Polarsys
End User Benefits

Risks identified with proprietary software

- Niche tool vendors may get acquired by larger companies, disappear or change their technical focus

- Product strategy change, products may also vanish

- Typically less than 20 % of end user feature requests end up in proprietary product

- Licenses cost and restrictions makes it harder for large scale deployment

Drawbacks of closed innovation

- Adaptations are unsustainable with closed data format
- Innovation suffers when development is done in isolation
- Some innovation do not have a business case for tool vendors
- Industrial users can end up paying large amounts for improvements which can then be used by competitors who have a normal license cost
- Security concerns cannot be addressed by code inspection
- Learning curve, skills availability

Support duration concern

- Proprietary software hardly reaching 10 years of support
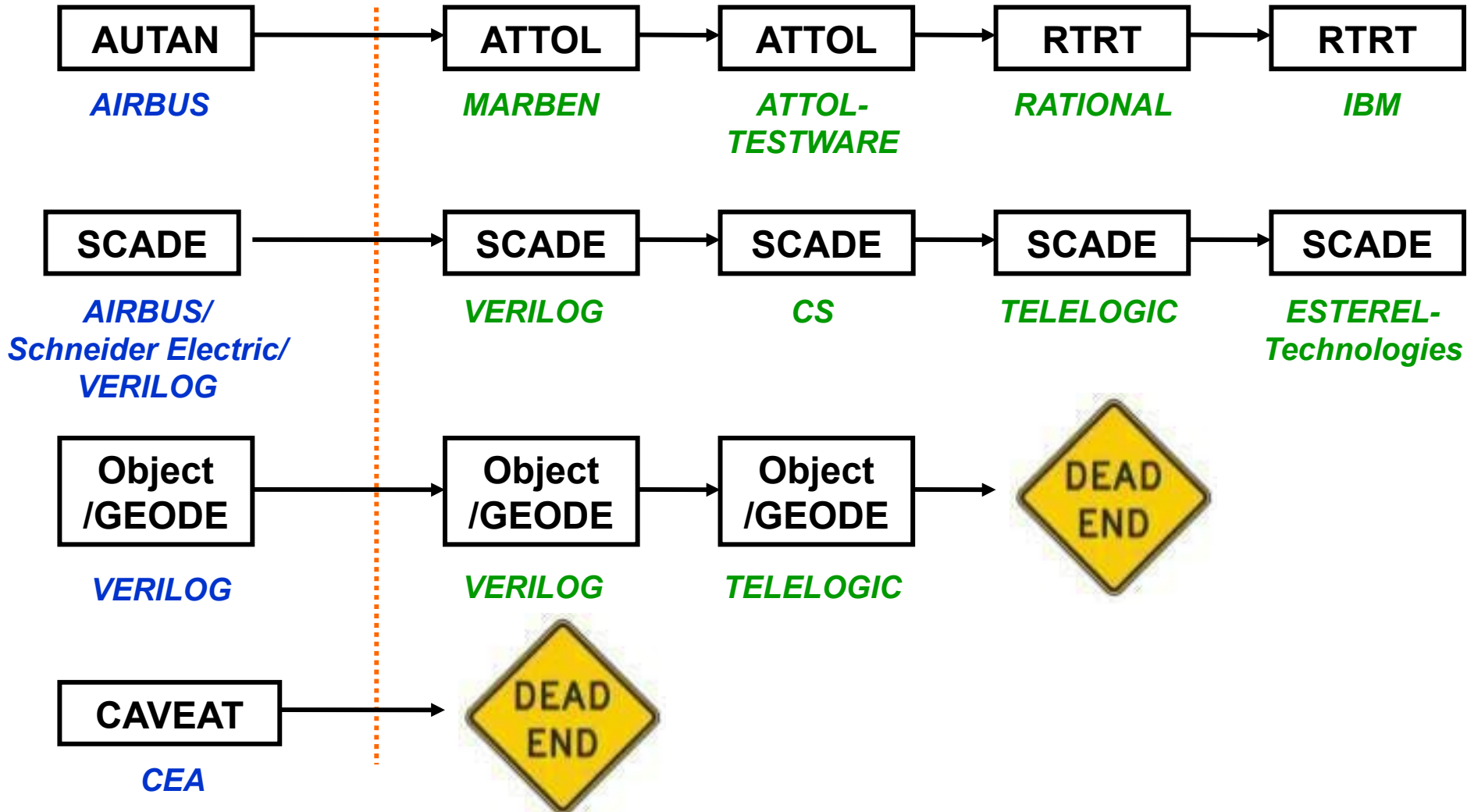- Embedded systems have a life-cycle reaching more than 10 years

Aeronautics	Healthcare
Automotive	Railway
Defense	Space
Energy	Telecommunication

Mastering? Continuity? > 10 Y

**Industry /
research centres**   **Commercial world**

AUTAN	→	ATTOL	→	ATTOL	→	RTRT	→	RTRT
AIRBUS		*MARBEN*		*ATTOL-TESTWARE*		*RATIONAL*		*IBM*

SCADE	→	SCADE	→	SCADE	→	SCADE	→	SCADE
AIRBUS/ Schneider Electric/ VERILOG		*VERILOG*		*CS*		*TELELOGIC*		*ESTEREL-Technologies*

Object /GEODE	→	Object /GEODE	→	Object /GEODE	→	DEAD END
VERILOG		*VERILOG*		*TELELOGIC*		

CAVEAT	→	DEAD END
CEA		

Open Source as an enabler for

- Migration

- Interoperability

- Extensibility

- Open innovation

- Long term support

- Combination of make and buy

Open Source Definition

http://opensource.org/docs/osd

- Free re-distribution of software
- Availability of source code with software
- Derived works allowed
- Integrity of author's source code be maintained
- No discrimination against persons or groups
- No discrimination against fields of endeavor
- Distribution of license
- License must not be specific to product
- License must not restrict other software
- License must be technology-neutral

Better Features
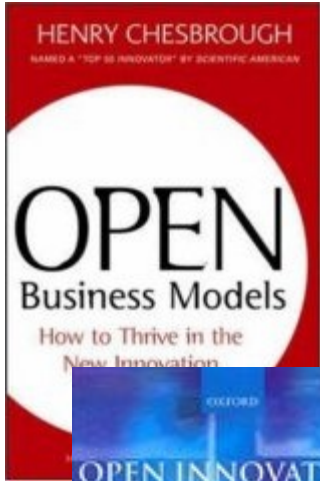
Innovation / new ideas from other companies

Open Innovation paradigm treats R&D as an open system

Firms can and should use external ideas as well as internal ideas

Brainstorming with experts from different companies = better features

Open Innovation: Researching a New Paradigm, e.g. IBM 500 US patent for Linux
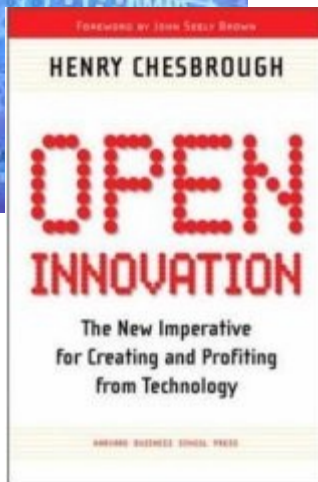
Better Support

- Direct access to developer

- Access to an open source community

- The same people developing the adaptations are developing the main product and handling support, this is typically not case with proprietary tools

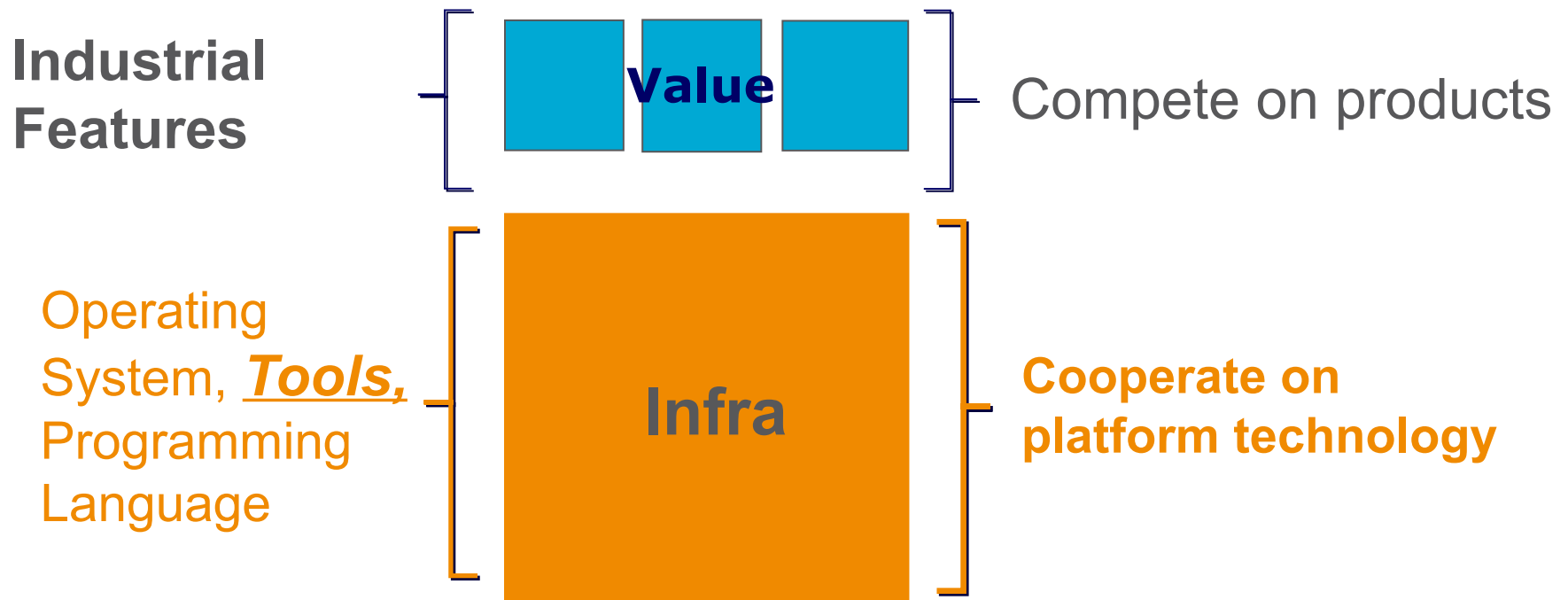- Fast availability of bug fixes and workarounds

Better Support

- Support is at the core of the business model for Open Source companies

- Support commitment typically through support subscriptions

- Capability to contract with several actors

Software Development Cost Structures

Majority of costs can go to build and support infrastructure for which companies derive zero differentiating product value.

Focus all possible energies on value, and get everything else from open source, or help build it in open source

Industrial Features

Value

Compete on products

Operating System, _Tools_, Programming Language

Infra

Cooperate on platform technology

Lowering barrier for technology adoption

Universities rely on open source tools

Developers use open source tools

Open Source is now mainstream in the industry (cf Gartner survey 02/2011)

- 50% organizations adopted OSS solutions

Better adoptions = easier deployments.

Development Speed

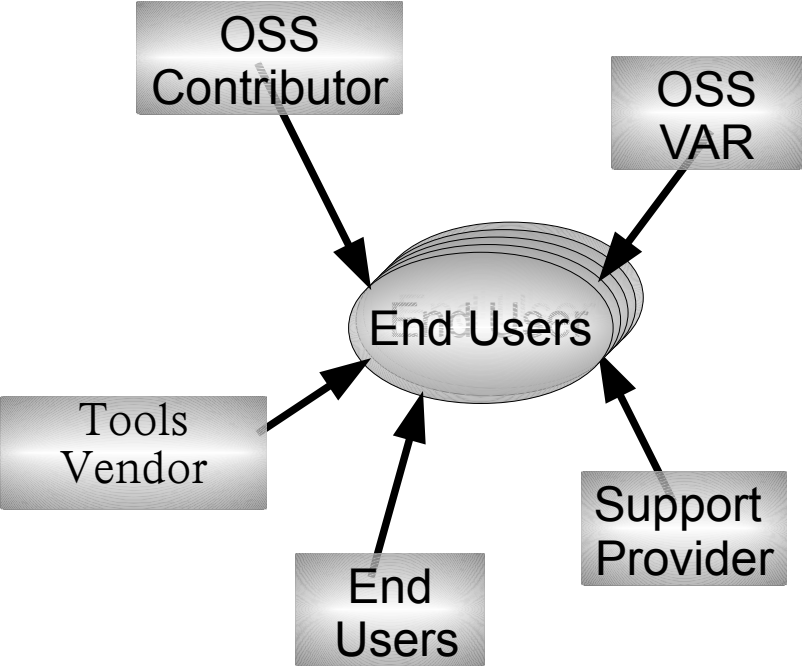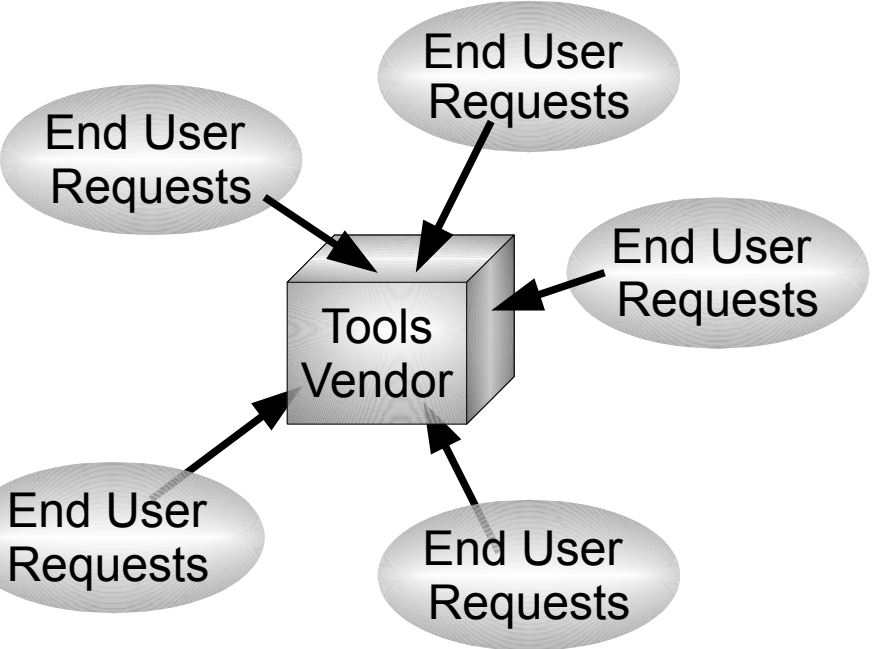Small Learning Curve

Innovation, advanced feature

More Features

Re-Use

↓Cost ↑Improvement Budget

Controlling our own destiny

Switching to an Industrial User Strategy

Users need to adapt to the tools
Typically less than 20% Features Requests
accepted

Usual Tools Vendor ecosystem

Users get the right tools for their needs
At least **80%** Features Requests implemented as
generic features
20% implemented as user extensions
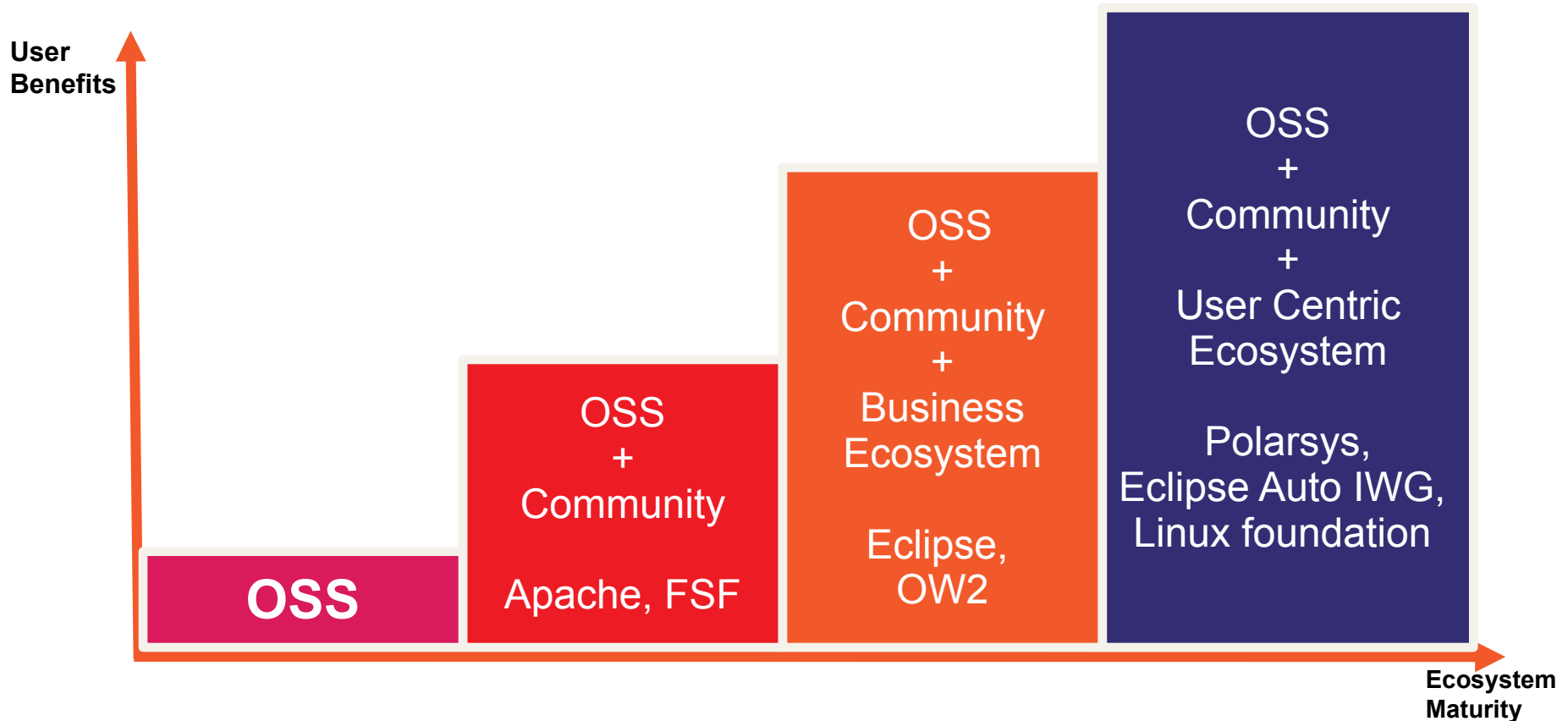
Polarsys Target ecosystem

Open source license is not enough for industrial end users

- IP Management
  - Licenses management
  - Copyright
  - Code traceability & ownership
- Manage inconsistency and incompleteness
  - Project fragmentation, integration
- Quality and Maturity
- Need for collaboration infrastructure
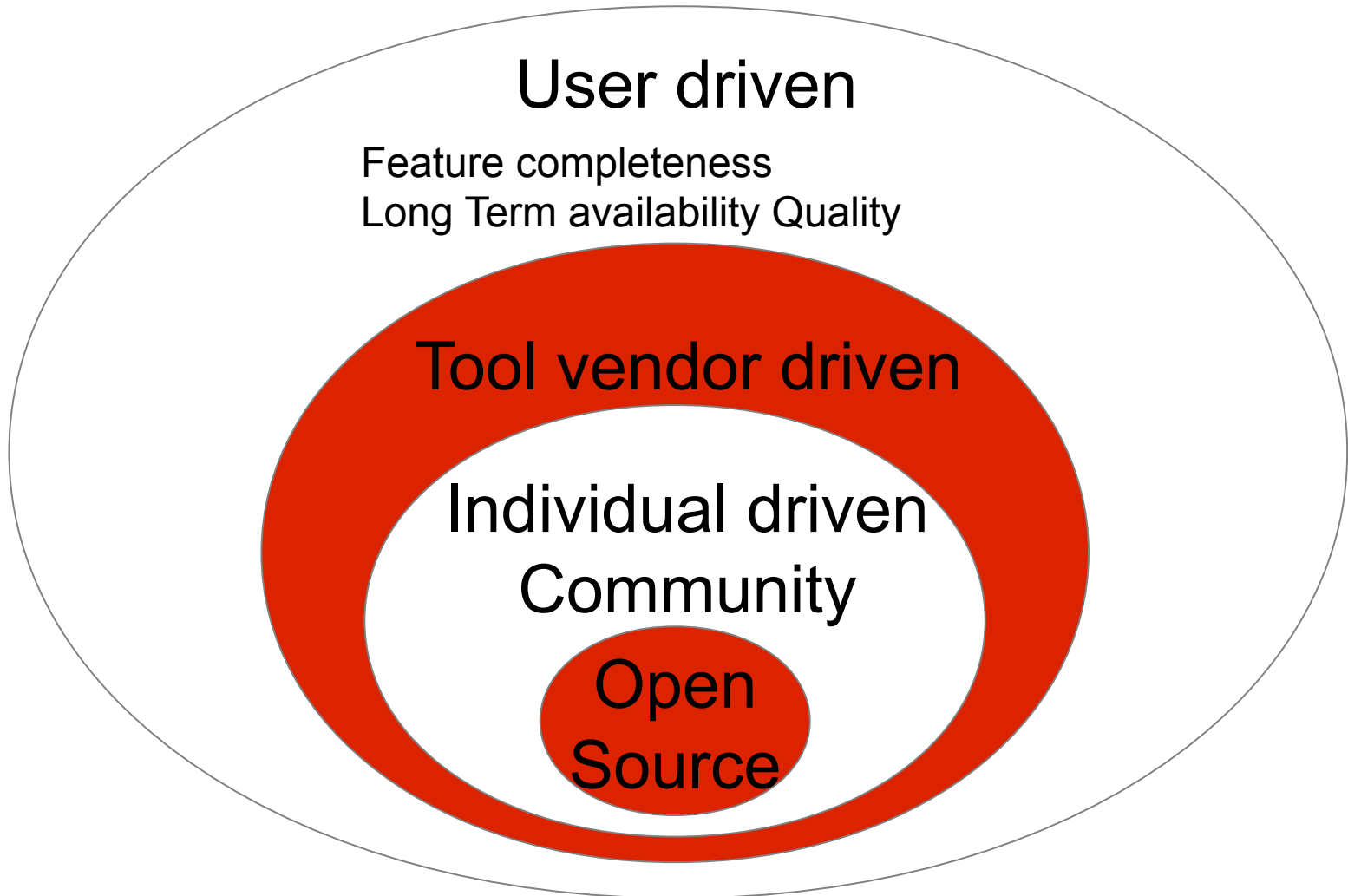- Governance model, e.g. how can someone become a committer

Open source license is not enough for industrial end users

- Ecosystem development

  - Industrial User centric

  - Access to skilled professionals

  - Training, Support, Maintenance

  - Share development of common features between industrial users

- Need for a neutral shared infrastructure

  - Processes to assess tool maturity

    - Share documents for tool certification

  - Very Long Term Support

A new step in the evolution of OSS ecosystems

User driven OSS comunities

User driven

Feature completeness
Long Term availability Quality

Tool vendor driven

Individual driven
Community

Open
Source

Cases studies

Long life cycle in Aeronautics

AIRBUS A300 Life Cycle

Program began in 1972, production stopped in 2007

2007-1972 = 35 years…

Support will last until 2050

2050-1972 = 78 years !!

On board software development for very long lifecycle products

AIRBUS

Topcased sustainability thanks to OSS

- After its acquisition in 2009, Anyware stopped contributing to Topcased.
- Thanks to the Open Source approach
  - The code base has not been lost due to IP (nearly 3M LoC, line A)
  - The ecosystem was strong enough to find other skilled contributors (no change in the development rate, line B)
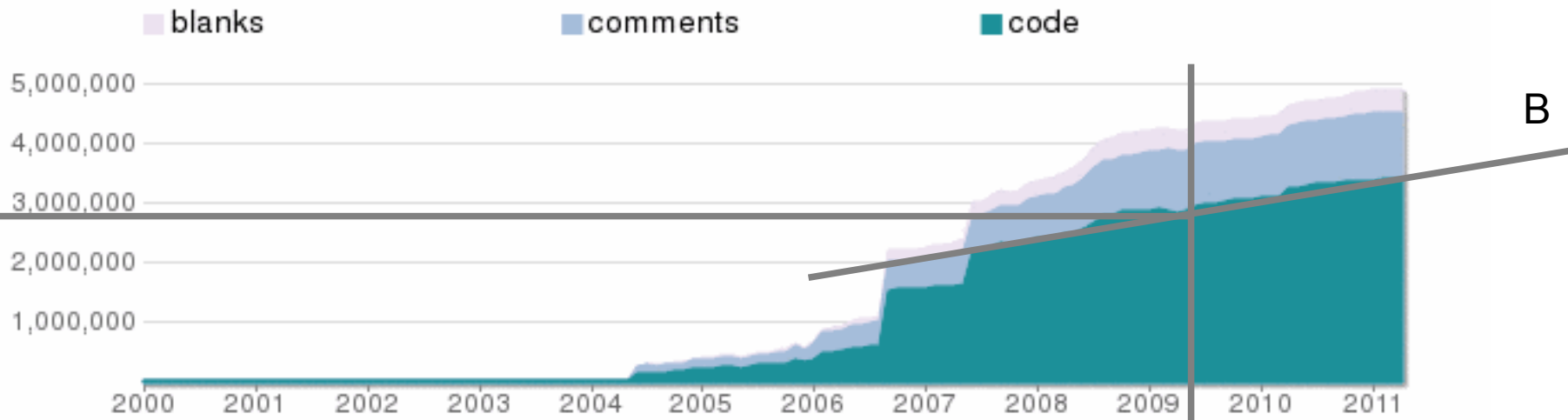
Case Study
Comparing MBSE tool cost from OSS vs proprietary
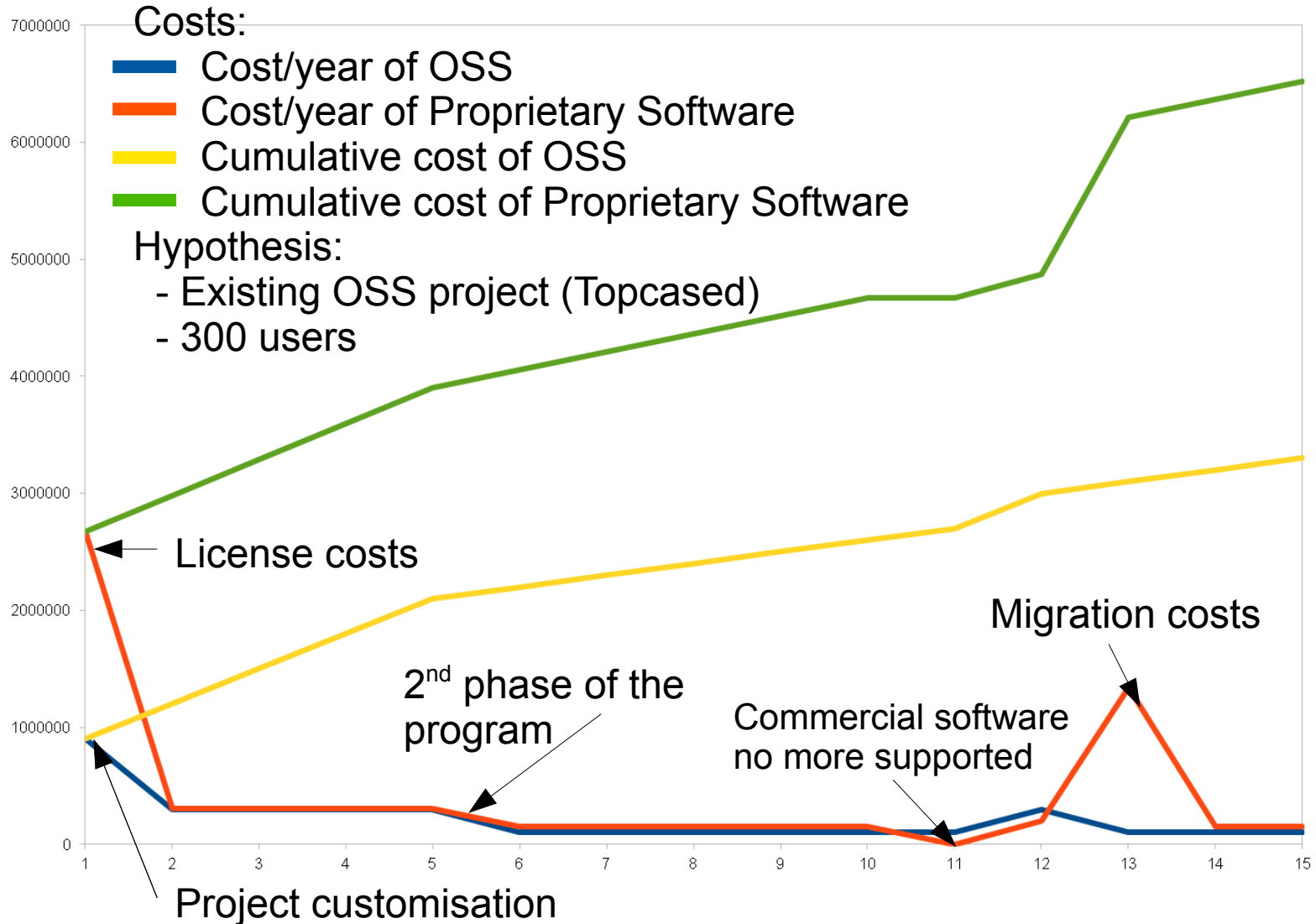
Case Study
Price/Conditions variation for proprietary software

- Clearcase / Clearquest from IBM / Rational are used for On-Board Software Configuration management on all Astrium Satellites projects in France-Germany-UK.

- Some end-user complaints:

  - Maintenance cost price increased in 2011 without any end-user added value : 2009 = 3,2%, 2010 = 3%, 2011 = 8,7%

  - Since Rational was acquired by IBM, lack of reactivity on technical support : some reported problems are waiting during several weeks / months

  - IBM has changed the deployment procedure which is no more compatible with Astrium infrastructure : solution still to be found

Case study
Migration from Rose ➔ Topcased

- Context: 2 Projects, 2 UML Models, 3000 diagrams, about 30 developers using UML tooling

- The version of Rose used by Airbus is no more supported by the tool vendor

- Need to migrate

  - Migration cost: 65k€ (including models, diagrams, SODA templates, specific tooling and reuseable automated migration tool)

  - Migration duration: 8 months

- Other rationales for the migration to an open source solution:

  - None of Airbus bug reports/feature requests have been taken into account by the tool vendor!

  - Make platform upgrade easier and improve productivity.

Polarsys
Industry Working Group
inside

Eclipse History

2001 - Eclipse Project by IBM

2004 - Rich Client Platform

2004 – Independent Organization: Eclipse Foundation

2006 - Callisto Release Train

2008 - Top Level Runtime Project

2009 - Industry Working Groups

2011 – Long Term Support Initiative

Google™ Custom Seard

About Us »

👉 **Foundation**

👉 **Governance**

👉 **Legal Resources**

👉 **Contact Us**

About the Eclipse Foundation

- **What is Eclipse and the Eclipse Foundation?**

- **Services of the Foundation**

  1. **IT Infrastructure**

  2. **Intellectual Property (IP) Management**

  3. **Development Community Support**

  4. **Ecosystem Development**

- **A Unique Model for Open Source Development**

- **What is the history of Eclipse?**

What is Eclipse and the Eclipse Foundation?

Eclipse is an open source community, whose projects are focused on building an open development platform comprised of extensible frameworks, tools and runtimes for building, deploying and managing software across the lifecycle. The Eclipse Foundation is a not-for-profit, member supported corporation that hosts the **Eclipse projects** and helps cultivate both an open source community and an ecosystem of complementary products and services.

Related

- Press

- Memb

- Becon

Thank y

Thanks to
for their ge
infrastruct

Members

Members of Eclipse in Embedded domains

Members By Category

175 members

- 11 Strategic Members

- 1 Enterprise Member

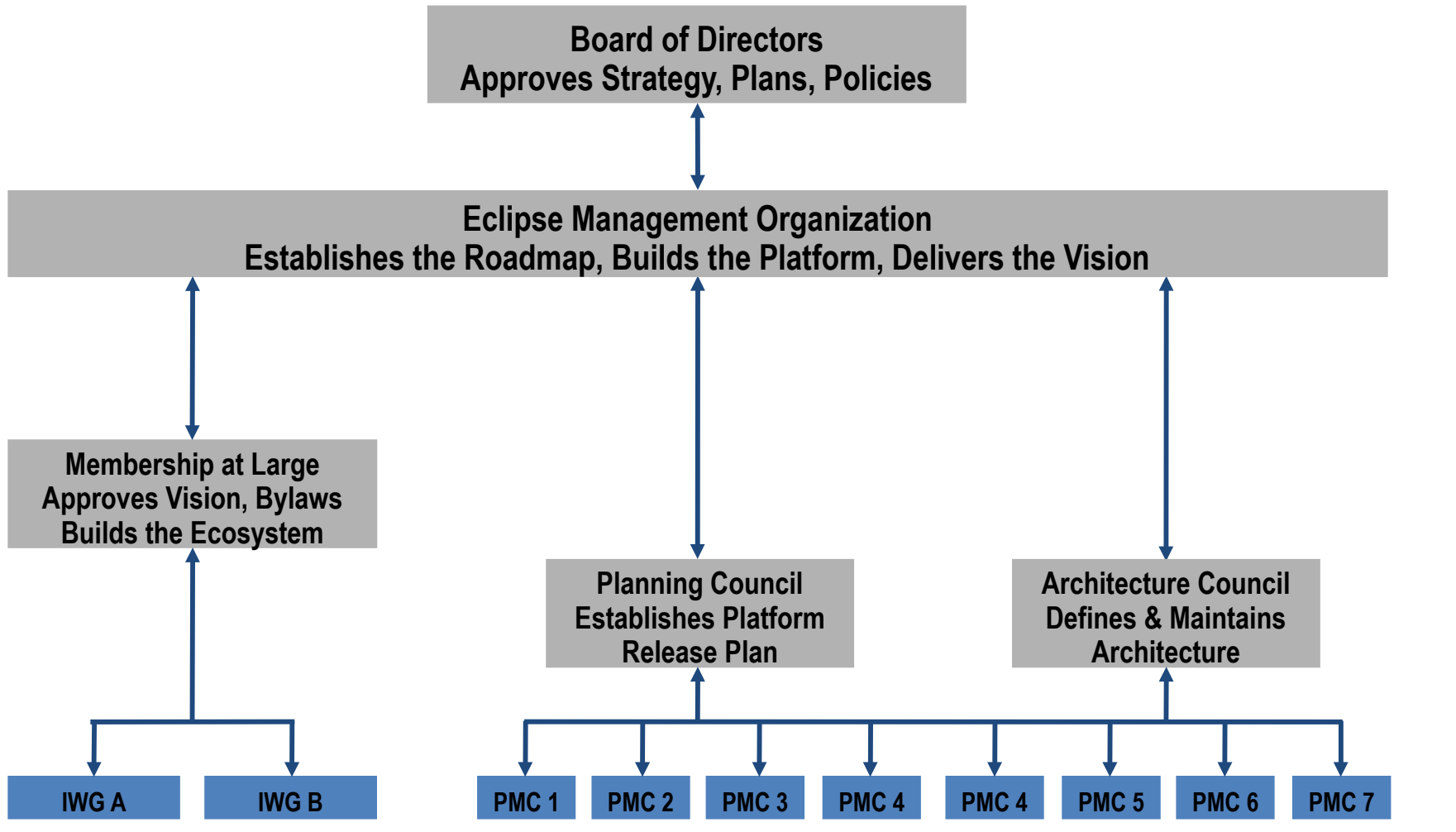1017 committers, representing 75+ organizations

Strategic Members

Enterprise Members

Eclipse Governance Structure

World Class Reliability

Indigo
62 Projects
46 Million Lines of Code
400+ committers
49 companies
18 countries
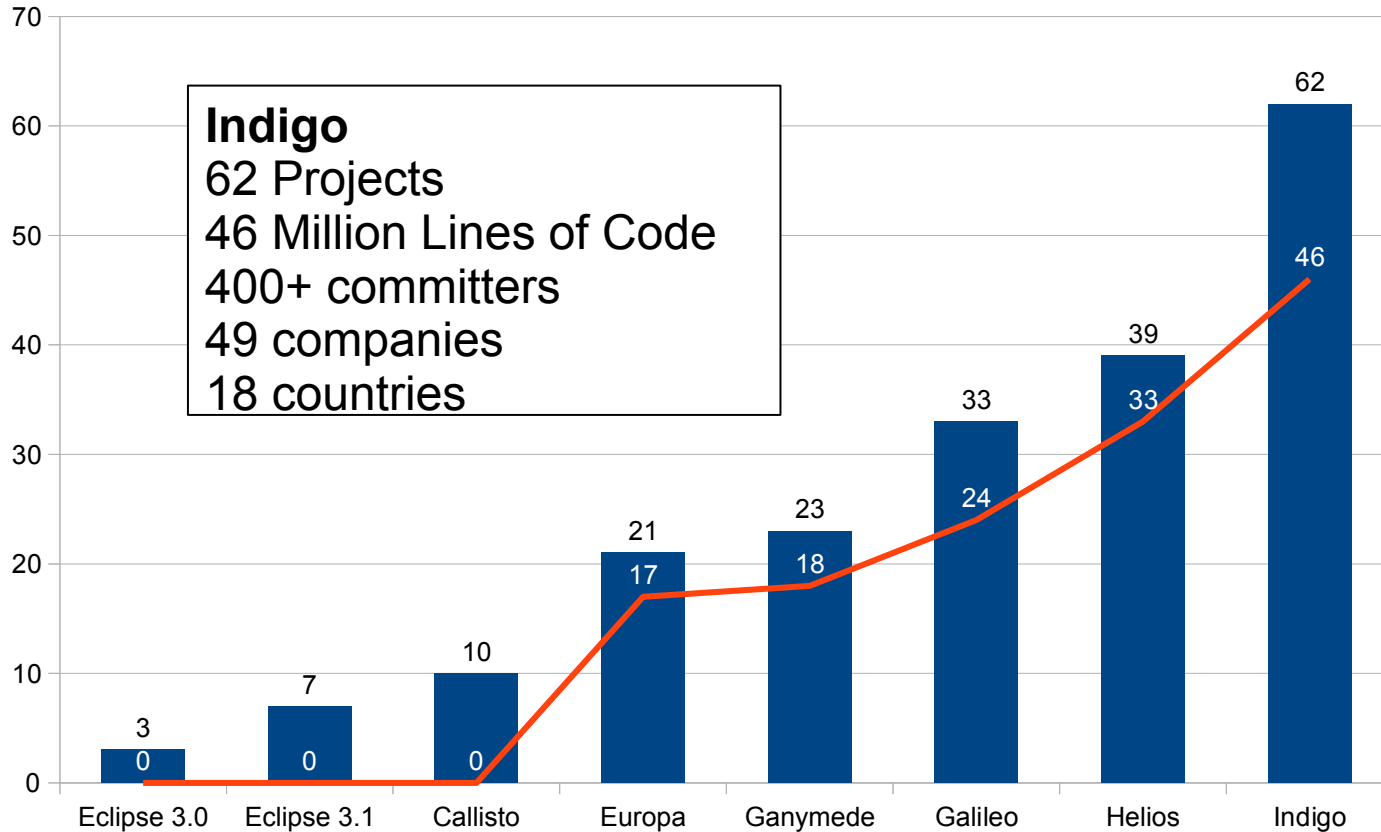
Industry Orientation

2009 – Definition of Industry Working Groups

2010 – Automotive IWG

2011 – Long Term Support IWG

2012 – Polarsys IWG

Polarsys Technological Domains

■ Polarsys Scope

BUSINESS DOMAINS LEVEL

Requirement Engineering	Architecture & design	HW / SW Development	Verification & Validation	Quality & Conf mgt

[TBD]

ENGINEERING DOMAINS

Model EDition	Transformation Technology	Model to model	Model to text & code	Model Transformation	Model Merge	Reverse Engineering	Generation	Refactoring	Simulation	Model simulation	Co-simulation	Model Animation	Interoperability	Verification	Verification on models	Verification on code

...

...

CORE TECHNOLOGY DOMAINS

TECHNOLOGICAL DOMAINS LEVEL

Resource Management	Communication Support	Conf & Change Mgt	Components Catalog	Release Engineering

INFRASTRUCTURE LEVEL

Polarsys Candidate Components

Polarsys Infrastructure = Repository + Infra-tools
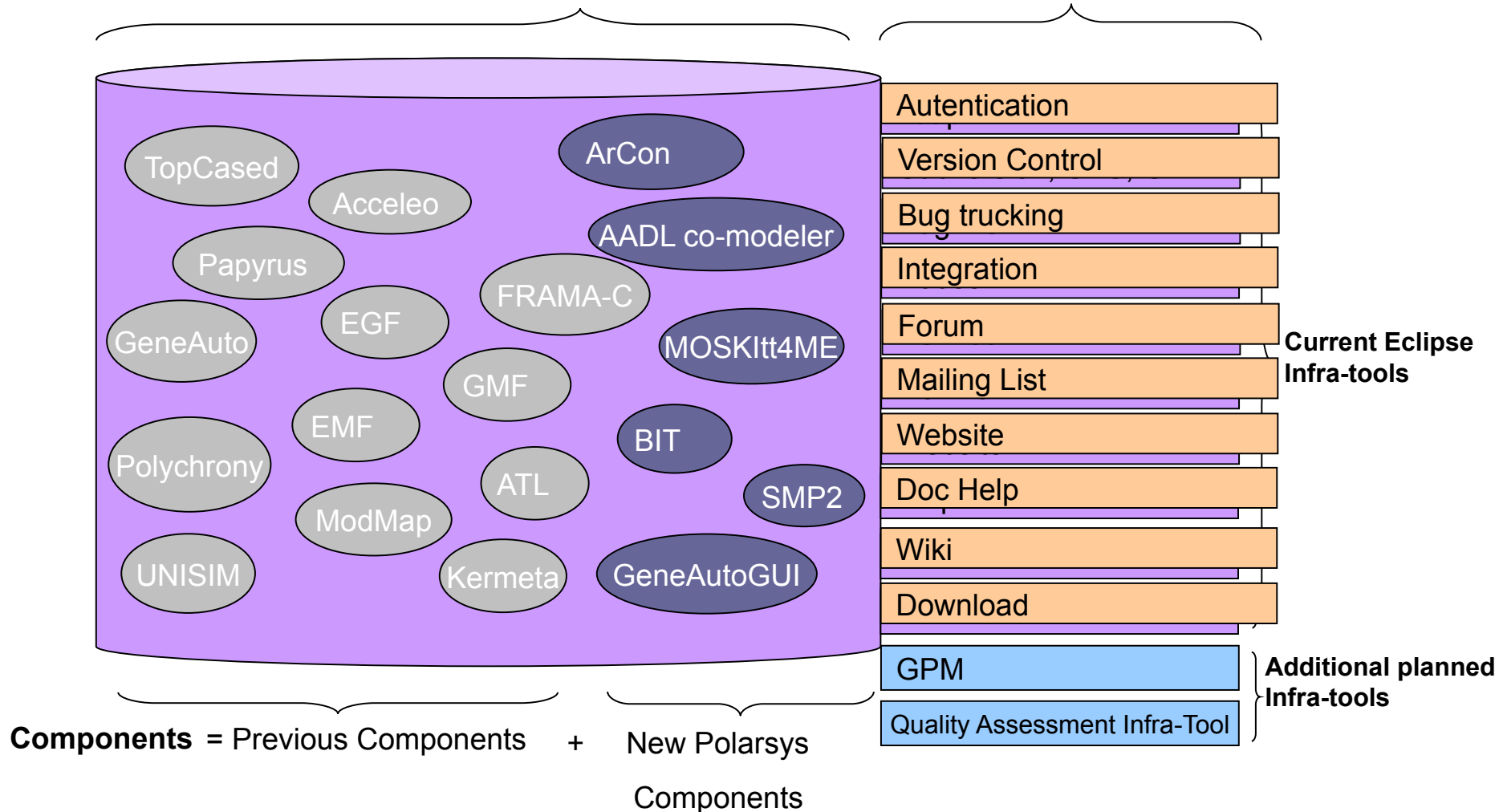
OSS collaboration infrastructure (Provided by Eclipse)

- Collaboration infrastructure

  - Source code repositories, forum, mailing list, wiki, …

  - Development process, meritocracy, ...

- Intellectual Property Management

  - License management

  - Copyright

  - Contribution traceability & ownership

  - Manage licenses compatibility

Polarsys Long Term Support

- Vendor neutral approach for
    - Long Term Availability
    - Ensure shared best practices
    - No vendor lock-in on build processes
- Not an intermediary between Providers and Users
- Common infrastructure (CBI) operated by the Eclipse Foundation
- Provides VLTS
- Foster the Long Term Support Ecosystem
- Private LTS binaries

Polarsys Qualification kits

- Qualification Kits are Polarsys private documents
- Provide base documents to be adapted for specific certification process
  - Component development plan
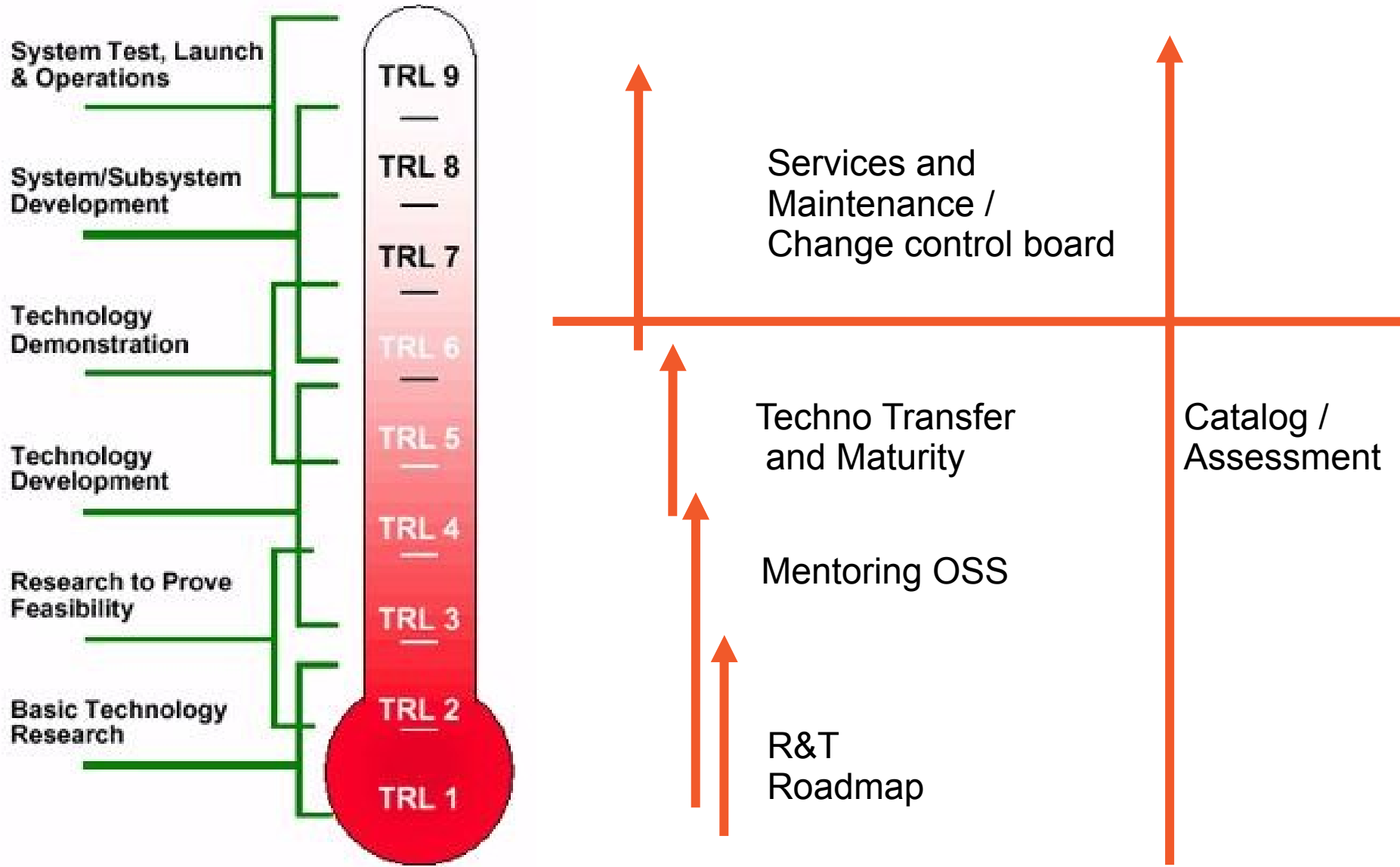 - Component test plan
  - ...

Polarsys Branding Process

- Structures the Providers eco-system
- Branding process identifies
    - Committed service providers
    - Skilled service providers
- Brand recognizes a proven expertise and investment in the technology
- Complements the OSS meritocracy
- *Only accessible to members*

Polarsys Project Planning Boards for OSS projects

- Project Planning Board
  - Drive the change process
  - Users prioritize new developments and fixes
  - Typically done with quarterly meetings
- Complements Project Management Committees
  - PMC are driven by developers and committers
- Balancing innovation and industrial quality

TRL & Polarsys

System Test, Launch & Operations

System/Subsystem Development

Technology Demonstration

Technology Development

Research to Prove Feasibility

Basic Technology Research

TRL 9
TRL 8
TRL 7
TRL 6
TRL 5
TRL 4
TRL 3
TRL 2
TRL 1

Services and Maintenance / Change control board

Techno Transfer and Maturity

Mentoring OSS

R&T Roadmap

Catalog / Assessment

Polarsys pillars

Open innovation

Maturity & Quality Assessment

Long term availability

For tools for the development of critical embedded systems

Join us!
http://www.polarsys.org