

PMLite: an Open Source Solution for Process Monitoring

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Introduction

- Process monitoring a big challenge for organizations adopting multiple development paradigms
- Across-process enterprise-level measurement actions
 - Difficult to enact: data semantically different
 - Difficult to integrate

Our Work

- We propose a metamodel based methodology for enterprise-level across-process monitoring
- We present the open source tool PMLite (Process Monitoring Lite) as proof of concept of our approach

The Problem

- The adoption of multiple development processes has become common
- Different commercial agreements lead to the adoption of different development paradigms
 - e.g. Agile process for simple enterprise application and standardized waterfall process for Public Agency products
- Difficult to calculate organization processes performances

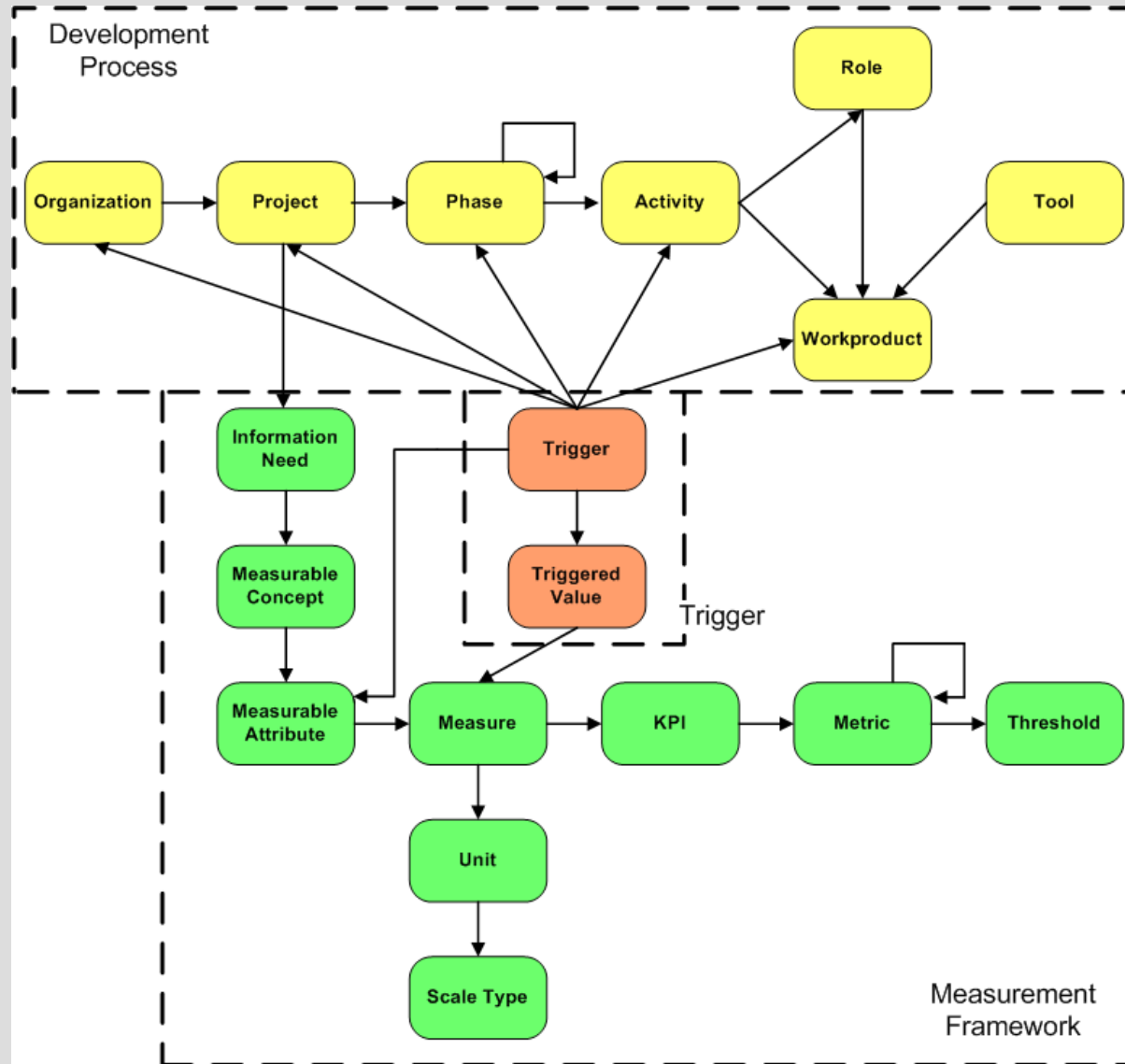
The Vision

- Give to managers and analyzers a global view of organization performances
- Give to project leaders freedom on development process choice
- Supply reliable enterprise level measurement frameworks

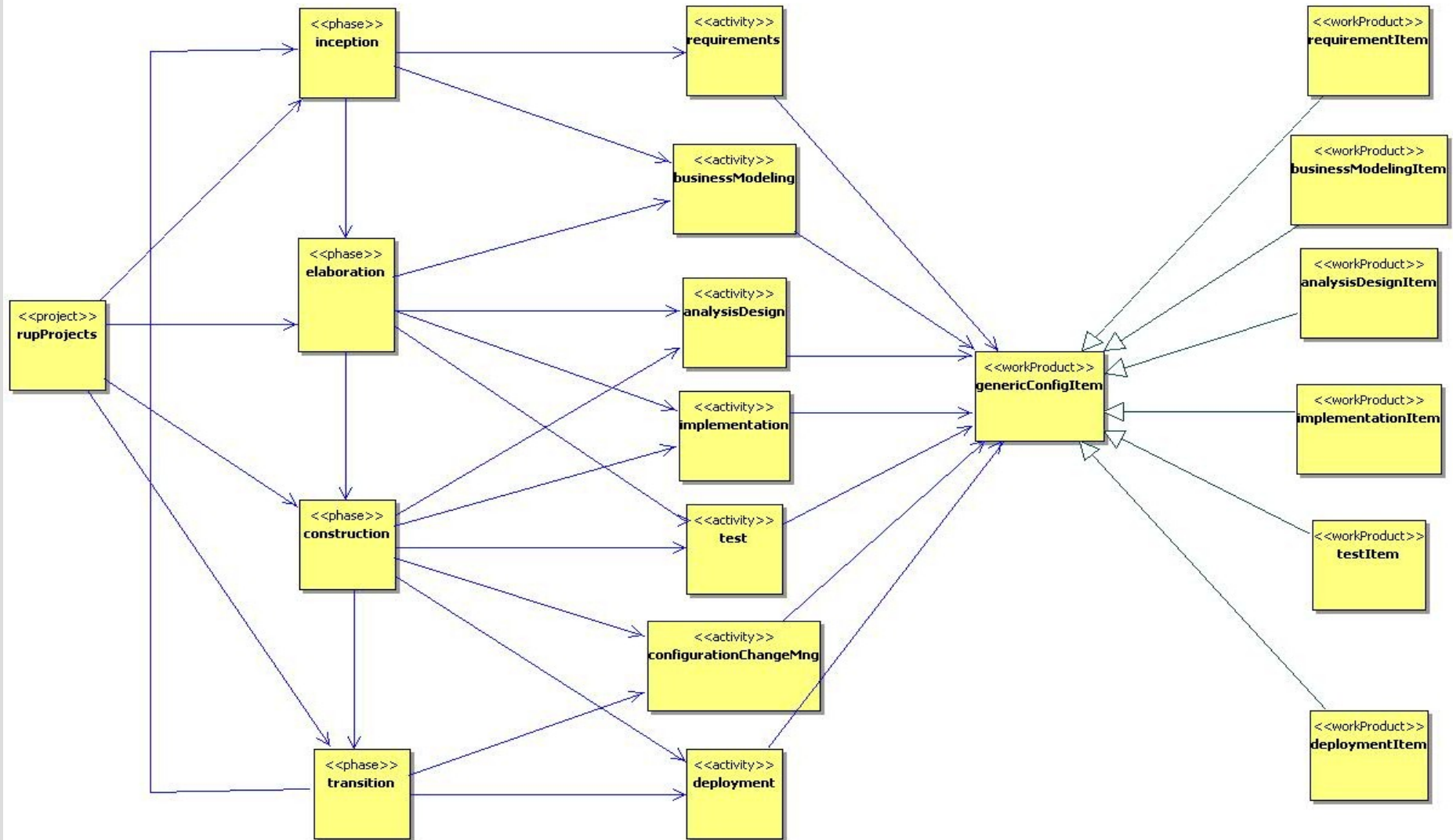
Our “meta” Solution

- We define a MOF-based metamodel generally describing
 - The development process
 - The measurement framework
 - The trigger layer
- Based on SPEM metamodel structure
 - We consider only the elements that are fundamental for our measurement actions

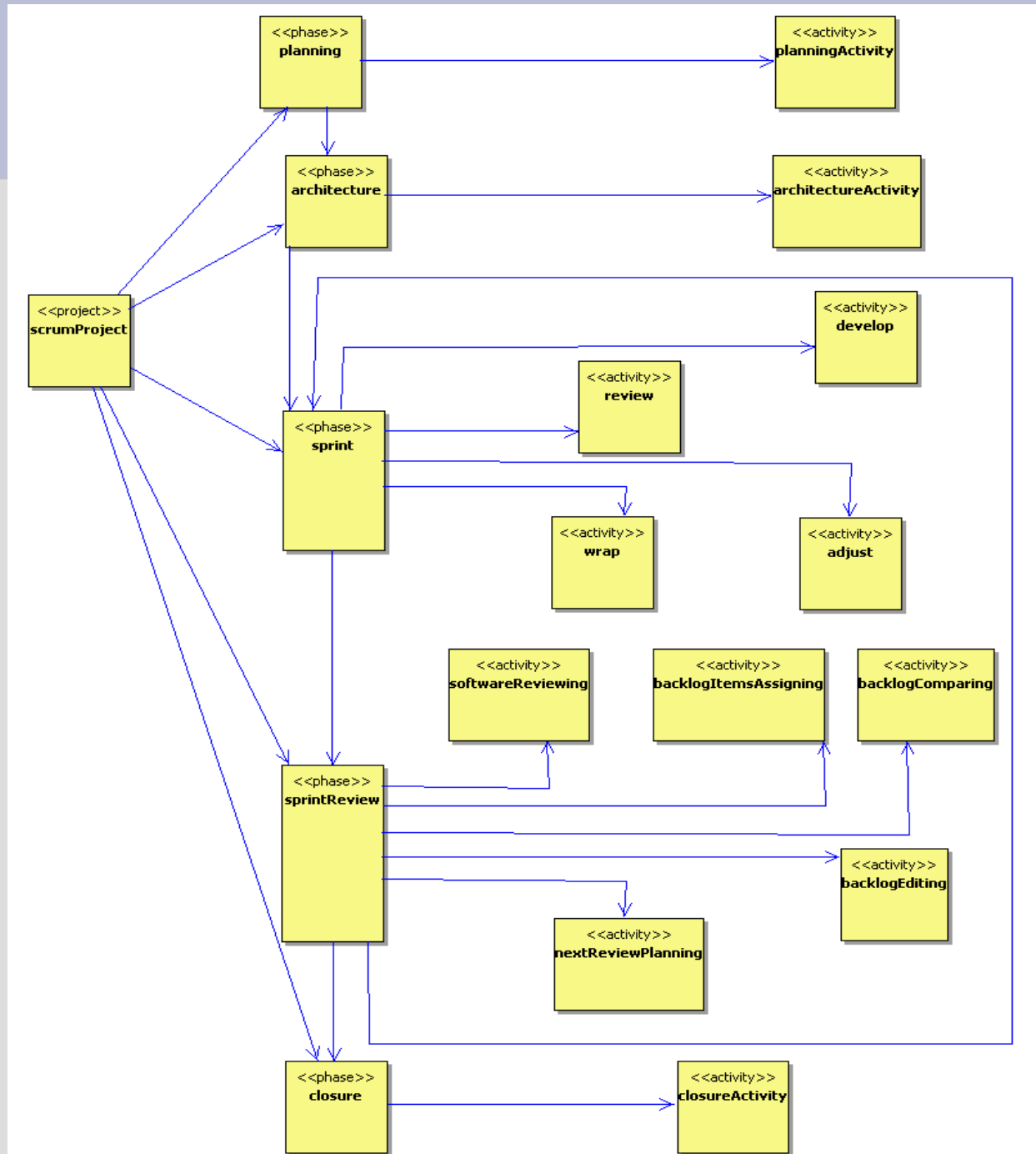
The Metamodel



A Metamodel Instance: RUP



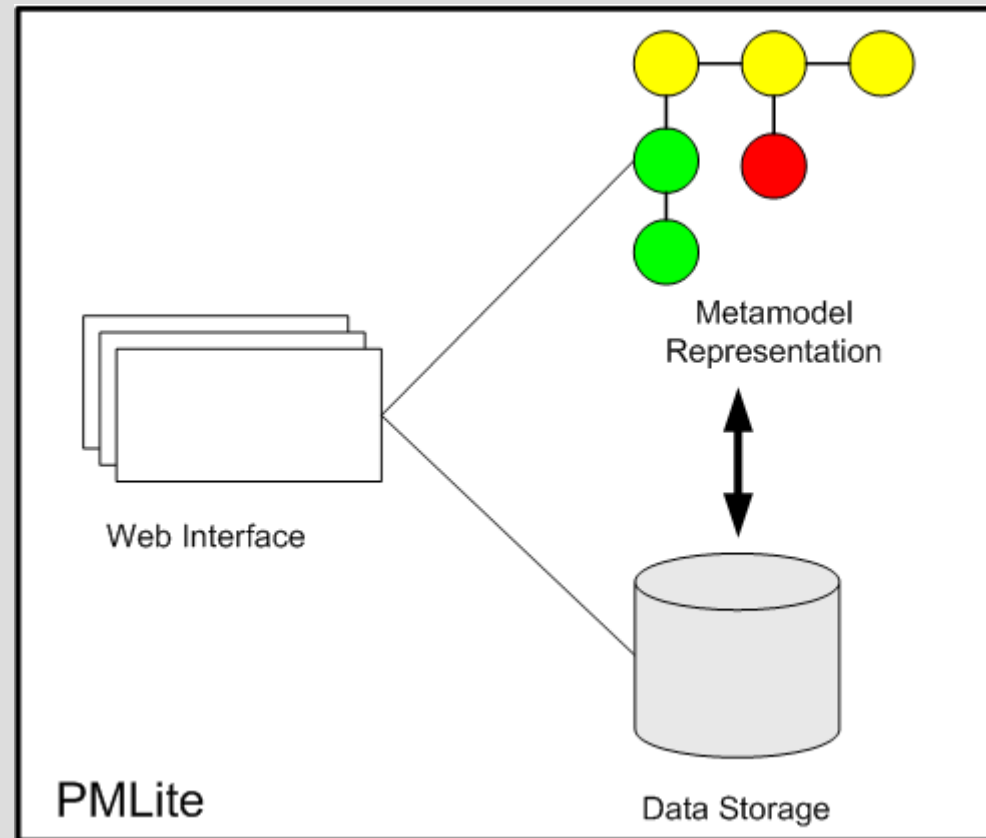
A Metamodel Instance: Scrum



From the Metamodel to PMLite: Requirements

- Develop a web-based application that fully adopts the metamodel
 - Follow the user in the measurement framework creation
- Produce an easy-to-use tool with a gentle learning curve
 - Low installation effort
 - Data collection method based on surveys
- Represent the first step for the formalization of more complex monitoring applications
 - Exploiting the metamodel approach for generic process monitoring

PMLite Conceptual Structure



- Web pages and data storage are based on the metamodel structure

PM Lite Homepage



[New Process](#)

[New Project](#)

[New Attribute](#)

[New Question](#)

[View Questions](#)

[Question Set](#)

[Survey](#)

[View Survey](#)

[Dimension Set](#)

PM Lite Web based application for enterprise Process Development Monitoring that allows project managers controlling software development activity through the definition of a metrics-based assessment framework, such as CMMi or ISO 9000-2001.

Definition of the Process

- Processes are defined in terms of phases and activities
- Relations between phases and activities, and transitions between phases define the flow of the process



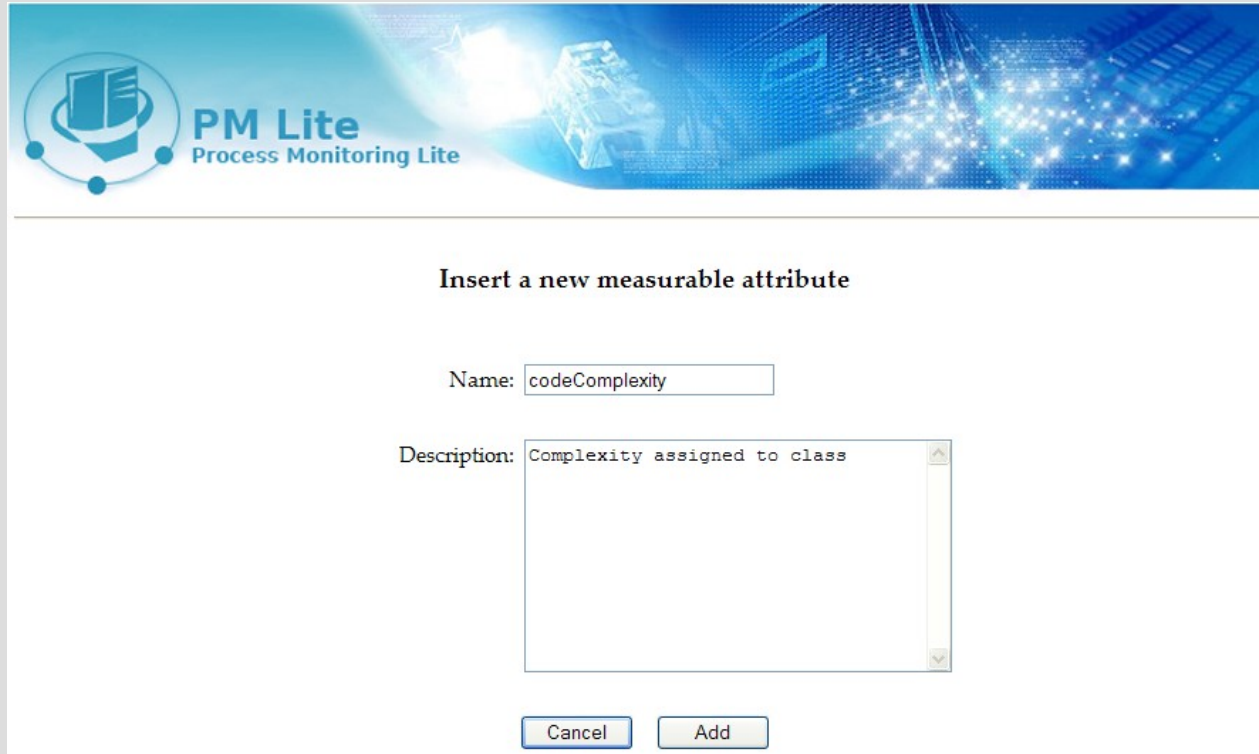
The screenshot displays the PM Lite Process Monitoring Lite interface. At the top, there is a header with the logo and text "PM Lite Process Monitoring Lite". Below the header, a dialog box asks: "Would You like to insert a new activity for process " Scrum " ?".

The dialog contains two input fields: "Name:" followed by a text box, and "Description:" followed by a larger text area. Below these fields are two buttons: "Cancel" and "Add".

Below the dialog, there is a table with two columns: "Name" and "Description". The table lists three activities: "Develop", "Wrap", and "Review". The "Wrap" activity is selected, indicated by a radio button. Below the table are two buttons: "Modify" and "Delete".

Name	Description
<input type="radio"/> Develop	Defining changes needed for the implementation of backlog requirements into packets, opening the packets, performing domain analysis, designing, developing, implementing, testing, and documenting the changes.
<input checked="" type="radio"/> Wrap	Closing the packets, creating an executable version of changes and how they implement backlog requirements.
<input type="radio"/> Review	Presenting work and review progress, raising and resolving issues and problems, adding new backlog items.

Definition of Measurable Attributes

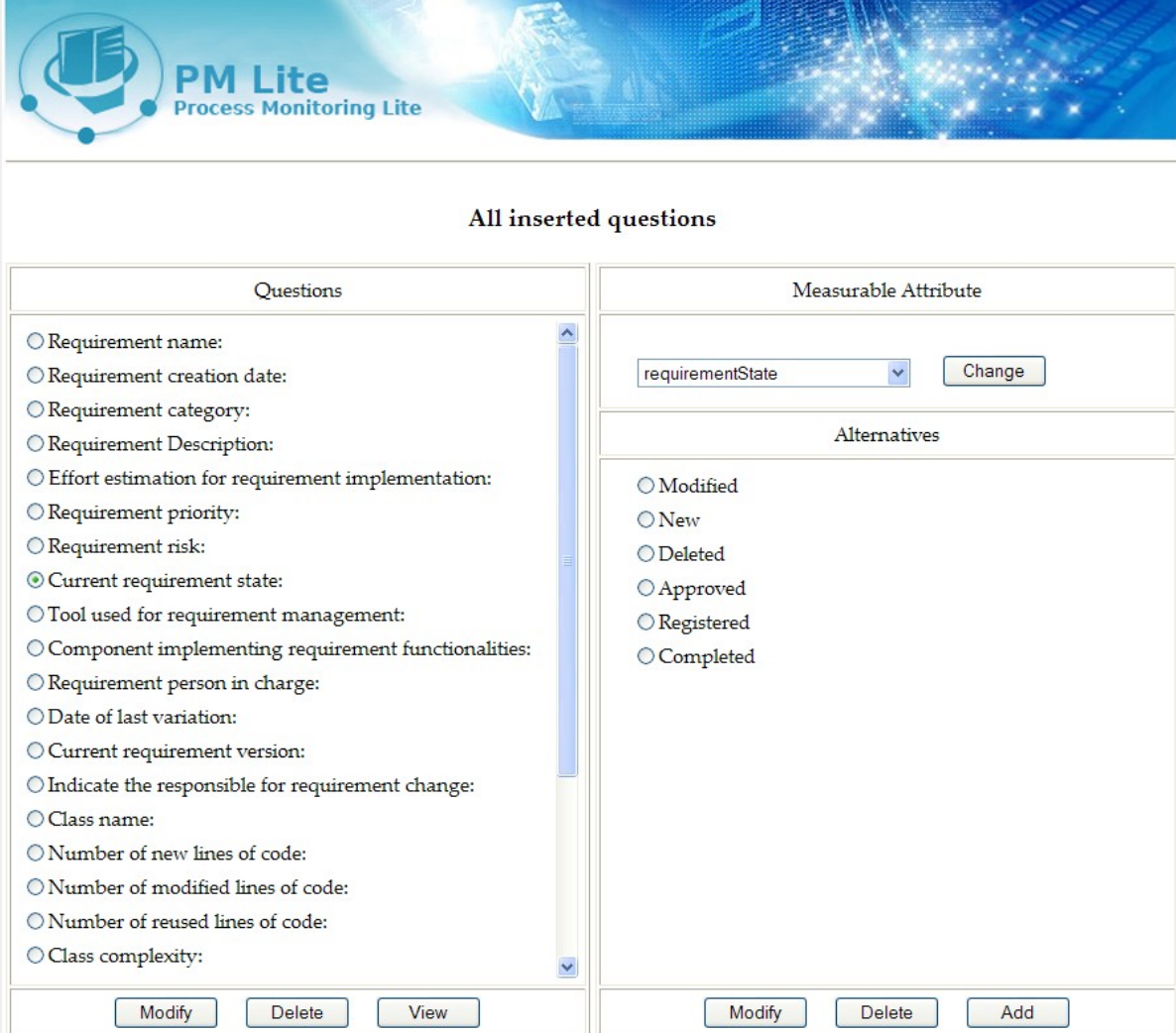


The screenshot shows the 'PM Lite Process Monitoring Lite' software interface. At the top, there is a header with a logo on the left and the text 'PM Lite Process Monitoring Lite' on the right. Below the header, the main window displays a dialog box titled 'Insert a new measurable attribute'. Inside the dialog, there are two input fields: 'Name:' with the value 'codeComplexity' and 'Description:' with the value 'Complexity assigned to class'. At the bottom of the dialog, there are two buttons: 'Cancel' and 'Add'.

- The definition of measurable attributes are critical for the definition of surveys and the overall measurement actions

Definition of Surveys

- Questions are directly connected to measurable attributes
- Questions are gathered in sets and linked to process elements



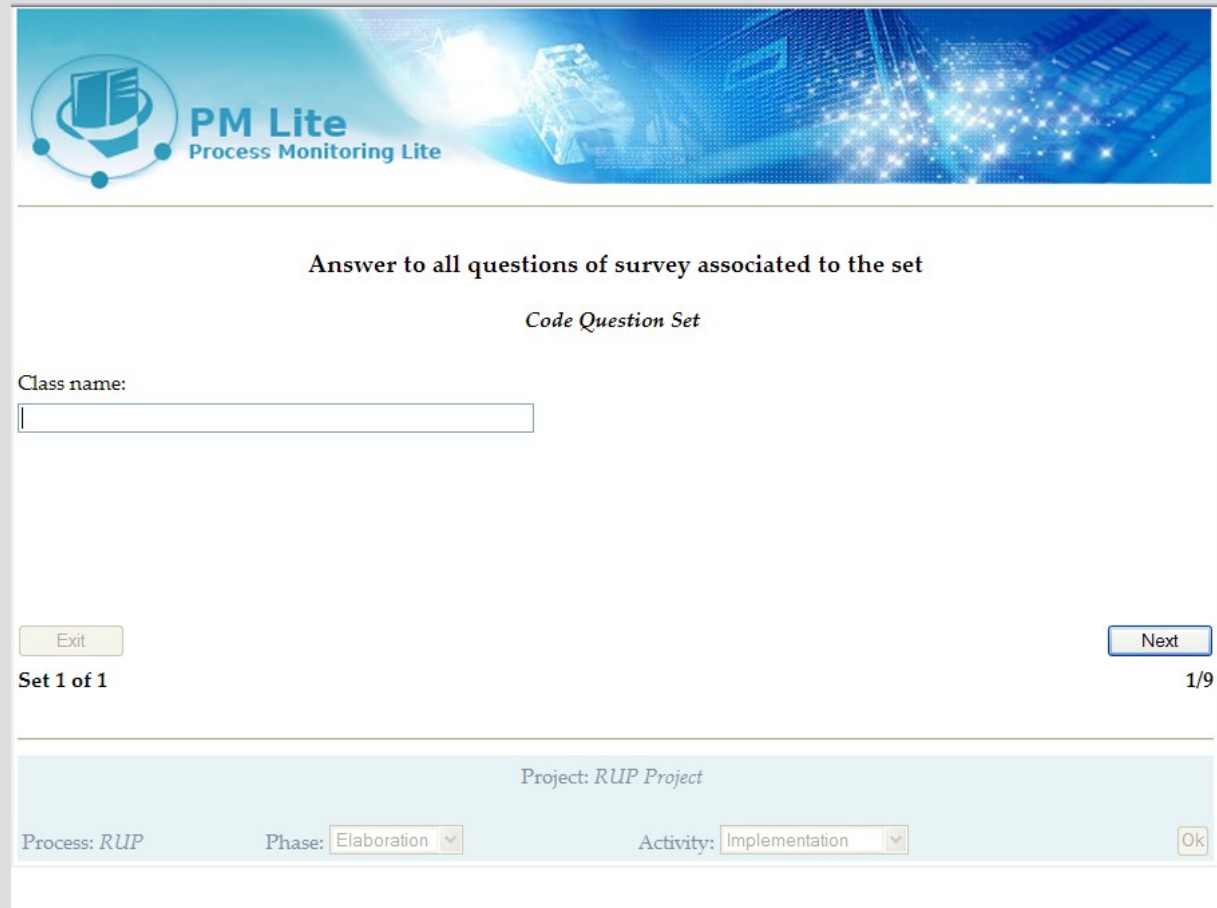
The screenshot displays the PM Lite Process Monitoring Lite interface. At the top, there is a header with the PM Lite logo and the text "PM Lite Process Monitoring Lite". Below the header, the main content area is titled "All inserted questions".

Questions	Measurable Attribute
<ul style="list-style-type: none"><input type="radio"/> Requirement name:<input type="radio"/> Requirement creation date:<input type="radio"/> Requirement category:<input type="radio"/> Requirement Description:<input type="radio"/> Effort estimation for requirement implementation:<input type="radio"/> Requirement priority:<input type="radio"/> Requirement risk:<input checked="" type="radio"/> Current requirement state:<input type="radio"/> Tool used for requirement management:<input type="radio"/> Component implementing requirement functionalities:<input type="radio"/> Requirement person in charge:<input type="radio"/> Date of last variation:<input type="radio"/> Current requirement version:<input type="radio"/> Indicate the responsible for requirement change:<input type="radio"/> Class name:<input type="radio"/> Number of new lines of code:<input type="radio"/> Number of modified lines of code:<input type="radio"/> Number of reused lines of code:<input type="radio"/> Class complexity:	<p>requirementState <input type="button" value="Change"/></p> <p>Alternatives</p> <ul style="list-style-type: none"><input type="radio"/> Modified<input type="radio"/> New<input type="radio"/> Deleted<input type="radio"/> Approved<input type="radio"/> Registered<input type="radio"/> Completed

At the bottom of the interface, there are two rows of buttons. The first row contains "Modify", "Delete", and "View" buttons. The second row contains "Modify", "Delete", and "Add" buttons.

Execution of the Surveys

- PMLite simulates automatic probes via the execution of surveys
- Questions sets are associated to specific process phase or activities



The screenshot displays the PM Lite Process Monitoring Lite interface. At the top, there is a blue header with the PM Lite logo and the text "PM Lite Process Monitoring Lite". Below the header, the main content area is white and contains the following elements:

- Instruction: "Answer to all questions of survey associated to the set"
- Section: "Code Question Set"
- Form field: "Class name:" with an empty text input box.
- Buttons: "Exit" (left) and "Next" (right).
- Status: "Set 1 of 1" (left) and "1/9" (right).

At the bottom, there is a light blue footer bar containing the following information:

- Project: RUP Project
- Process: RUP
- Phase: Elaboration (dropdown menu)
- Activity: Implementation (dropdown menu)
- Ok button (right)

Future Works

- Extend PMLite to develop a complete and automatic process monitoring environment
 - Fully transparent to developers
- The metamodel approach has been fully exploited in the designing of the structure of Spago4Q
- Exploit PMLite for the definition and proof-of-concept of specialized GQM
 - Theses activated on maturity frameworks and business process evaluation

Conclusions

- We presented our new Open Source tool, PMLite for enterprise-level process monitoring
- The proposed methodology could seem intrusive for developers but could be adapted for generic process monitoring

Thank You for the Attention

- Further information on
 - PMLite: *sourceforge.net/projects/pm-lite*
 - Spago4Q: *www.spago4q.org*