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Toolkit in OPen-source for Critical Applications & SystEms Development

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A limited market - Long life Products

_ **Uncertain suppliers durability**

_ **Subordination to the suppliers policy**

_ **Licences costs**

_ **Easy deployment and use peak management**

_ **Maintenance cost**

_ **Possible change to *specific maintenance***

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Open Source Solutions advantages

Sustainable investment : based on the users rather than on the market

Largely O.S. independent : multi-domain target, obsolescence management, a real strategy domain dependent

Adaptability : avoid to disturb our process due to tools, better change management

Perceptible licence and deployment costs reduction : load optimization, the cost is neither relative to the market nor to the added value of the product, but to the complexity of its implementation

Common maintenance

The Make benefits and the Buy advantages

Available Open Source Solutions

➢ **Concerning requirements and design phasis**

Some solutions exist, but they are uncomplete and it is not possible to use them in an industrial context.

    ✓ It is required to invest in some development.

    ✓ An efficient maintenance structure has to be defined.

➢ **Concerning the coding phasis**

Some mature solutions are available and are already used in industrial projects : GNAT(Ada), GCC (host environment), debuggers, Eclipse (EDI), Glade, perl, python, ...

    ✓ it is important to validate some other possibilities, especially about cross-compiling environments : GCC, GDB, ...

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Academic field Involvement

- An interesting field also for software engineering research activities :

  – several courses subjects identified

  – 9 thesis subjects proposed on :

    - Modelling and meta-modelling : ex. Semantic integration

    - Formal verification technics : synchronous ou asynchronous

    - Model management

    - Transformation technics

- The project development is hosted by ENSEEIHT

- Research Synergies between laboratories

- Link with Industrial needs : through integration of technologies in industrial process

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February 2004 : Airbus decision to go

Mars to June :
- Search of partners – CNRT-AE
- Conferences, 4 pages
- Study of similar projects

July to September :
- Links with similar projects

TopModL Initiative
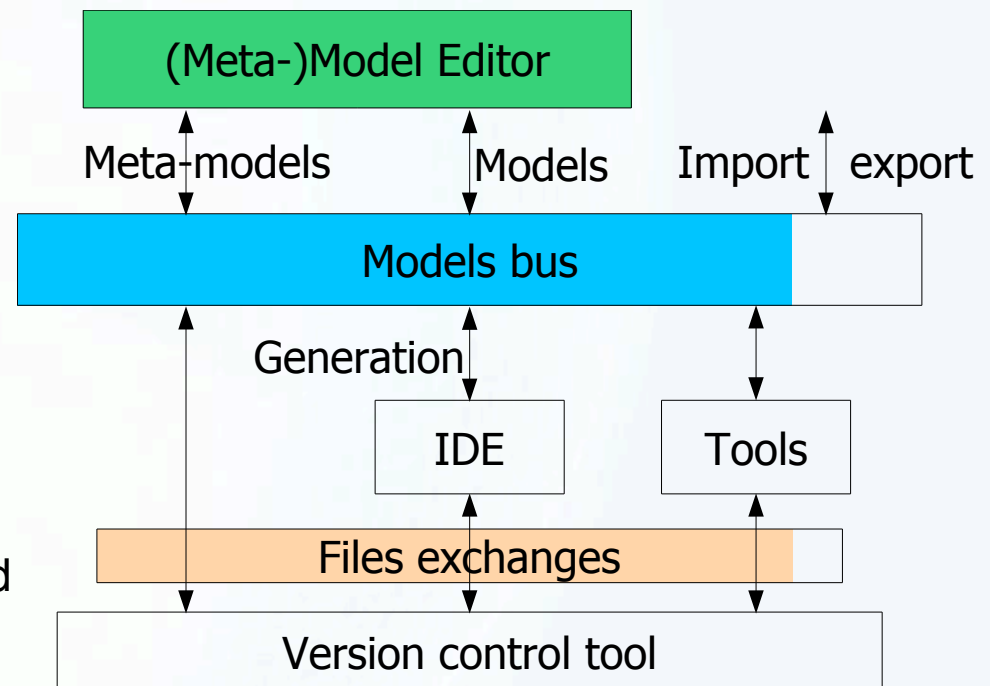
- More academic partners *ESEO*

- Define first works : Modelling tools

September : Launch of Modelling editor development (Airbus funding) End in June 2005

✓*A n-third architecture model centered.*

✓Adaptable tools (configuration, plugins, ...).

✓A smooth transition from existing environment (models, verification tools, tests plans, ...) to the new tools and formalisms (UML2, ...).

✓The development will be based on existing open source softwares.

✓The tools will be able to manage distributed team.

✓An open system (import/export plugins, data access API).

(Meta-)Model Editor

Meta-models   Models   Import | export

Models bus	

Generation

IDE	Tools

Files exchanges

Version control tool

Octobre – January 2005 :
Pôle de compétitivité Aéronautique, espace et systèmes embarqués
System/Equipment/Software/Hardware

Aims

• A process of integrated development of the specification system until the realization of the product by supporting an incremental approach

• The development of (meta-)modeling tools specific to the existing/future notations as well as the migration of the existing models towards this new tool.

• Use Formal technics to verify models : synchronous and asynchronous approach dedicated to specific properties

• A tool-set organized in the form of a federation of inter-operative tools, in order to be able to deploy only limited parts of this tool set according to the context and needs

• The business model of the products carried out which is one of the keys of success of the project

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Breakdown

• WP1 – Define overall process

• WP2 – Develop modeling tools

• WP3 – Define & integrate formal verification tool and simulation

• WP4 – Coding phase
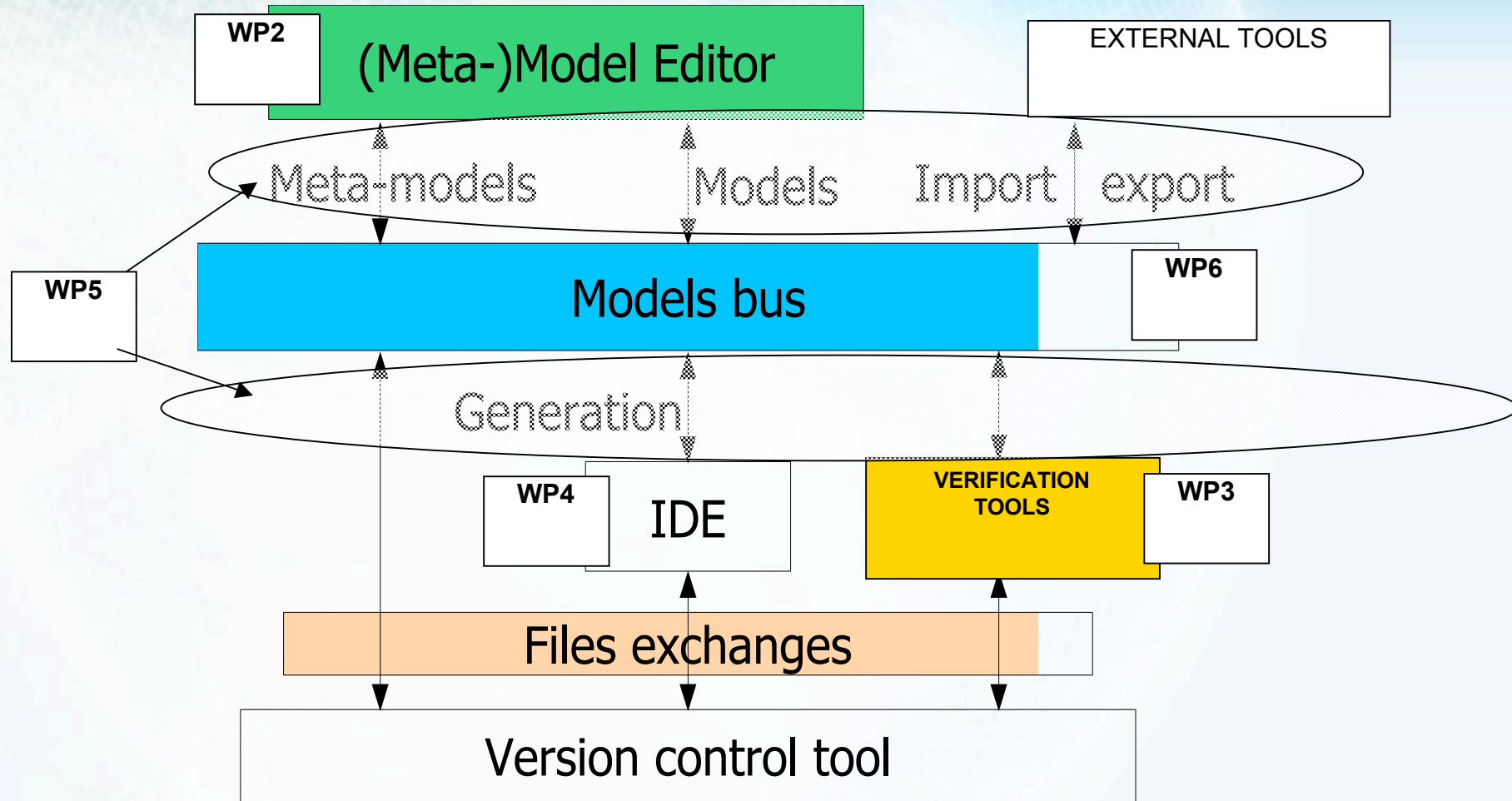
• WP5 – Transformations
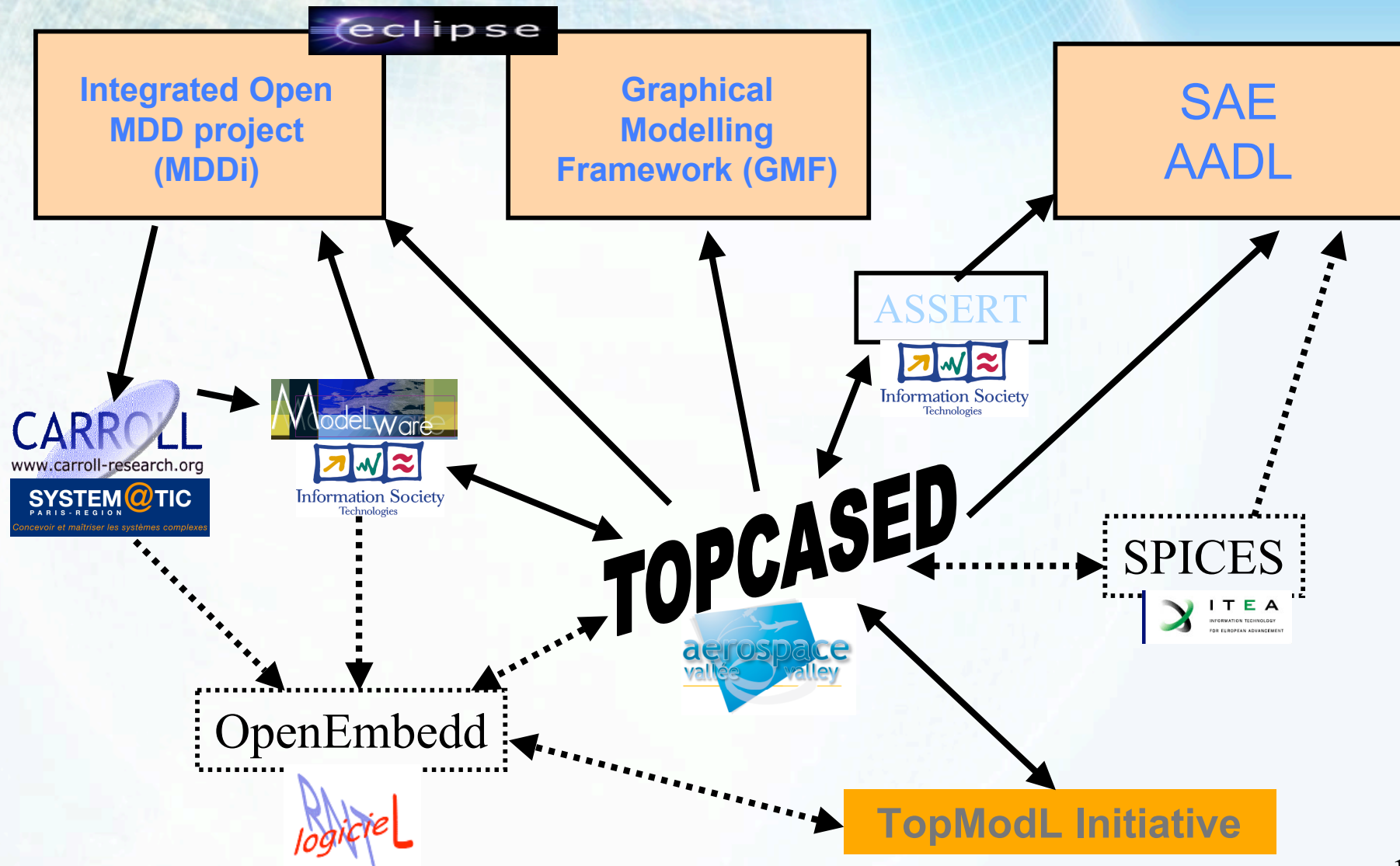
• WP6 – Interconnectivity

• WP7 - Business model

• WP8 - Dependability

Breakdown

WP2 — (Meta-)Model Editor

EXTERNAL TOOLS

Meta-models   Models   Import   export

WP5

Models bus

WP6

Generation

WP4   IDE

VERIFICATION TOOLS   WP3

Files exchanges

Version control tool

Collaboration with others group/program

June 05 - IRISATECH

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AIRBUS

**AN EADS JOINT COMPANY
WITH BAE SYSTEMS**