

An Open Source Approach for Industrializing Research Tools

Hugo Bruneliere
AtlanMod Team (INRIA, EMN & LINA)

November 24, 2011
"Open Source Innovation Catalyst"
(ICT Labs, IRILL)

OW2Con 2011, Orange Labs, Paris

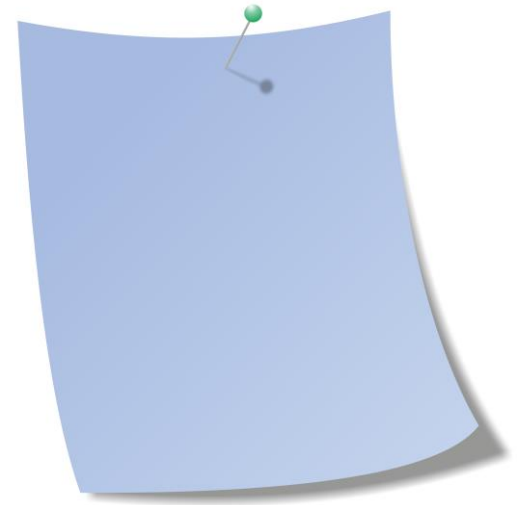
AtlanMod: An Expert Research Team in Modeling

- A common team based in Nantes
 - INRIA, Ecole des Mines de Nantes & LINA
- Expertise on **Model Driven Engineering**
 - MDE principles & techniques
 - “Modeling Technologies for Software Production, Evolution, and Operation”
- **Application-driven research**
 - Constant collaboration with companies
- **Open source** community via **Eclipse**
 - MoDisco, AM3, EMF Facet, ATL, AMW, etc



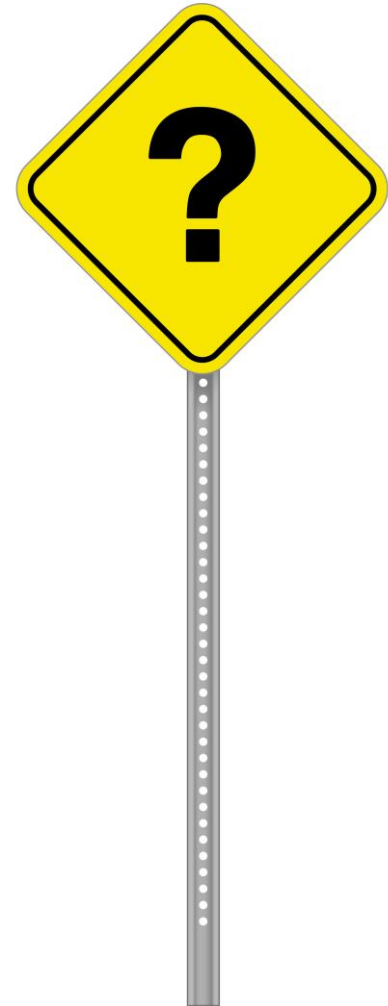
Outline

- The starting point?
 - Research prototypes...
- What means **industrializing**?
 - Traditional definitions
- Which **business model**?
 - A **different approach**
 - **Open source** as a medium
- Success stories?
 - Eclipse-M2M **ATL** & Eclipse-MDT **MoDisco**



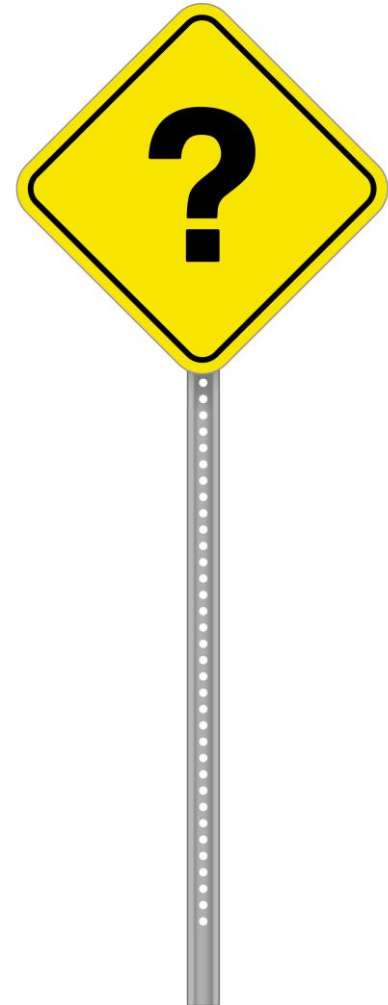
The starting point?

- Research prototypes!
- Tools as proof of concepts for research ideas
 - Empirical validation
 - Feedback from real users
 - Dissemination of the results
 - Collaboration playground
 - Etc
- But...

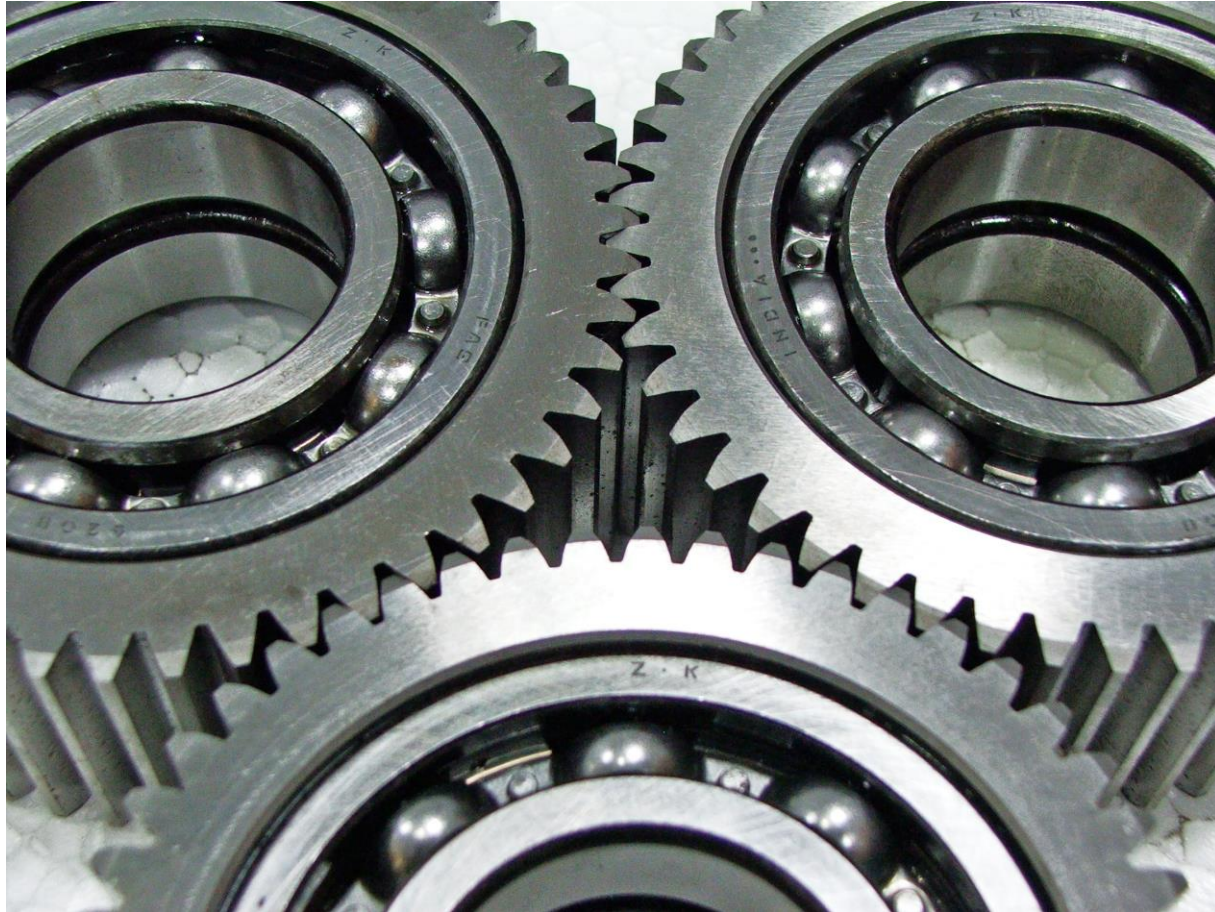


The starting point?

- The problem
 - Research labs have to focus on core research activities
 - Funding criteria...
 - Companies usually don't adopt research tools
 - Lack of (user) support
 - Maintenance issues
 - Scalability limitations
 - Adaptation capabilities



What means "industrializing"?



What means “industrializing”?

- Simple definitions (based on Wikipedia)
 - Innovation
 - The creation of better or more effective ideas, processes, technologies, products to be brought to the market & society
 - Technology transfer
 - The process of spreading this innovation and related skills or knowledge among different organizations
 - Industrialization
 - The process of changing a human group or tool from an elementary state to an industrial one

What means “industrializing”?

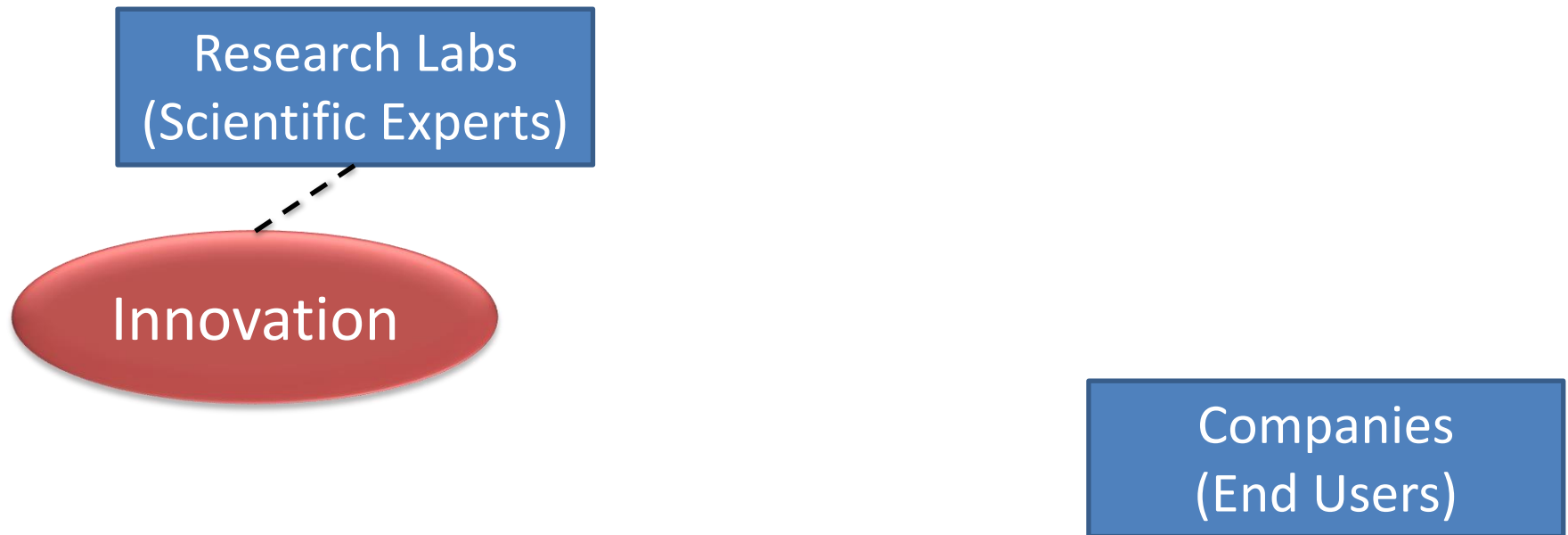
- Traditional direct approach

Research Labs
(Scientific Experts)

Companies
(End Users)

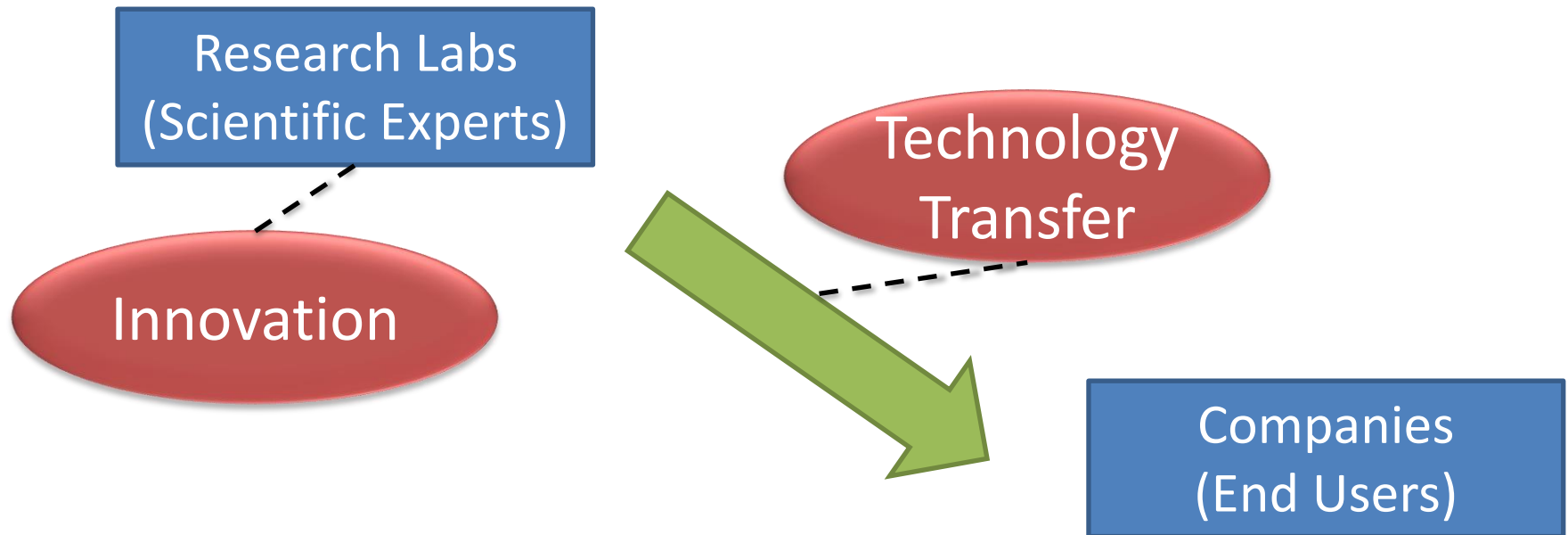
What means “industrializing”?

- Traditional direct approach



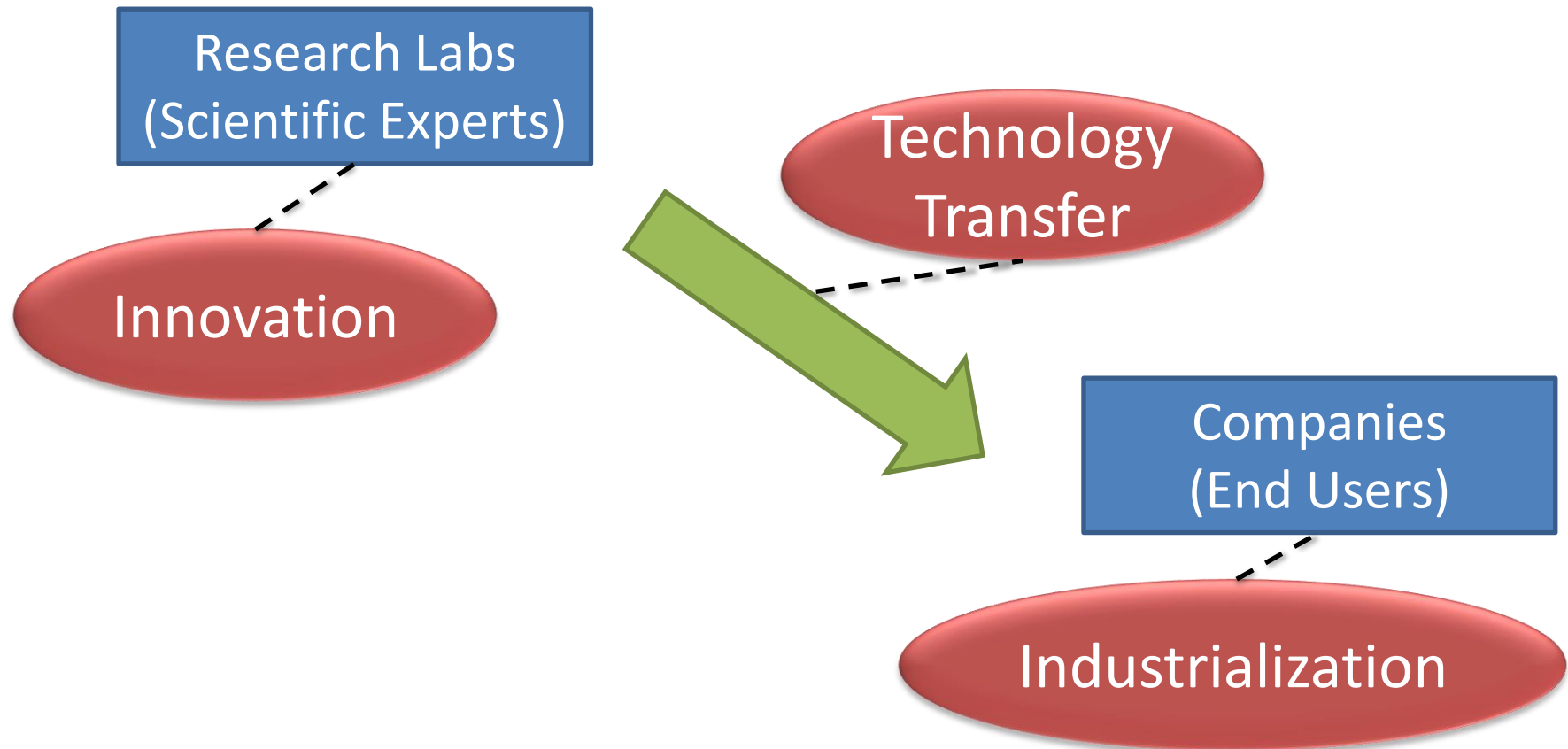
What means “industrializing”?

- Traditional direct approach



What means “industrializing”?

- Traditional direct approach



Which “business model”?



Which “business model”?

- Open Source as a medium
 - Creation of communities
 - Stimulation of initiative
 - Dissemination of results
 - Standardization



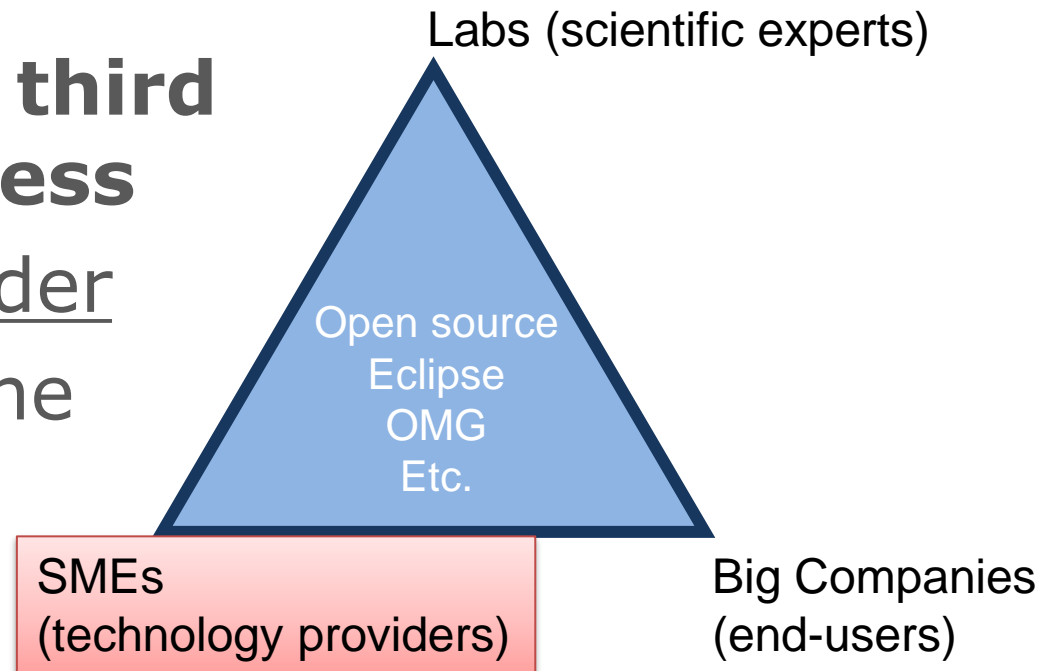
- But this is not enough...



- Success of involving external contributors?
 - *[S. Krishnamurthy, Cave or community? an empirical examination of 100 mature open source projects]*
- Challenging vs. Pragmatic?
 - Prioritization of problems

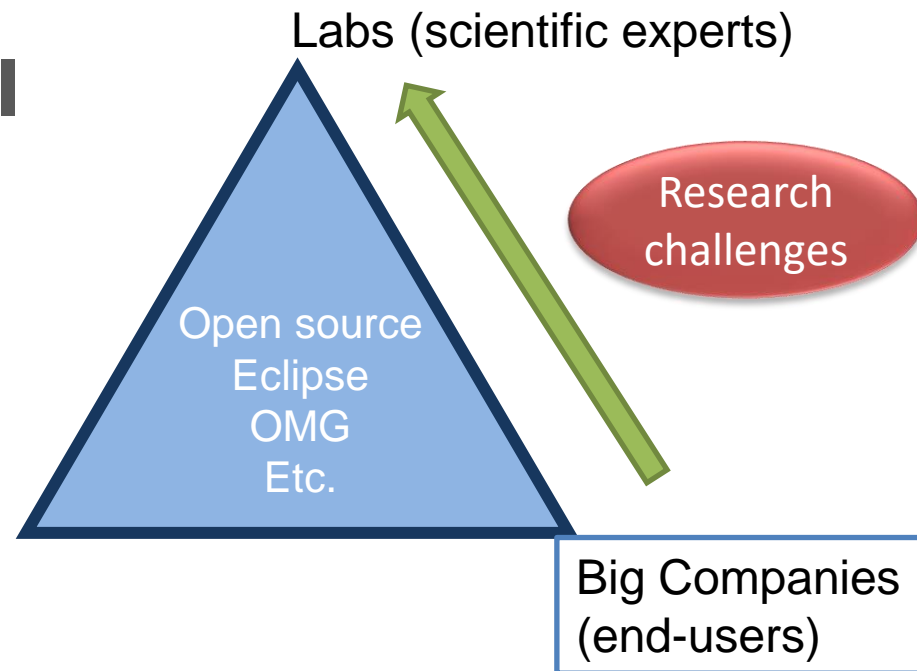
Which “business model”?

- Three-entity approach
- **Introduction of a third entity in the process**
 - Technology Provider
 - Play the role of the interface...



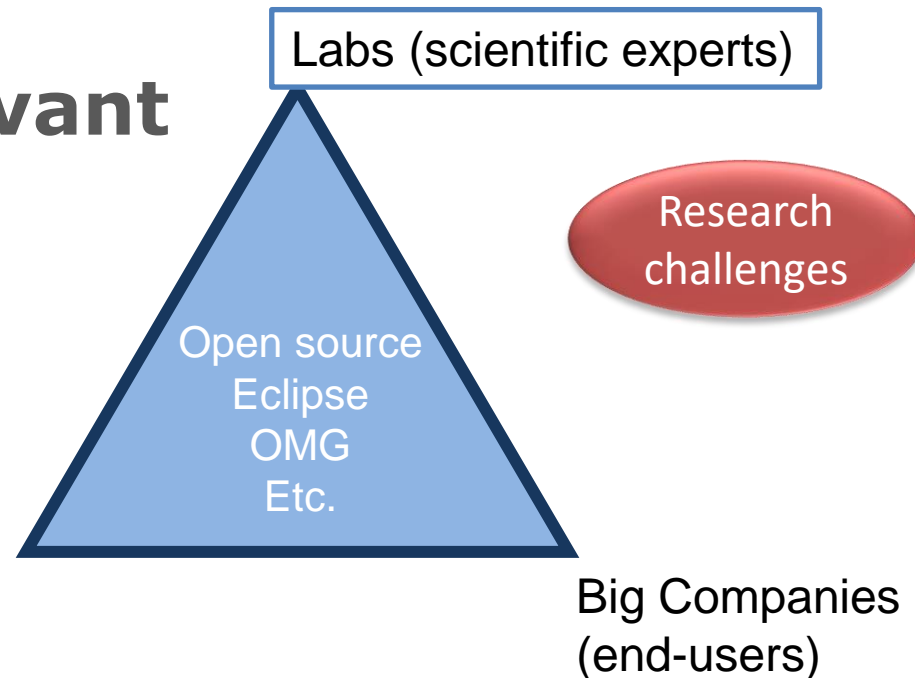
Which “business model”?

- Three-entity approach
- **1. Description of real challenges**
 - Concrete problems
 - Industrial use cases



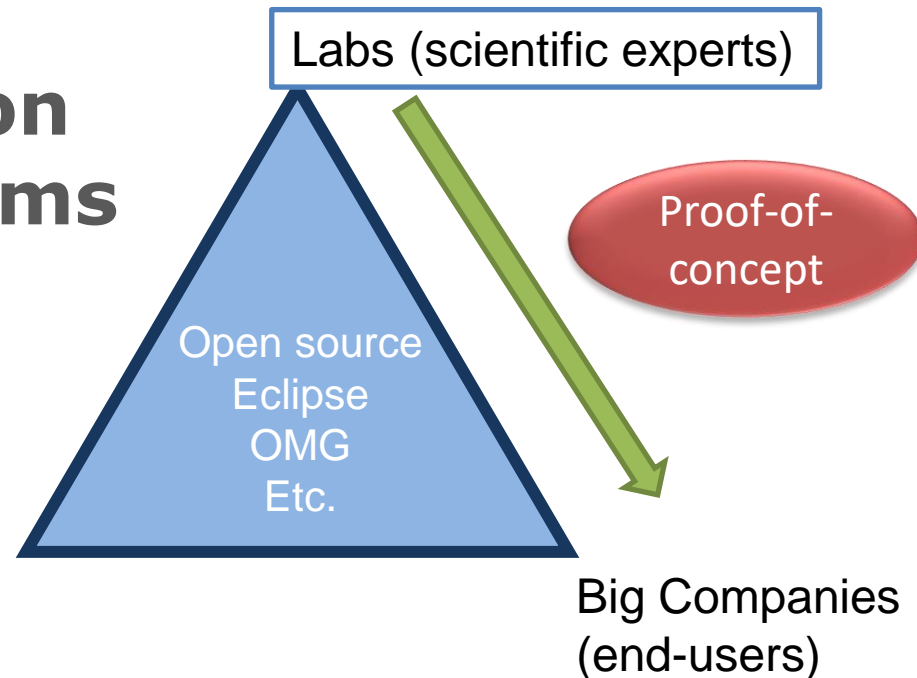
Which “business model”?

- Three-entity approach
- **2. Evaluation of relevant research problems**
 - State-of-the-art
 - Possible ideas
 - Solutions...



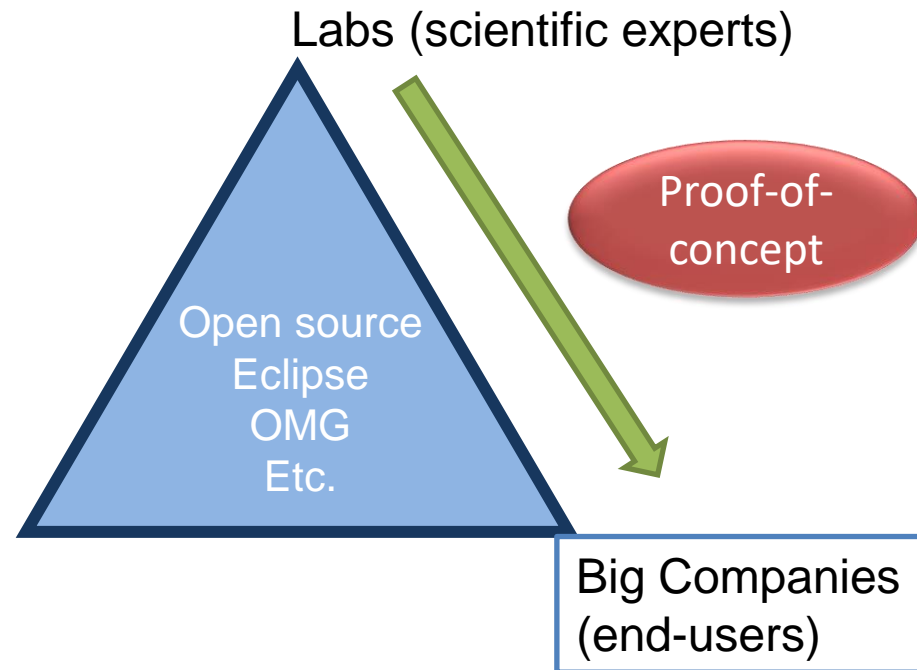
Which “business model”?

- Three-entity approach
- **3. Experimentation on the identified problems**
 - Research work
 - Paper publication
 - Prototype implementation



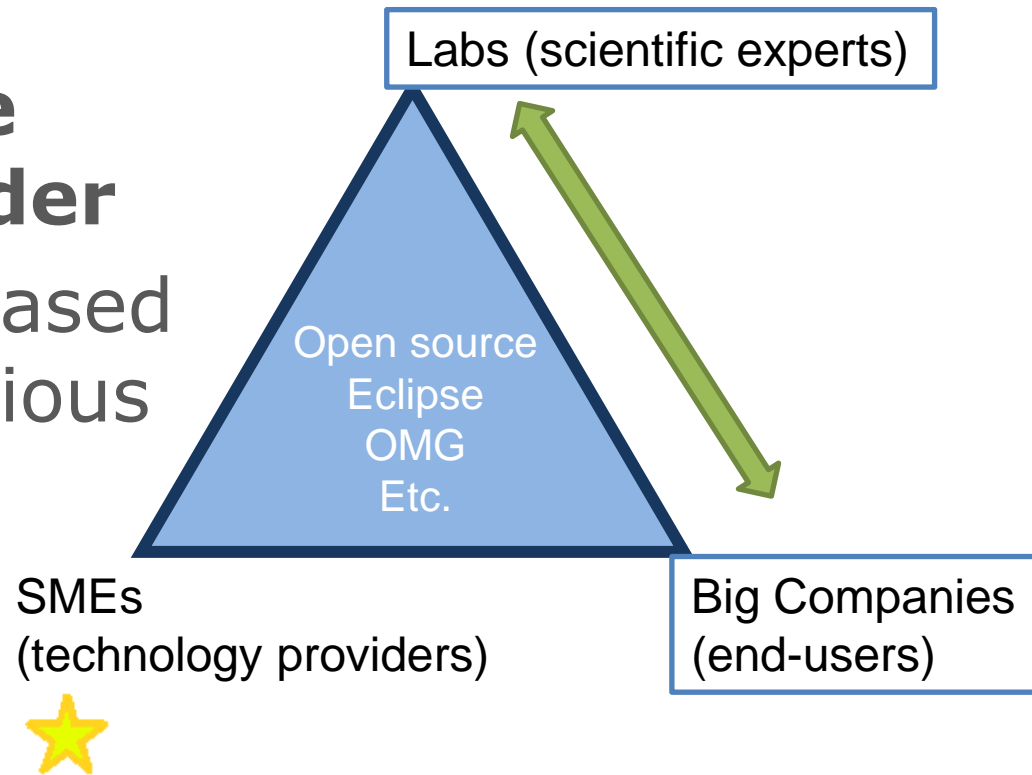
Which “business model”?

- Three-entity approach
- **4. Evaluation of the proposed solution**
 - Relevance
 - Potential concrete applications
 - Industrialization?



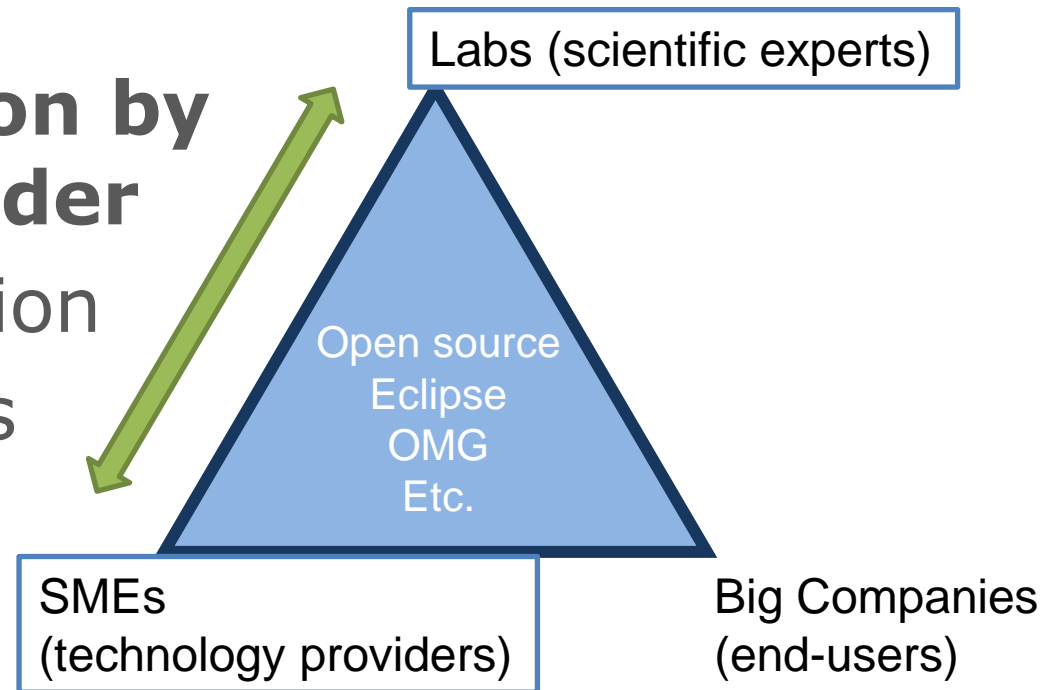
Which “business model”?

- Three-entity approach
- **5. Selection of the Technology Provider**
 - Common action based on skills and previous experiences



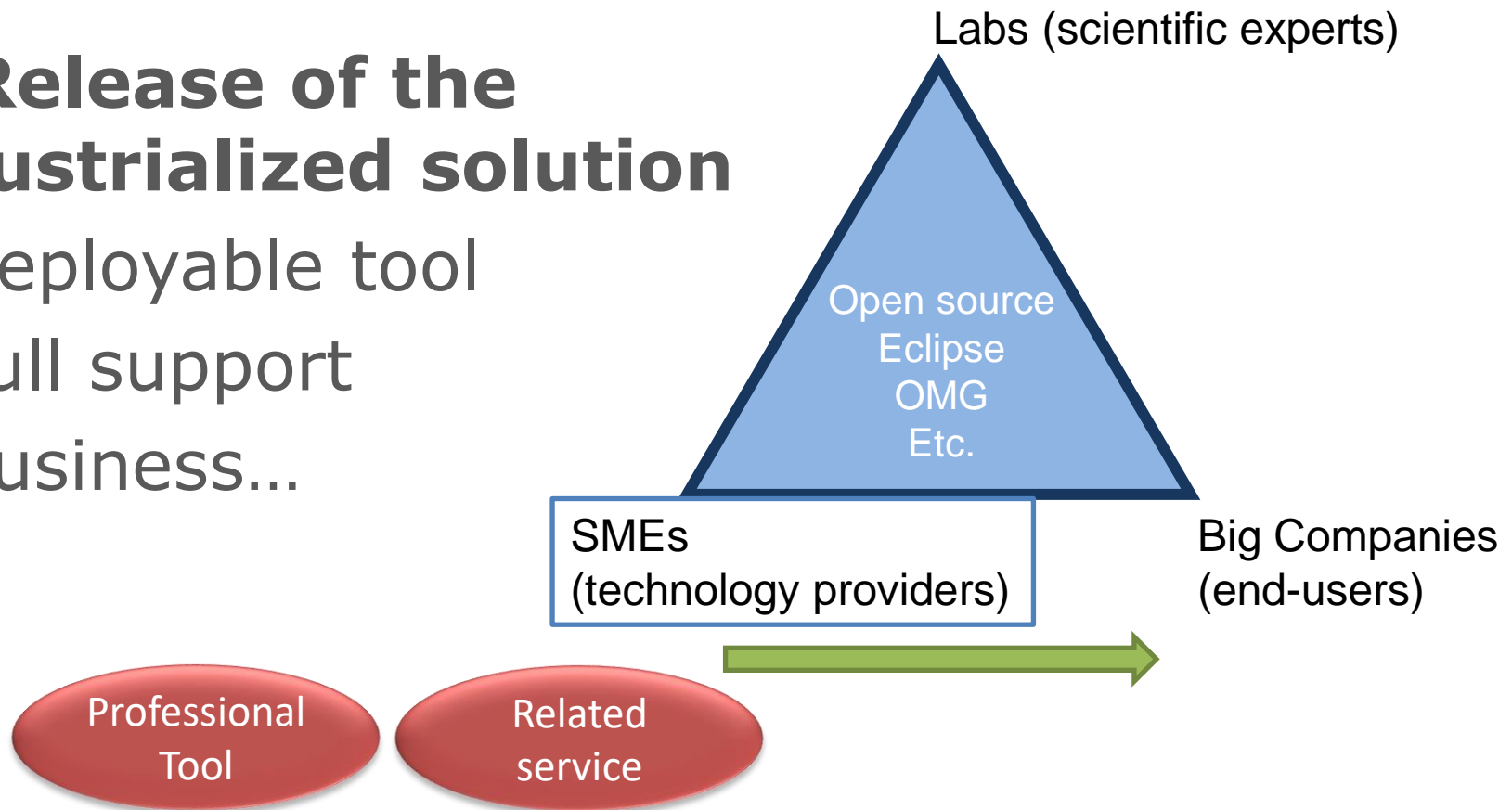
Which “business model”?

- Three-entity approach
- **6. Industrialization by Technology Provider**
 - Collaborative action
 - Several iterations
 - Scientific and technical expertise



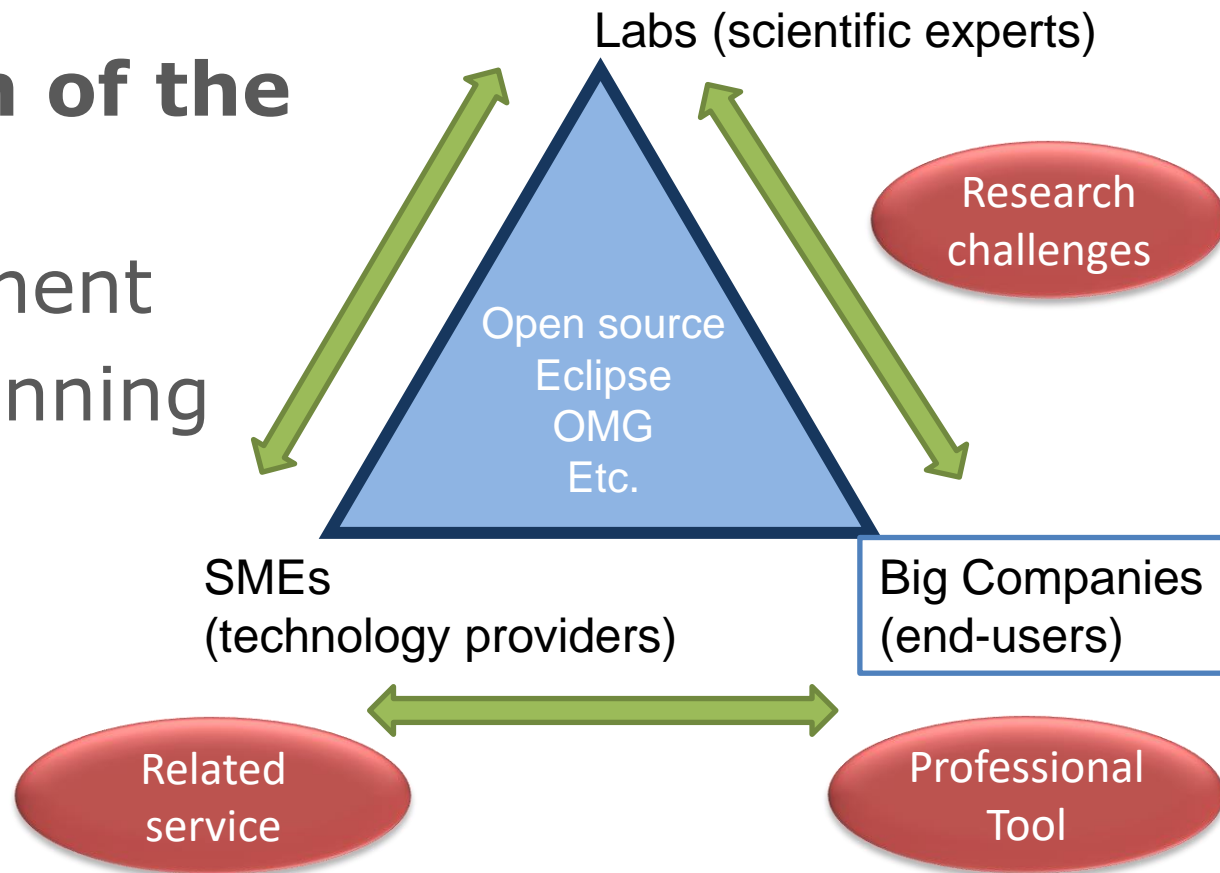
Which “business model”?

- Three-entity approach
- **7. Release of the industrialized solution**
 - Deployable tool
 - Full support
 - Business...



Which “business model”?

- Three-entity approach
- **8. Application of the solution**
 - Real deployment
 - Execution/running
 - Feedback
 - Consulting...



Which “business model”?

- Benefits for all the partners

Research Lab (Scientific Experts)	Big Company (End User)	SME (Technology Provider)
Focus on core activity: Research	Focus on core activity: Business	Focus on core activity: Tooling & Service
Work on real industrial challenges	Work on its actual problems	Work on its technical expertise
Publication of quality scientific papers	Deployment & running of a customized solution	Development of a software offer (product & service)

Which “business model”?

- Summary
 - **Win-win business model**
 - Focus on core activities
 - Benefit from the others’ results
 - **Application-driven approach**
 - End-user is at the origin
 - Relevant solutions
 - **Iterative process**
 - Regular exchanges between partners

Success stories?



Success stories?

- Application of the proposed approach
 - Initiation within European projects (targeting real industrial scenarios)
- Use of the **Eclipse: open source** medium
 - Creation of dedicated Eclipse projects (tool, support and community)
- Collaboration with technology providers
 - Development of the expertise

Success stories: Eclipse-M2M ATL

- An **Eclipse environment** to support the development & execution of **Model-to-Model** transformations



- Official Eclipse Modeling project (in M2M)
 - Open-source (EPL)
 - Based on the Eclipse Modeling Framework (EMF)
 - Using the Object Constraint Language (OMG OCL)
 - Released with Ganymede, Helios & Indigo
- Complete Eclipse Tooling
 - ATL language (declarative, QVT-like)
 - ATL Virtual Machine (VM)
 - ATL Integrated Development Environment (IDE)
 - ATL use case & transformation library



Success stories: Eclipse-M2M ATL

- Developed within the context of the MODELWARE European project
 - France Telecom, THALES
- Useful links
 - ATL homepage
 - <http://www.eclipse.org/atl/>
 - ATL documentation
 - <http://www.eclipse.org/atl/documentation/>
 - M2M forum (use the [ATL] tag in the subject)
 - <http://www.eclipse.org/forums/eclipse.modeling.m2m>



Success stories: Eclipse-MDT MoDisco

-  An **Eclipse framework** to support the elaboration of **MDRE** solutions

- Official Eclipse Modeling project (in MDT)
 - Open-source (EPL)
 - Based on other Eclipse Modeling projects
 - Released with Helios & Indigo



- Supported by the  **OMG**
OBJECT MANAGEMENT GROUP
 - Reference implementations for
 - KDM (Knowledge Discovery Metamodel)
 - SMM (Structured Metrics Metamodel)
 - ASTM (Abstract Syntax Tree Metamodel)



Success stories: Eclipse-MDT MoDisco

- Developed within the context of the MODELPLEX European project
 - THALES, Schlumberger Western Geco
- Useful links
 - MoDisco homepage
 - <http://www.eclipse.org/MoDisco>
 - MoDisco wiki (all resources)
 - <http://wiki.eclipse.org/MoDisco>
 - MoDisco forum
 - <http://www.eclipse.org/forums/eclipse.modisco>



Thanks for your attention!

- Eclipse Projects links
 - M2M **ATL**: <http://www.eclipse.org/atl>
 - MDT **MoDisco**: <http://www.eclipse.org/MoDisco>
- Industrialization approach
 - **Industrialization of Research Tools: the ATL Case**, WASDeTT-3, ASE 2010, Antwerp, Belgium, September 20, 2010
- Team contacts
 - Jordi Cabot (Team leader)
 - jordi.cabot@inria.fr
 - Hugo Bruneliere (Eclipse responsible)
 - hugo.bruneliere@inria.fr

