



GExpLine: A Tool for Supporting Experiment Composition

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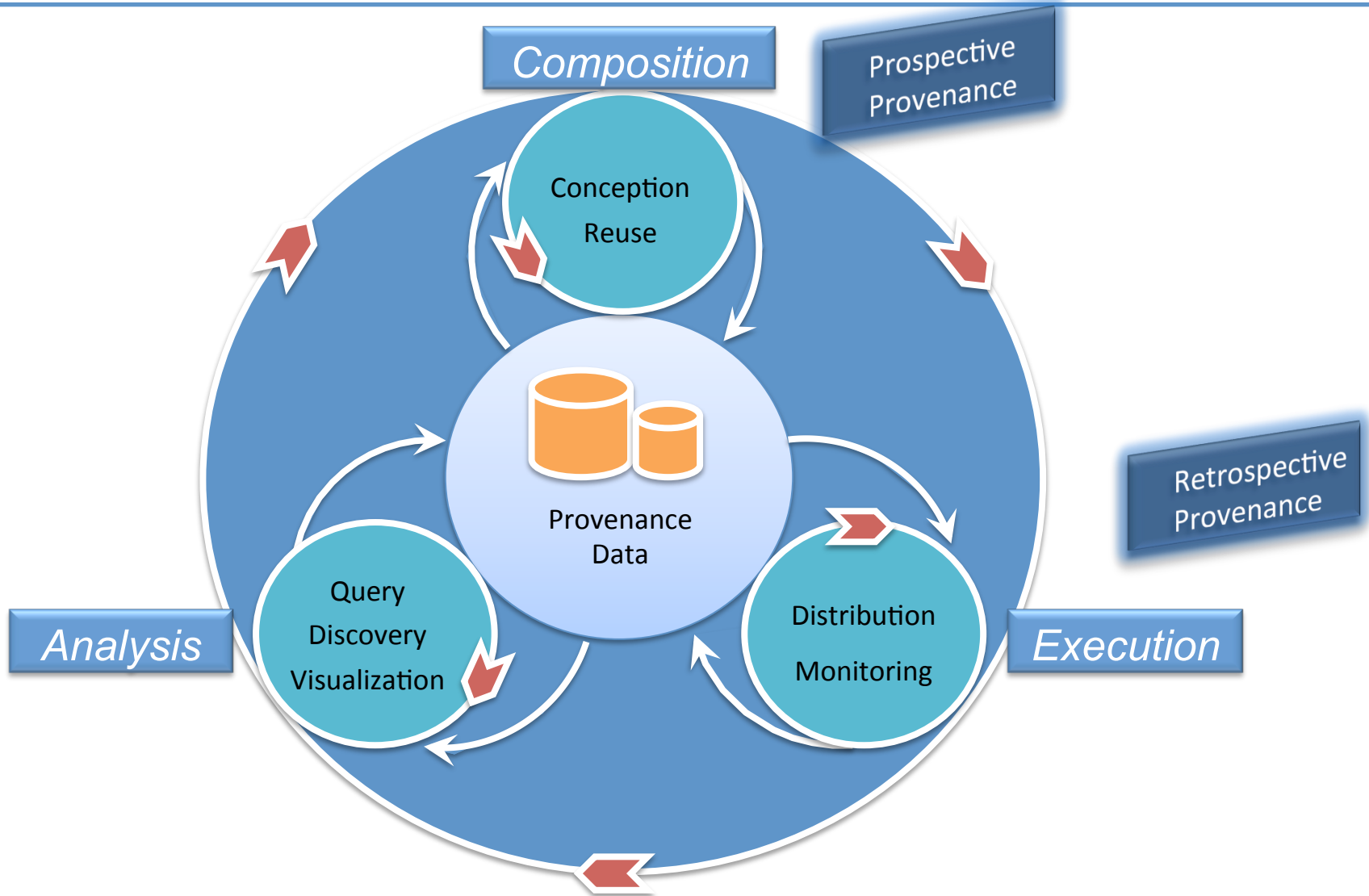
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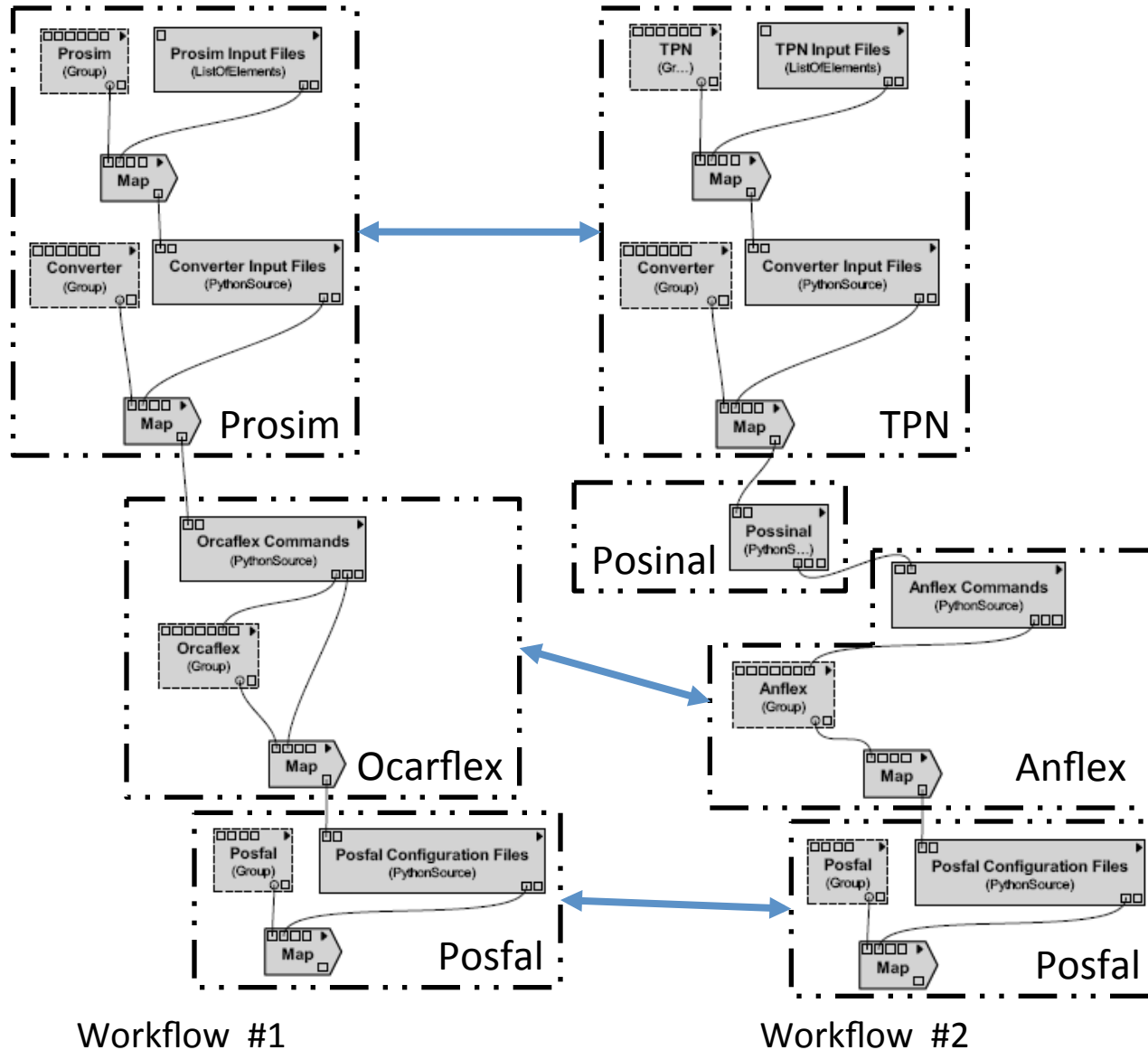


Experiment Life Cycle*

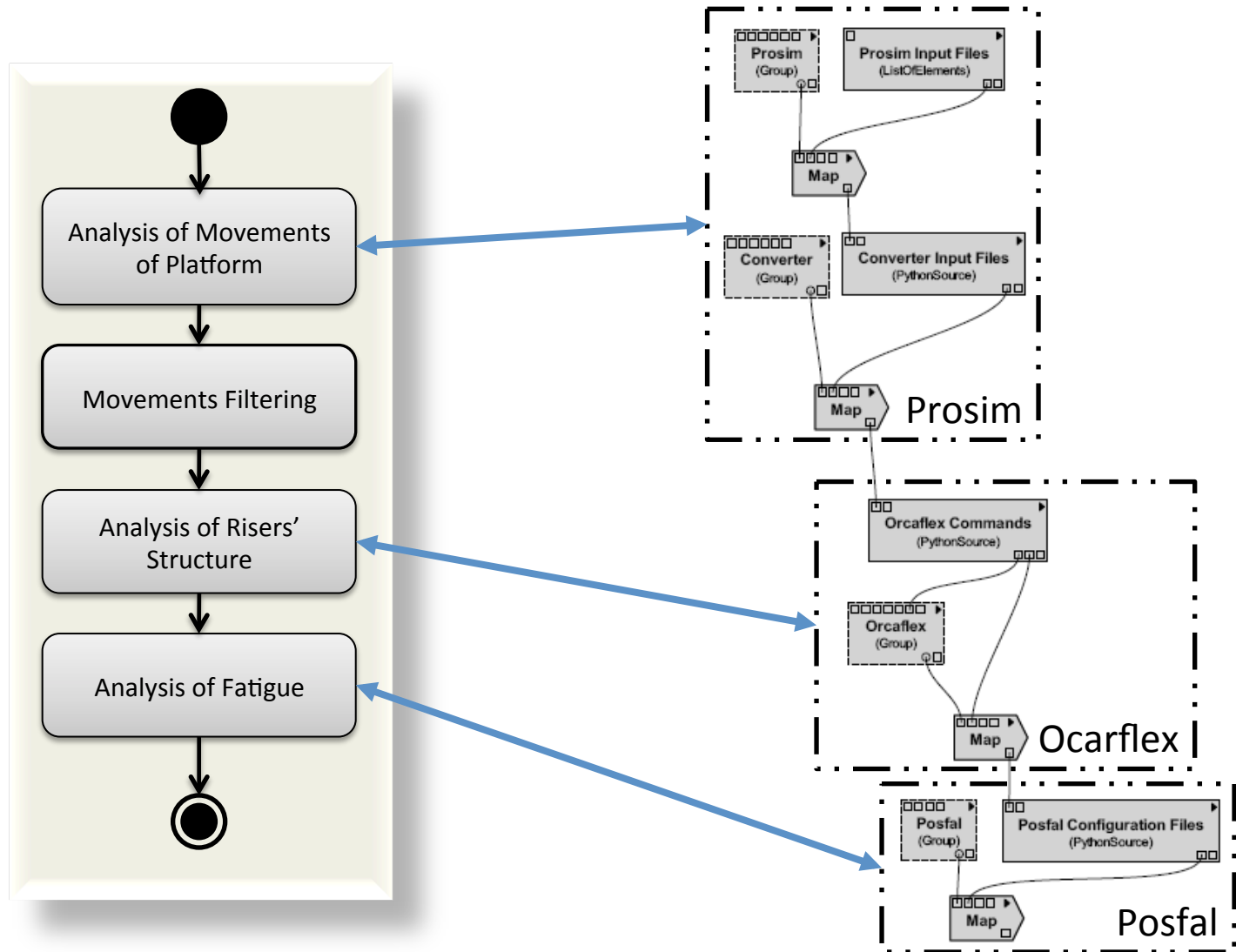


*Mattoso et al, 2010 - Towards Supporting the Life Cycle of Large Scale Scientific Experiments. IJBPIIM

Concrete Workflows for Deep Water Oil Exploration



Conceptual Workflows and Concrete Workflows Limitations





Scientists need support...

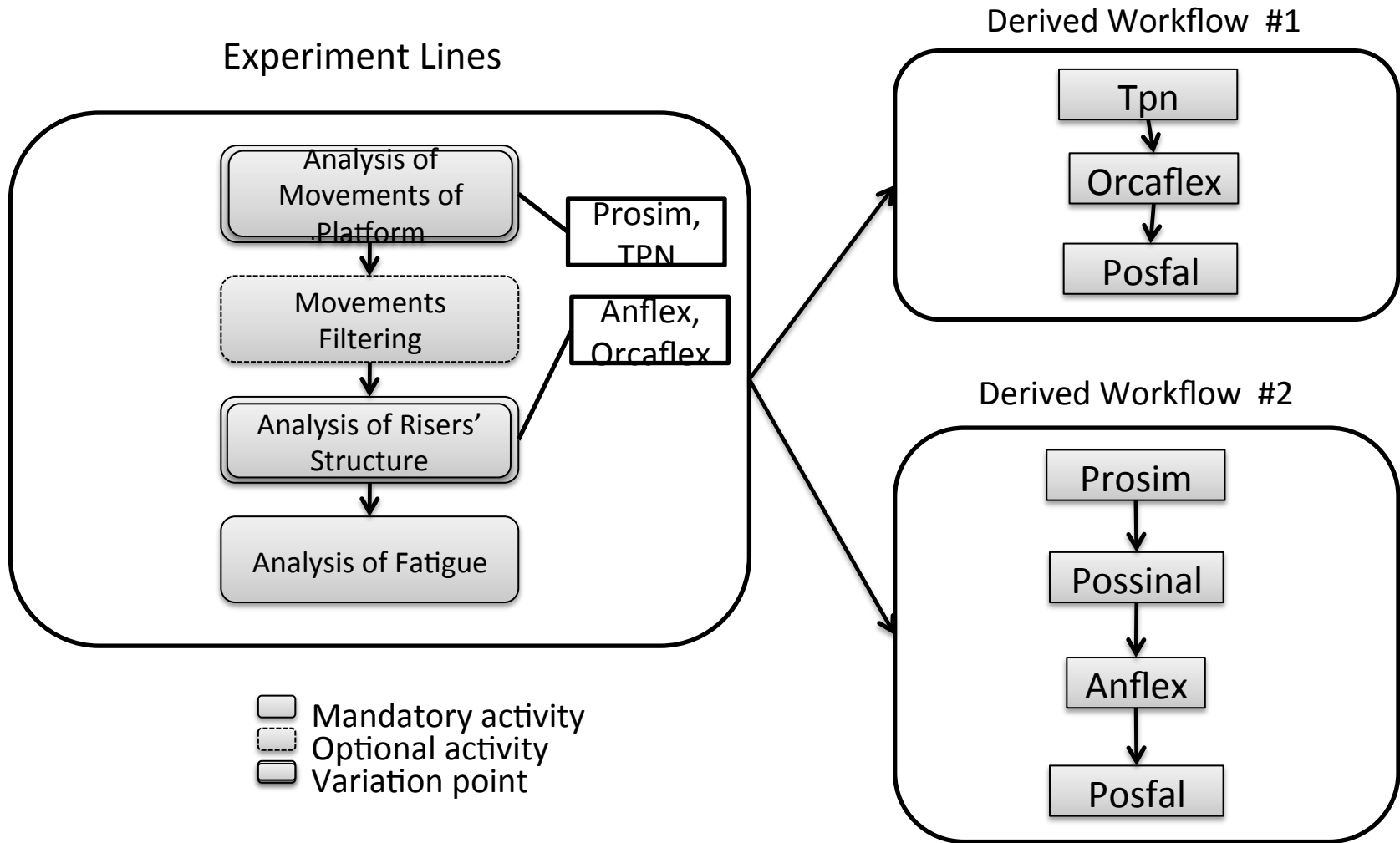
- For an independent representation that
 - Abstracts the workflow based on concepts
 - Presents alternatives for the experiment
 - Presents which activities may not be executed in experiment
- For capturing prospective provenance considering concepts of the scientific experiment by
 - Grouping different scientific workflows as part of a single experiment for future analysis



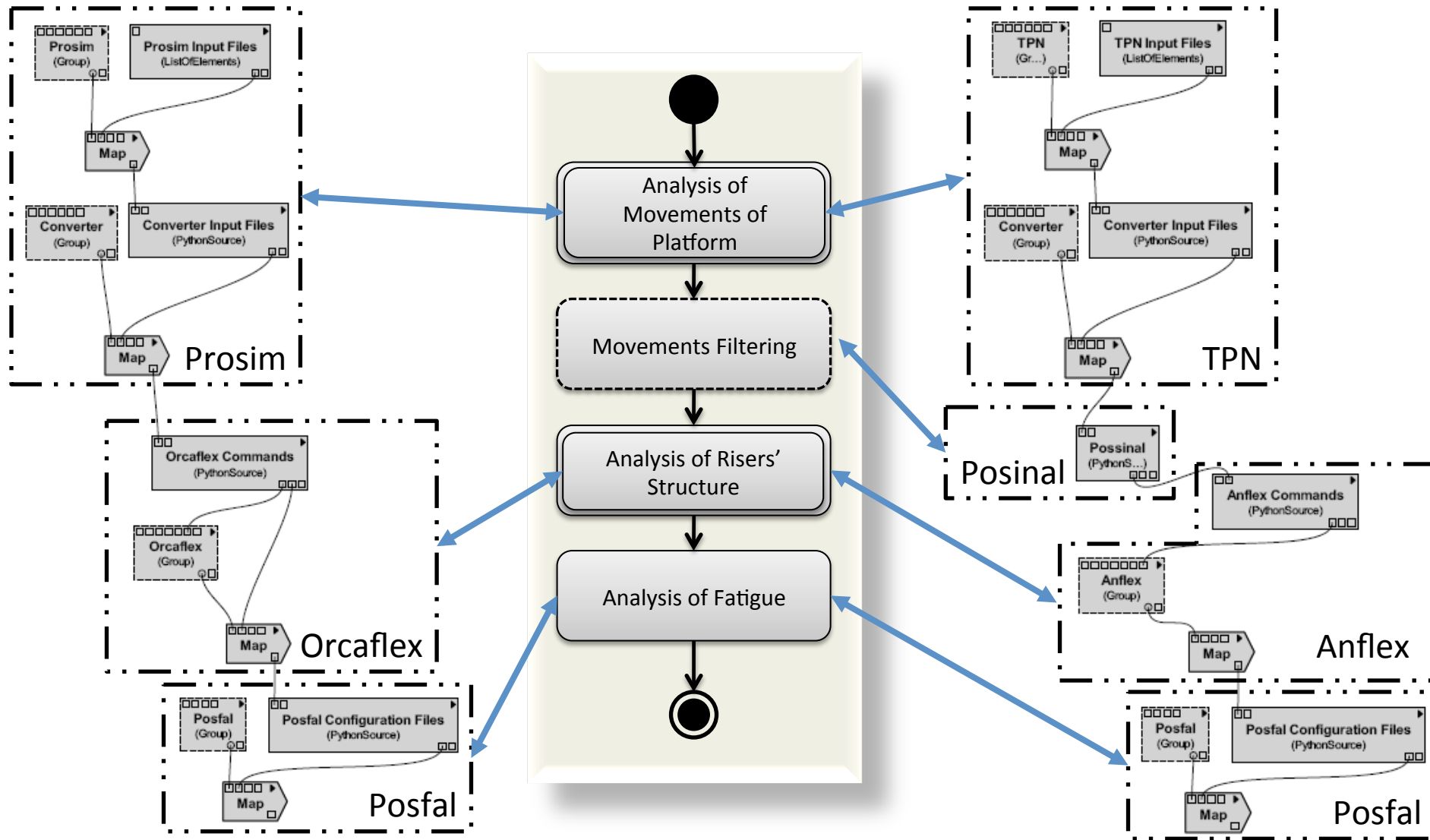
GExpLine Tool

- Focuses on the composition of conceptual workflows
- Enables prospective provenance registering for the experiment using Experiment Line approach

Experiment Lines



Experiment Lines





Characteristics of GExpLine

The screenshot shows the 'Experiment Line - Projeto de ancoragem do sistema offshore' window. The interface includes a menu bar (File, Edit, Help), a toolbar with icons for file operations and execution, and a main workspace. The workspace is divided into a 'Navigator' on the left and a 'Graph' area. The 'Graph' area displays a workflow diagram with four nodes: 'Analysis of Movements', 'Filtering of Movements', 'Analysis of risers structure', and 'Analysis of fatigue'. Arrows indicate the flow from 'Analysis of Movements' to 'Filtering of Movements', and from 'Filtering of Movements' to both 'Analysis of risers structure' and 'Analysis of fatigue'. A '2. Configuration Management features' callout box is positioned over the toolbar and graph area.

3. Workflow Importing

4. Workflow derivation

5. Prospective Provenance Querying Support



Derivation Process

Derive concrete workflows from a conceptual workflow

Derivation information is an important provenance data

It relates all concrete workflows (trials) for a single experiment (conceptual)

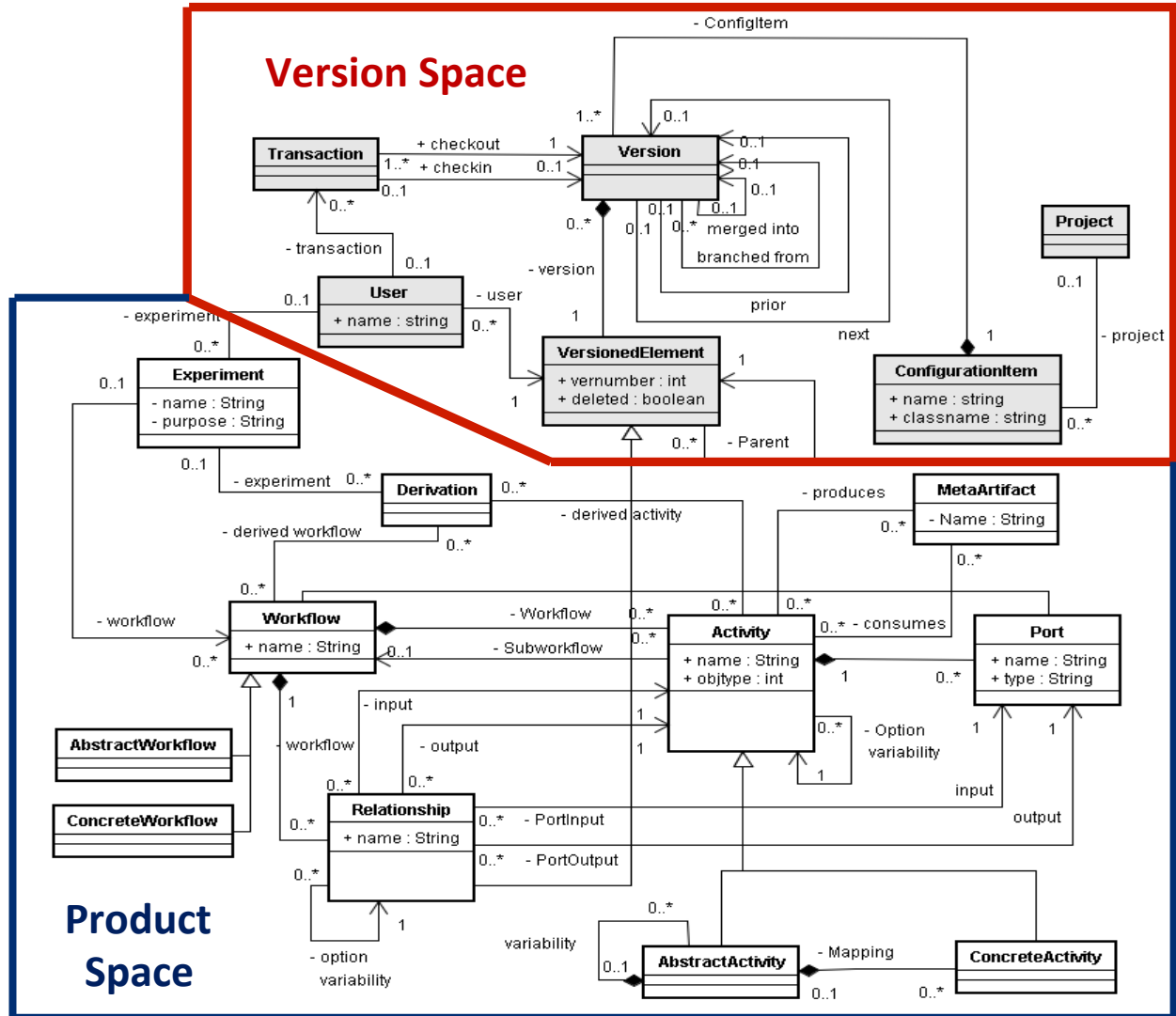




GExpLine Prospective Provenance Model

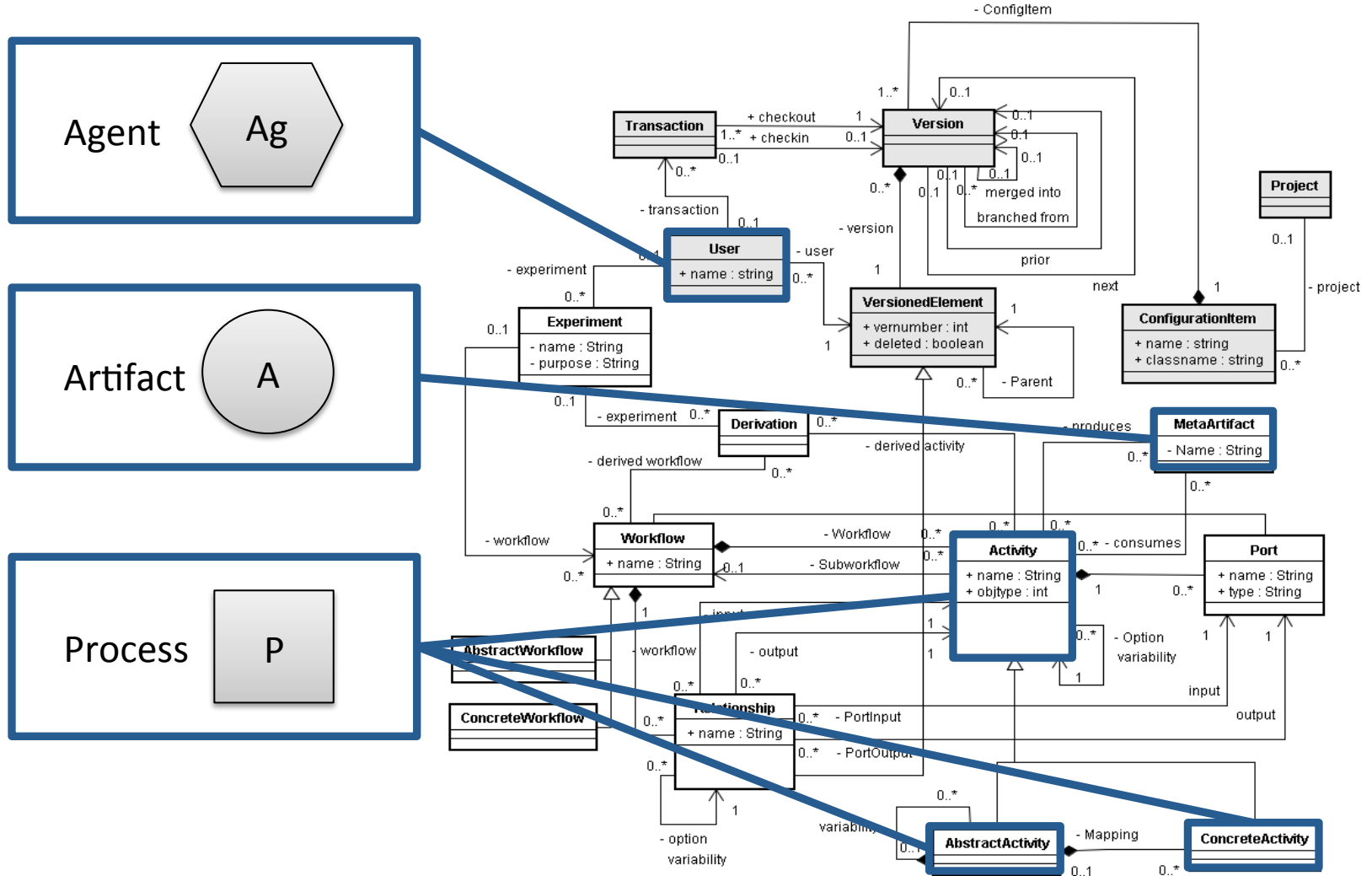
Allows for querying prospective provenance data

It is possible to relate the GExpLine workflow meta-model with the nodes of Open Provenance Model





GExpLine Prospective Provenance Model and OPM Mapping





Conclusions and Ongoing work

- GExpLine helps scientists to model their experiments using abstractions
- GExpLine improves the management of the scientific experiment
- GExpLine provides features to associate different concrete workflows to a single conceptual definition of the experiment
- Ongoing work
 - *We are currently working in joining conceptual prospective provenance data for the experiment with retrospective provenance data from SWfMS trials*



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Thank you!

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Pillars of composition in GExpLine

Provenance is orthogonal to those pillars and it is generated in each one of them

The composition should be strongly supported in scientific experiments

