

The OpenAltaRica Project

IMBSA 2014

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Develop an integrated platform, based on AltaRica 3.0, dedicated to safety analysis of complex systems

Model-based methodologies (MBSA)

- Declension of MBSE for safety analysis;
- Considers ‘high level’ formalisms (close to the functional and physical architecture of the system);

Idea

1. Design models in ‘high level’ formalisms
2. Calculate indicators
 - directly from the high level models
 - from low level models (typically a fault tree) obtained by compiling the formers

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Focus more and more attention

AltaRica 3.0

AltaRica: such a high level formalism dedicated to safety analysis

- 1st version : LaBRI (Bordeaux) end of 90's
 - ✓ Set-up the basic concepts;
 - ✓ Powerfull underlying mathematical model;
 - ✓ too resource consuming for industrial scale systems.

AltaRica 3.0

AltaRica: such a high level formalism dedicated to safety analysis

- 1st version : LaBRI (Bordeaux) end of 90's;
- 2nd version : AltaRica Data-Flow
 - Core language of several industrial (commercially distributed) Integrated Modeling and Simulation Environments:
 - ✓ Simfia (Apsys);
 - ✓ Safety Designer (Dassault Systèmes);
 - ✓ Cecilia OCAS (Dassault Aviation).
 - Several industrial successes
 - ✓ Last 10 years;
 - ✓ Use of AltaRica to perform safety analysis;
 - ✓ aeronautics, railway, naval, etc.

AltaRica 3.0

AltaRica: such a high level formalism dedicated to safety analysis

- 1st version : LaBRI (Bordeaux) end of 90's;
- 2nd version : AltaRica Data-Flow;
- 3rd version : AltaRica 3.0 (team A. Rauzy – LIX-ECP).

Improving AltaRica Data-Flow [1-2]:

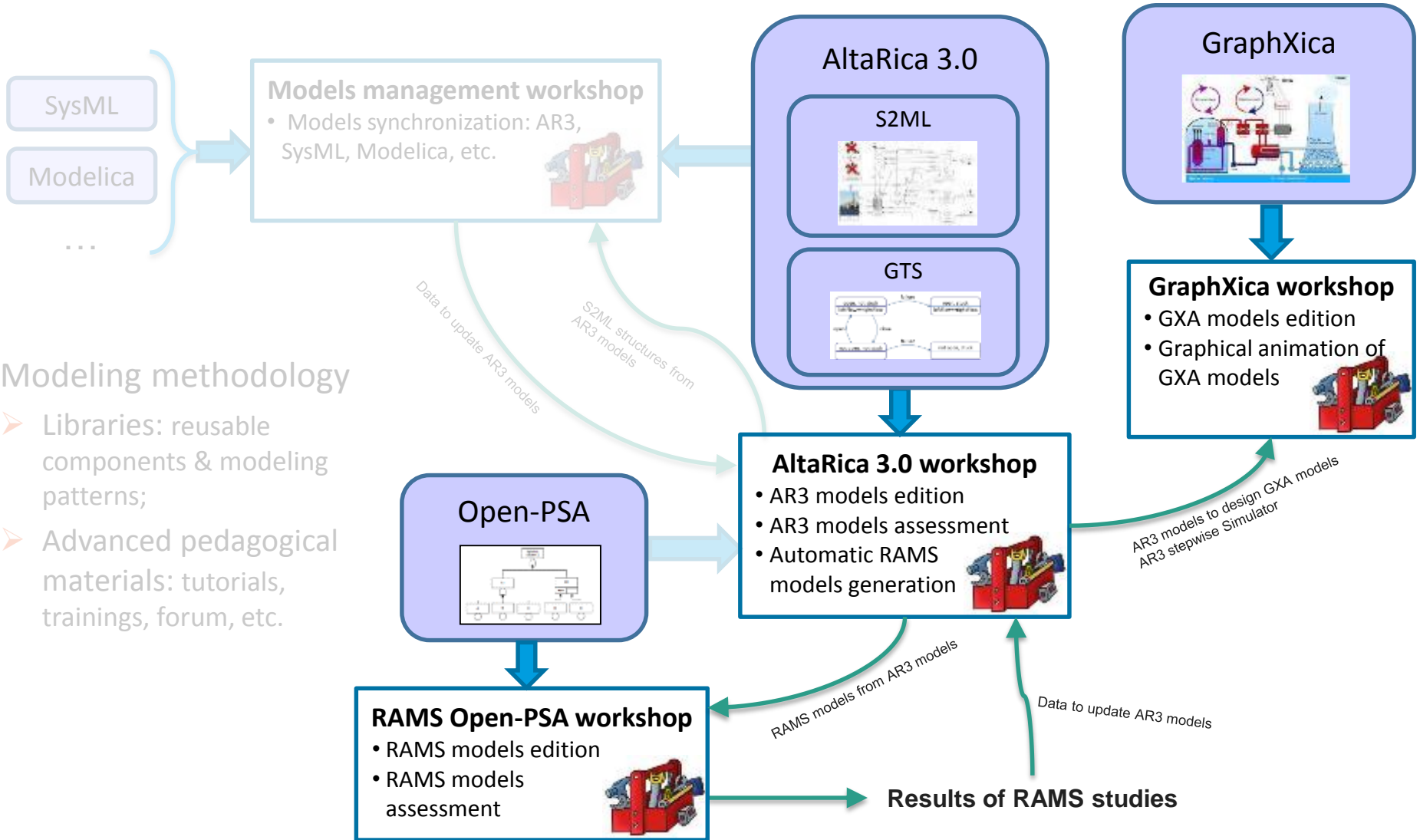
- new constructs to structure models: prototype based language
- new underlying mathematical model: Guarded Transitions Systems
 - ✓ handle systems with instant loops
 - ✓ define acausal components
- new syntax: close to Modelica.

[1] 'Safety Assessment of an electrical system with AltaRica 3.0', H. Mortada, T. Prosvirnova & A. Rauzy, IMBSA'14.

[2] 'The structural constructions of AltaRica 3.0', A. Rauzy & T. Prosvirnova, Lambda-Mu 19, october, 2014.

Develop *an integrated platform, based on AltaRica 3.0*,
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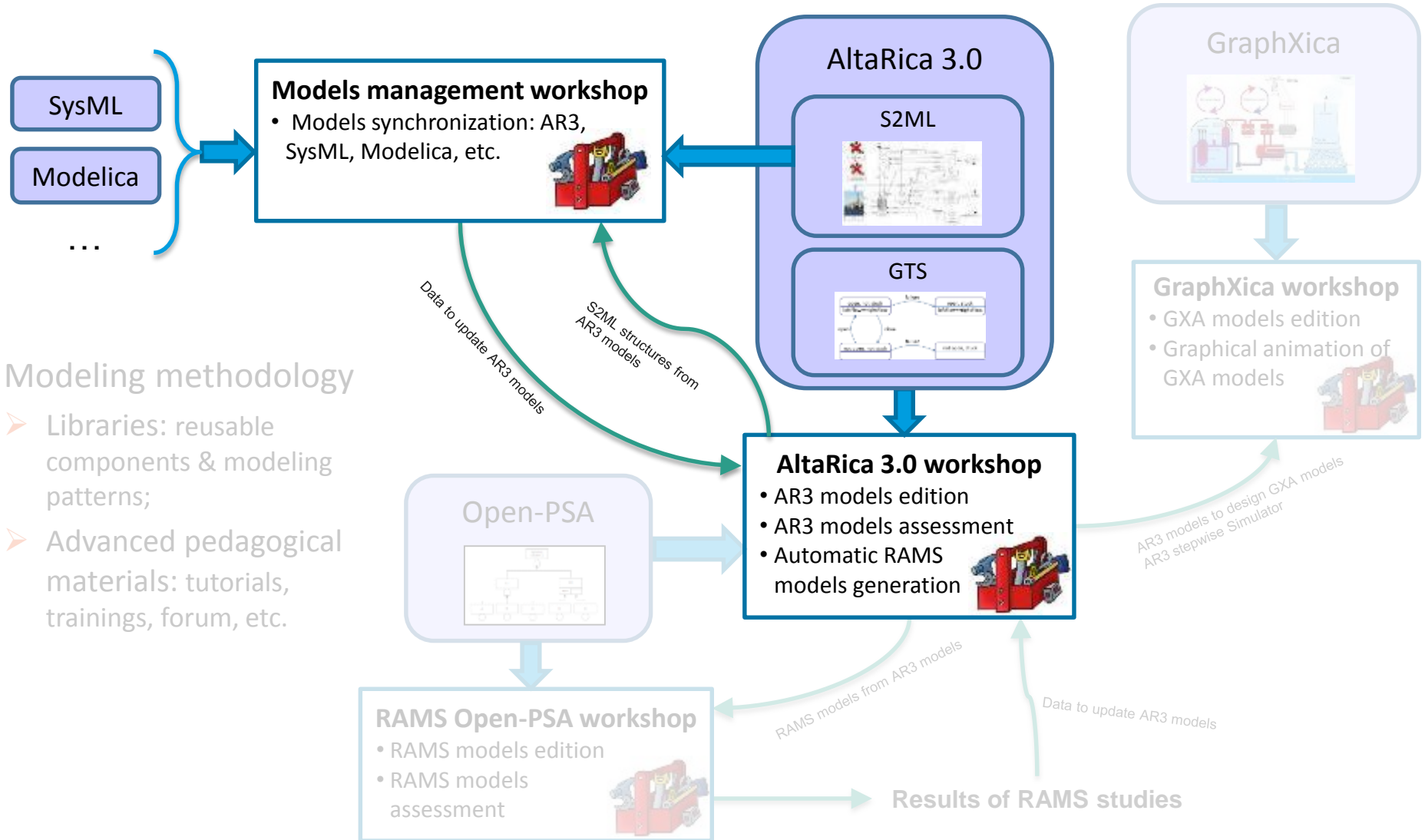
An integrated platform based on AltaRica 3.0



Modeling methodology

- Libraries: reusable components & modeling patterns;
- Advanced pedagogical materials: tutorials, trainings, forum, etc.

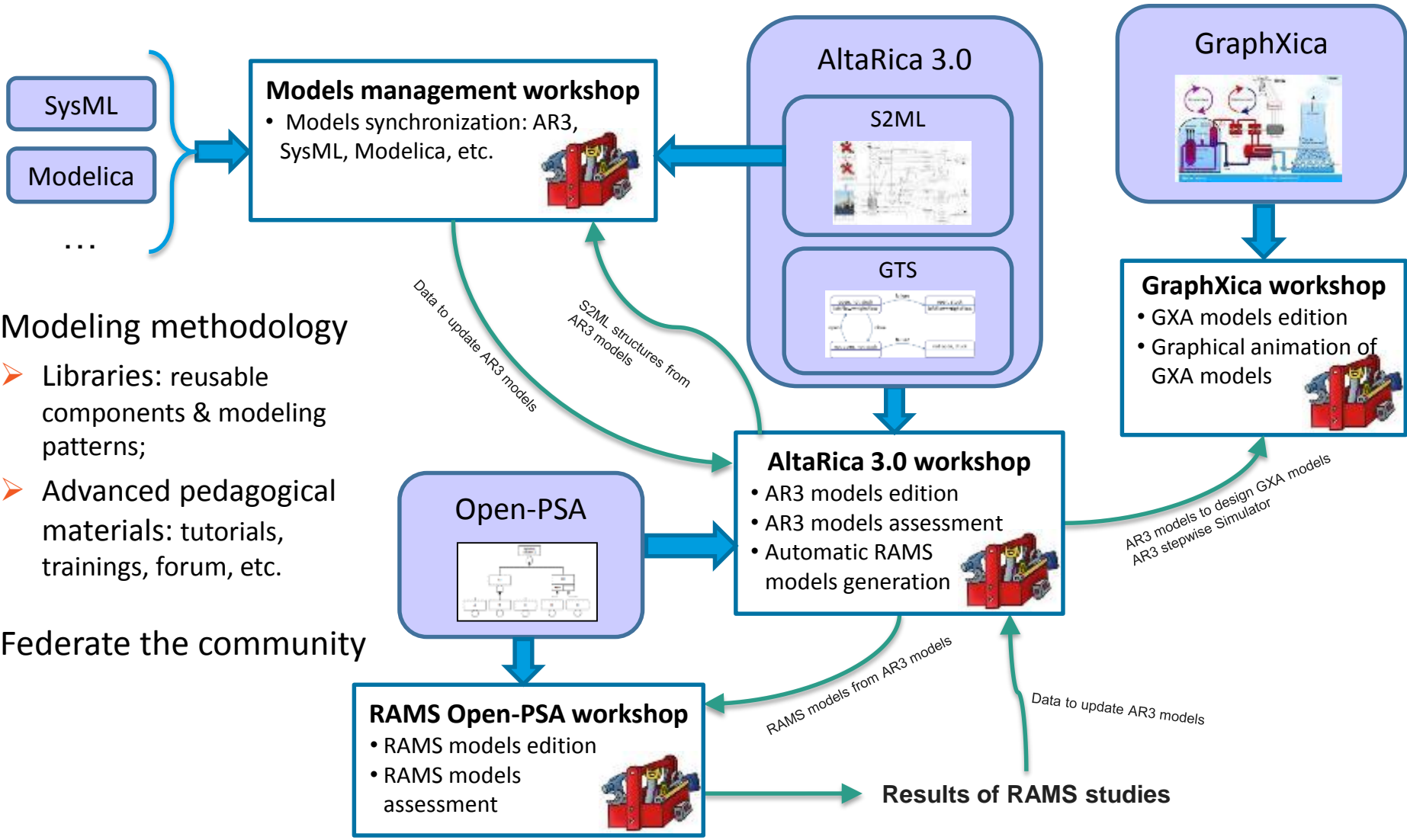
An integrated platform based on AltaRica 3.0



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An integrated platform based on AltaRica 3.0



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Federate the community

Develop an integrated platform, based on AltaRica 3.0,
dedicated to risk analysis of complex systems

The Project

Quantitative vision

- 5 years;
- IRT SystemX team: development of the platform;
- Scientific team (A. Rauzy): drive the scientific points;
- 3 partnership levels (with financial contributions for 2)
- Licence
 - 'community source' during the project
 - 'open source' at the end

CONTACTS

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