

  - Rule-based engine: Suggest decisions according to the evolution of the project data and context

# Thank you! Questions?

## CONTACT INFORMATION

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