OPEN COMMUNITY EXPERIENCE

Open Innovation Unleashed:

Obeo's Journey in the Open-Source Ecosystem

Cédric Brun, CEO <cedric.brun@obeosoft.com>

Software reaches its best when shared openly and evolved by collaborative communities.
What if we could build a business aligned with this goals ?

Energy | Transportation | Space & Defense
Manufacturing | Healthcare | Financial | Government

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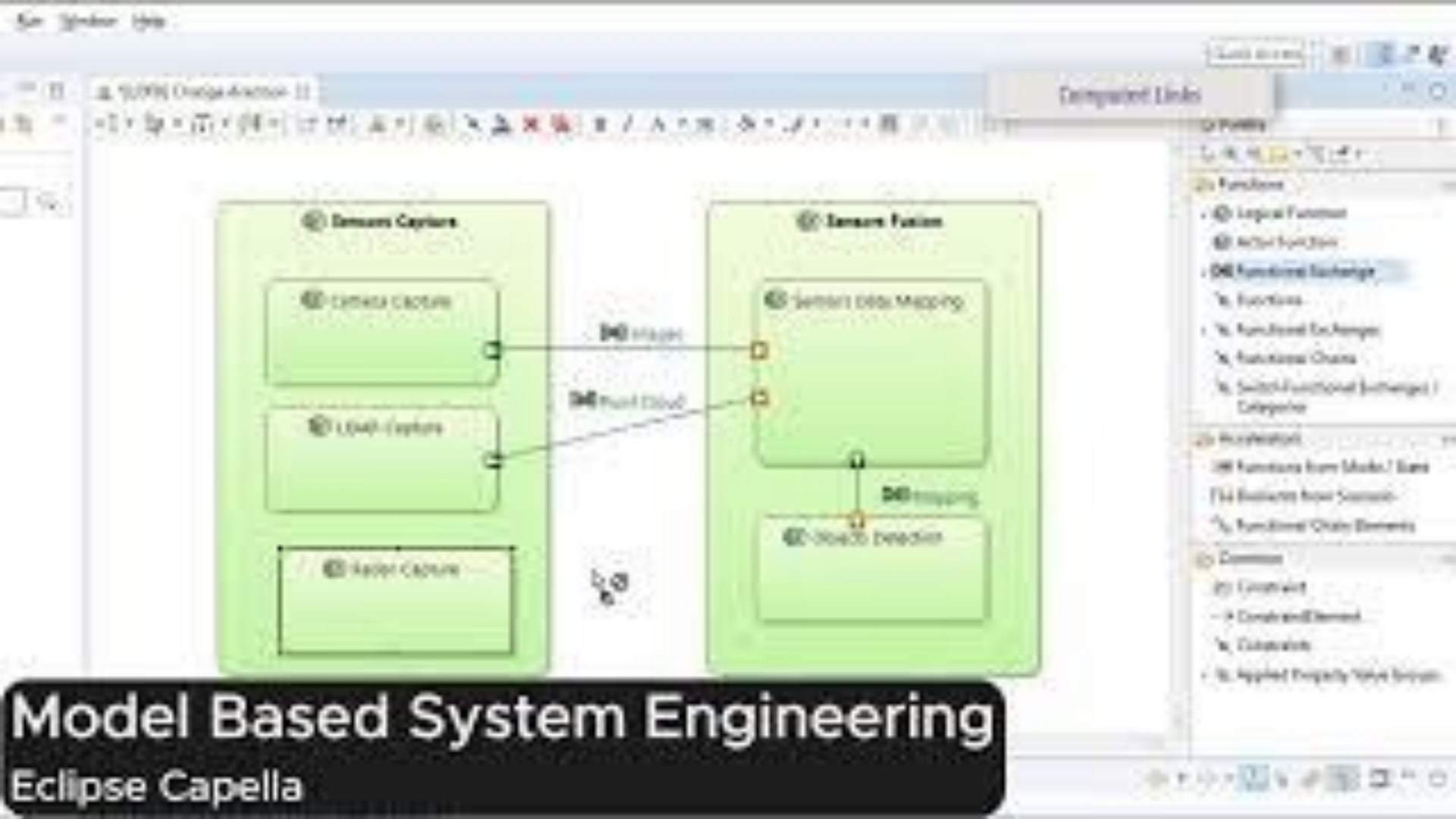
#WeAreObeo


Sensors Capture
Camera Capture
Lidar Capture
Radar Capture
Sensors Fusion
Sensors Data Mapping
Image
Point Cloud
Mapping
Model Based System Engineering
Eclipse Capella

Open Innovation | Millions Lines of Code Contributed in Open-Source

a **collaborative** approach where we, along with our customers and partners, work together—either directly within **open-source projects** or indirectly by adapting and extending these projects—

to develop innovative solutions tailored to their needs.

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The Journey

Early Days | Obeo's creation in 2005

Model Driven Company

«Creating products that make development more efficient by pragmatically harnessing the power of models to analyze, design, generate, or migrate code.»

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Getting to know the Eclipse Open-Source Community

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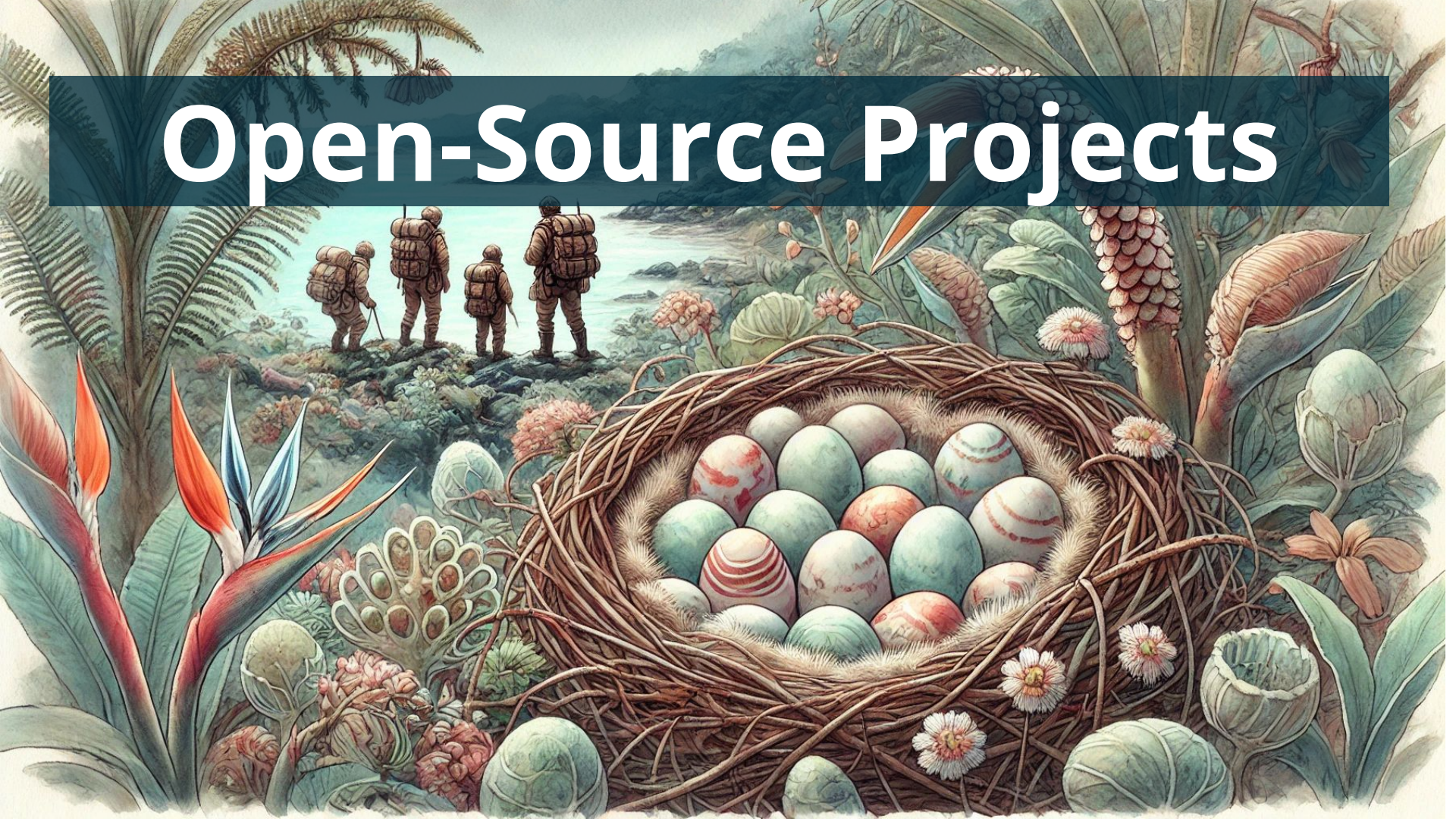
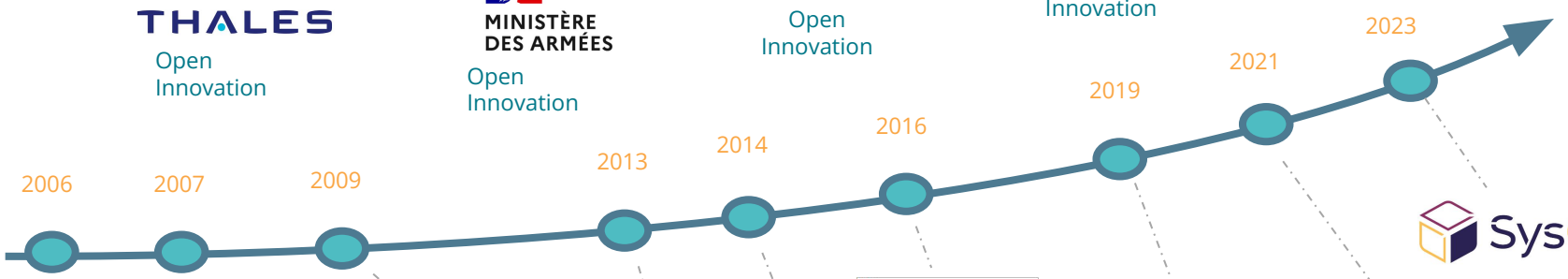
Open-Source Projects



Open Innovation | Millions Lines of Code Contributed in Open-Source



THALES
Open Innovation

MINISTÈRE DES ARMÉES
Open Innovation

ERICSSON
Open Innovation

TNO innovation for life
Open Innovation

cea list
Open Innovation

Acceleo
Code generation

EMF Compare
Model Comparison

INFORMATION SYSTEM Designer
IT Software Development

Document generation

Sirius WEB
Web Modeling

SysON
SysMLv2 Web Modeling

POOSL
Model Simulation (by TNO)

Graphical modeling

Domain definition

Systems Engineering (by Thales)

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Acceleo

- **Main challenge**
  - Our very first successful Open-Source project
  - An enabling technology: needs generation modules for specific technologies to be useful to the end user
  - Acceleo 3 : keep it pragmatic yet OMG standard compliant

- **History**
  - Started as a autonomous project
  - Joined ObjectWeb then later Eclipse Foundation
  - 3 major rewrites, the latest one currently undergoing

Official Modules

The official modules are stable and polished enough to be used for a project and setup in a software development cycle.

The target technologies are stable and well-known.

Name	Target	Metamodel	License
C# - NHibernate	.Net	UML 1.4	GPL V2.0
JEE Hibernate/Struts	Java/Hibernate	UML 2.1	EPL
Leonardi	GUI models	UML 2.1	GPL V2.0
Topcased Java module	Java	UML 2.1	EPL V1.0
UML 2.1 to Java module	Java	UML 2.1	EPL V1.0

```
[comment encoding = UTF-8 /]
[**
 * The documentation of the module generateBuilderAPI.
 * @author cedric
 * @version 1.0.0
 * @since 1.0.0
 */]

[module ecoreBuilderJavaAPI('http://www.eclipse.org/emf/2002/Ecore', 'http://www.eclipse.org/emf/20
[import fr::obeo::dsl::playground::genmodel::gen::emfbuilder::GenModelServices/]

[comment @main/]
[template public generateAPI(genModel : genmodel::GenModel)]

[for (genPackage | genModel.genPackages)]
[file (genPackage.folderPath() + 'builder/' + genPackage.builderFactoryName() + '.java', overwrite,
  package [genPackage.basePackage/].builder;

  public class [genPackage.builderFactoryName()/] {

[for (clazz | genPackage.genClasses->select(i | not(i.ecoreClass.abstract) and not(i.ecoreClass.int
    /**
      * Create a new builder for the type [clazz.name()/].
      * [clazz.documentation/]
      * @see [clazz.qualifiedInterfaceName()/]
      * @return the newly created builder for the type [clazz.name()/].
      */
      public [clazz.builderClassName()/] new[clazz.name()/]() {
          return new [clazz.builderClassName()/]();
      }
[/for]

  }
[/file]
[/for]
[for (genClass | genModel.genPackages.genClasses)]
    [file (genClass.genPackage.folderPath() + 'builder/'+ genClass.builderClassName() + '.java', ov
     [genClass.generateBuilderInterface()/]
    [/file]
[/for]

[/template]


[query public builderFactoryName(pak : genmodel::GenPackage) : String = pak.prefix + 'Builders'/]

[query public builderClassName(clazz : genmodel::GenClass) : String = clazz.name() + 'Builder'/]
```

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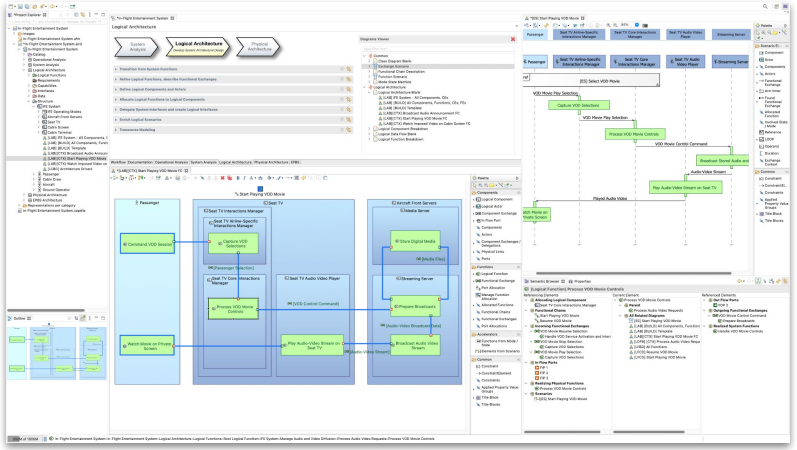
Bootstrap and long term relationship | Eclipse Sirius

THALES

- **Main challenge**
  - Develop a new MBSE tooling supporting ARCADIA method
  - Deploy the tool on mission-critical projects
  - Contribute in open-source and build an ecosystem for a worldwide adoption
- **Solution**
  - A long-term Open Innovation collaboration with aligned strategic goals
- **How ?**
  - Open-source projects: Eclipse Sirius, Capella, Python4Capella
  - Commercial add-ons: Team for Capella
  - Specific developments



«We have established a lasting relationship of trust in innovation»

Daniel Exertier

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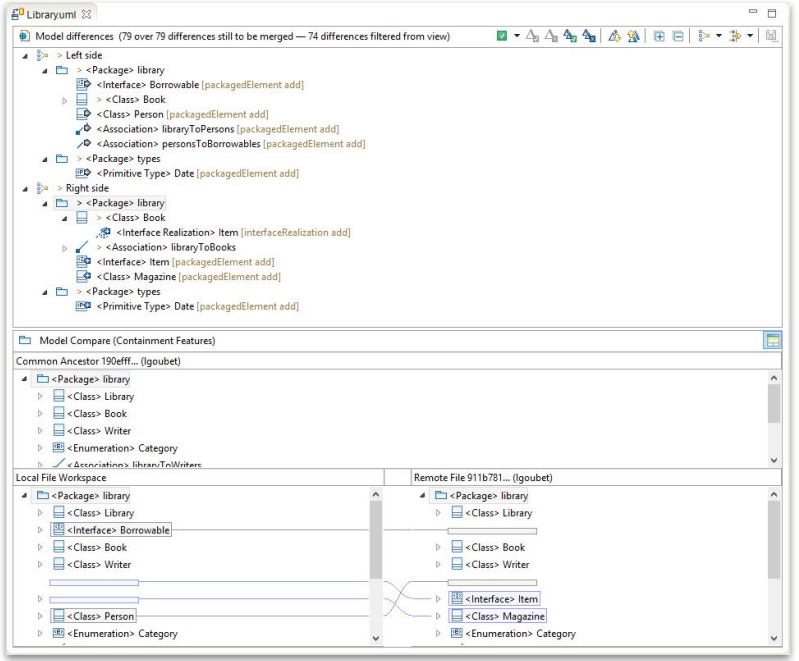
Sponsored work in an existing project | EMF Compare

ERICSSON

- **Main challenge**
  - Strong OSS alternative to commercial modeling products requires state-of-the art support for model comparison, merge, and VCS integration
- **Solution**
  - Develop EMF Compare 2.0 in Eclipse
    - Reliability for complex interdependent models
    - Speed and scalability
    - Graphical comparison
    - EGit Integration
- **How ?**
  - A set of development projects.
  - Research and innovation on model comparison
  - Implemented and evolved EMF Compare over the years
  -



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Multiple customers contributing to a common | M2doc

- **Main challenge**
  - to get Office compatible documents from the models
  - document has to conform to corporate templates
  - document has to integrate diagrams, tables…
- **Solution**
  - extends M2doc to add missing features
- **How ?**
  - Several distinct projects contributing to M2doc

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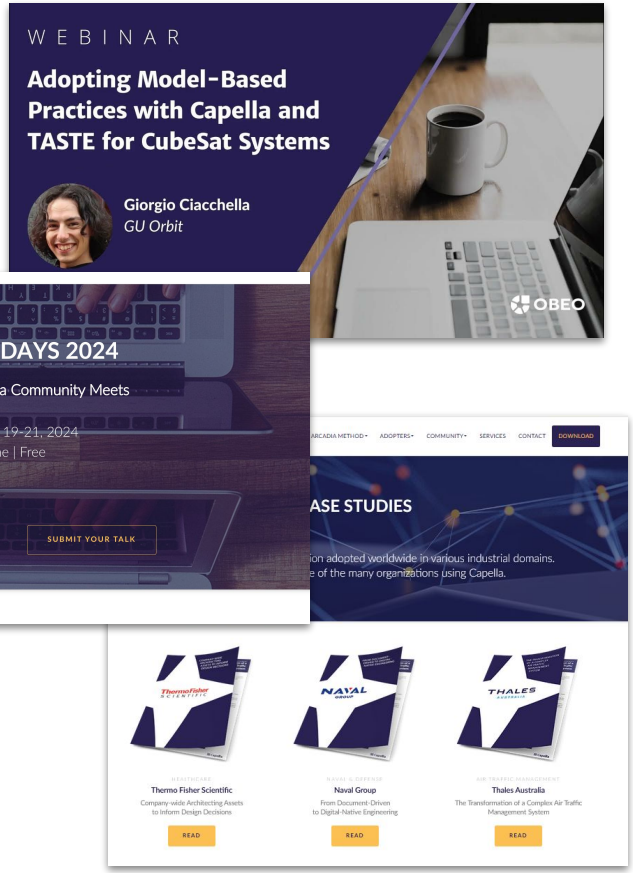
Community and Evangelization | Eclipse Capella

- **Main challenge**
  - Make Capella widely used in the industry
  - Publishing as OSS is not enough
  - Engineering practices are set for the long term
- **Solution**
  - Grow the user community
- **How ?**
  - Amplify the voice of the community
    - 10+ webinars a year
    - case studies
    - 1 major yearly event : Capella Days
    - on the fied events
    - and much more...
  - Nurture the emergence of an eco-system
    - Training, coaching and services
    - Add-ons



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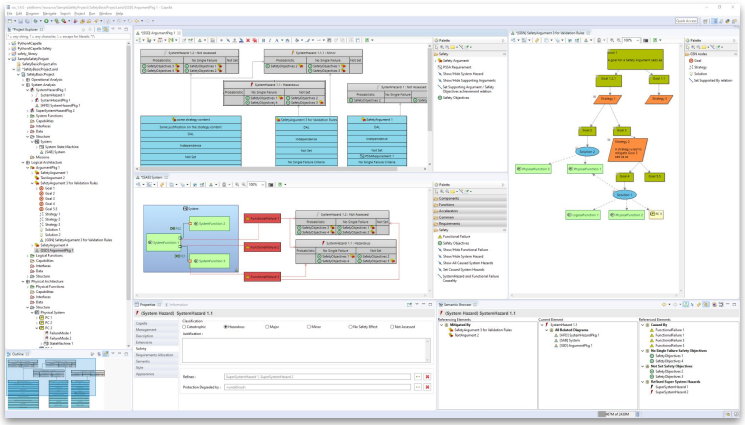
The “in-house” Add-on | Rolls Royce

- **Main challenge**
  - Industrializing a specific Safety add-on for Capella
  - Initially developed by Rolls-Royce as a prototype
  - Rolls-Royce needed a production-ready solution
- **Solution**
  - Development of a Capella extension
    - new diagrams for representing safety-related concepts
    - link between system hazards and design elements
    - model failure modes within the system design
- **How ?**
  - Development project with an agile approach: successive sprints to implement new features, with a usable result delivered regularly
  - Capability to develop unplanned features identified during the development
  - Directly work with the consultant who was leading the project



- https://blog.obeosoft.com/industrializing-a-capella-add-on-for-rolls-royce
- https://youtu.be/njW_zdE_FzI

«Our experience with Obeo was positive from start to finish»

Paul Thornton

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Business Model

Hybrid Business Model| Development Services + Add-ons and products

Development Services

- ✔ Custom Workbenches
- ✔ Development
- ✔ Open-Source Core Development
- ✔ Integration
- ✔ Add-on Development
- ✔ Support & Expertise
- ✔ Training

Commercial Software

- ✔ Add-ons to open-source products
  - Team and collaboration support
  - Enterprise features
  - Specific domains (Eco-Design…)
- ✔ Off the shelve product

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Open-source product + Commercial Add-ons = Open Core

POOSL

Sirius WEB

SysON

The open-source product is great in itself, the add-ons are providing additional level of services or features of interest to paying customers.

Obeo Designer

Team for Capella

Enterprise for POOSL

Publication for Capella

Cloud for Capella

Obeo Cloud Platform

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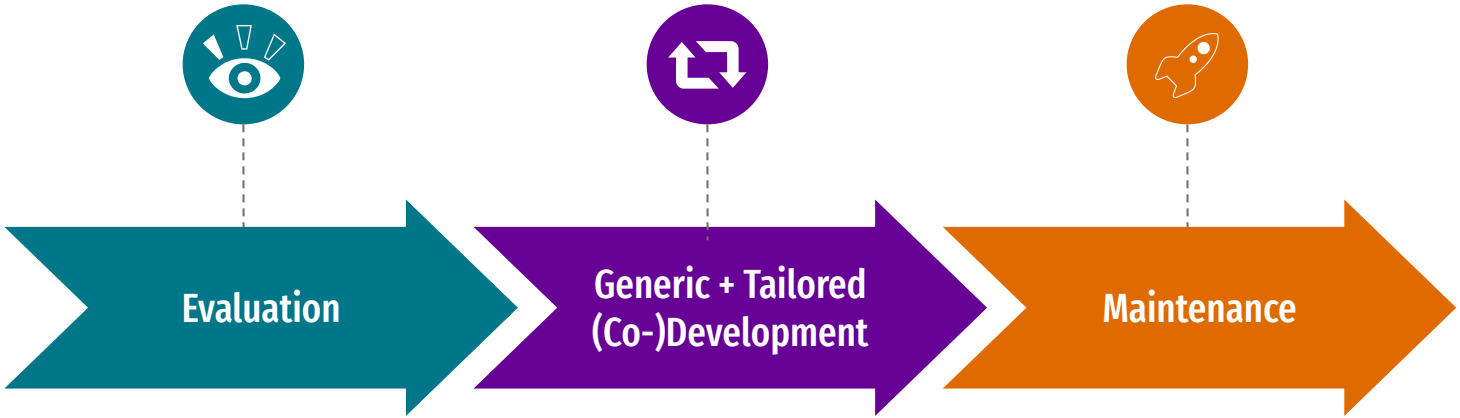
Open-source product + Projects + Commercial Add-ons



Bootstrap (5-15 days)

- Discover the technologies
- Co-create a demonstrator
- Evaluate the gap to your needs
- Co-define a roadmap

Iterative sprints (2 weeks)

- Specification
- Development
- Integration
- Feedback

Subscription (yearly)

- Generic (Software Assurance)
- Specific (Maintenance Agreement)

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Collective Advantages | Positive Feedback Loop

An expert partner to support his projects
Needed features, integrated and **maintained upstream**
Mitigate vendor lock-in

Long term availability of the technology
A supportive environment for industrial collaboration and co-investment

A stream of paid effort supporting the project activities
Larger adoption footprint

Get te project + addons providing business added value

Trained candidates

Able to learn using the same software as the industry

Easier access to education, academia, and experimentation

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It’s all about balance | Overview

Follow governance rules

Support community growth

Engage with the community

Develop expertise

Earn trust

Balance paid and unpaid efforts

Contribute down your stack

Add-On must Follow community rules and work seamlessly within the ecosystem

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Research and Academia | Collaboration and Innovation

Academia ❤️ Open Source: Our OSS projects are widely used in academic and research environments, with academics pushing the boundaries of our technologies and advocating for them globally.

Collaborative Projects 🚧: We actively contribute to projects through expertise, sub-contracting, or as full partners.

Funding and Innovation 💰: A leverage for SMEs like us to explore new areas, reduce risks, and deliver faster, more relevant outcomes by building on established open-source projects.

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Alignment of Goals| Hybrid Business Model

Development Services

- ✔ Custom Workbenches
- ✔ Development
- ✔ Open-Source Core Development
- ✔ Integration
- ✔ Add-on Development
- ✔ Support & Expertise
- ✔ Training

Staying in contact with users' needs and funding some of the developments

Commercial Software

- ✔ Add-ons to open-source products
  - Team and collaboration support
  - Enterprise features
  - Specific domains (Eco-Design…)

To sell add-ons effectively, we must first ensure our products are widely adopted.

- ✔ Off the shelve product

This diversifies our revenue streams and allows us to step into our users' shoes.

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Is that so easy ? | Actually, no

We are in a specialized niche, and many initiatives didn't work as expected. While projects were created, sometime interest didn't grow enough to expand them.

Open Source Interest ≠ Business Viability : Adoption is necessary, but it's not enough to guarantee a sustainable business.

Your commercial product(s) must:

- Solve a painful problem that users (willing to pay) need fixed.
- Be difficult to substitute or replicate.

you also must excel in communication, marketing, and distribution...

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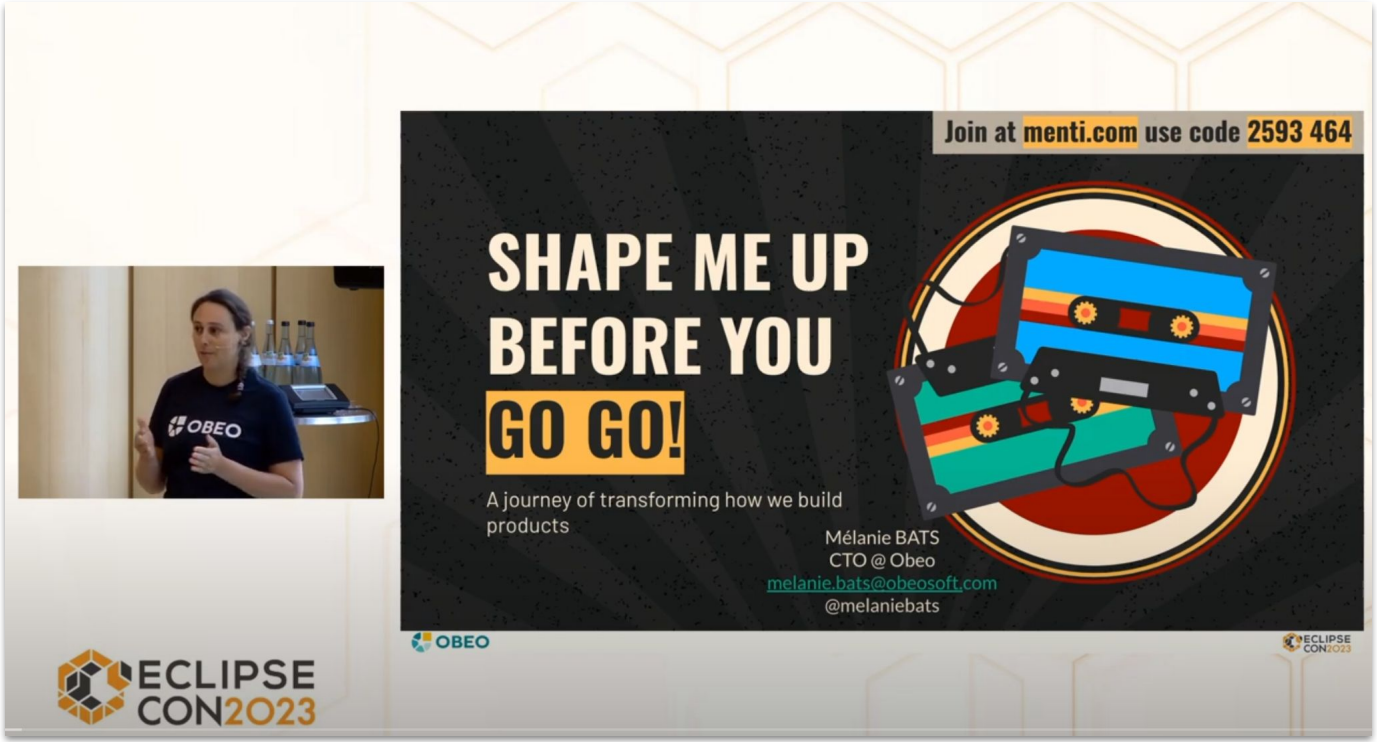
The “Project”, the “Product” | Transforming our organization



https://www.youtube.com/watch?v=jWjfDKof_vs

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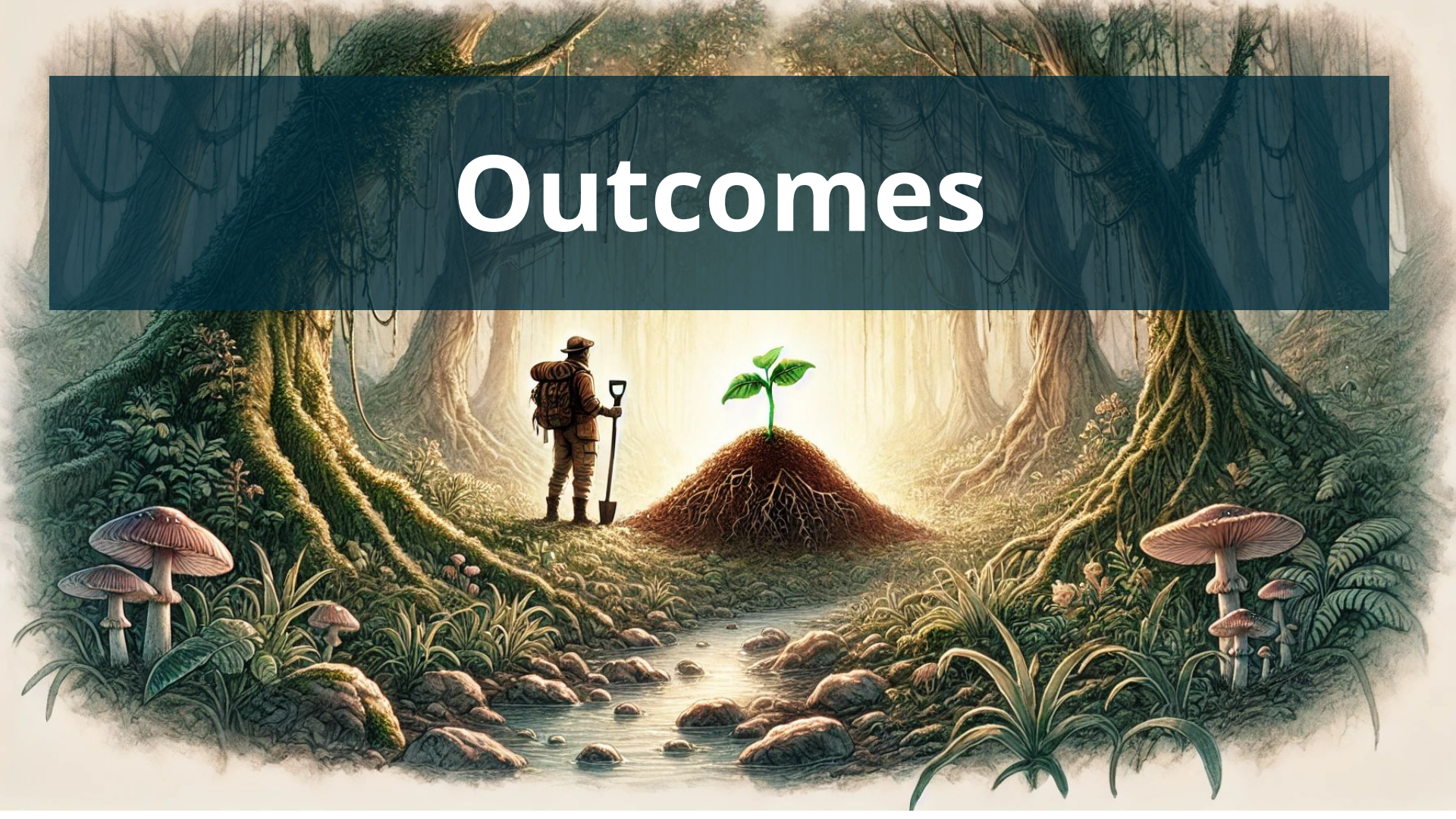
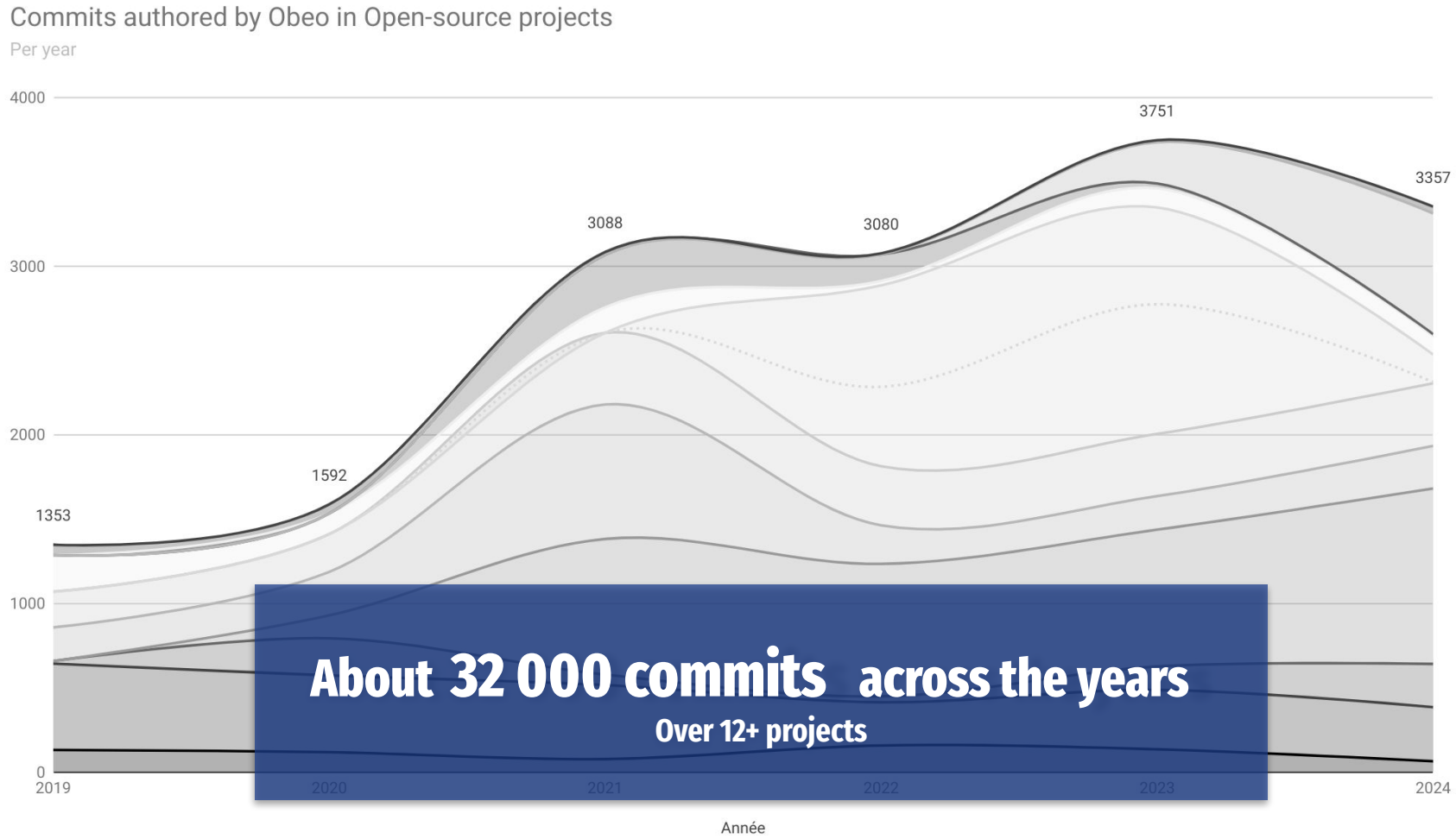
Outcomes





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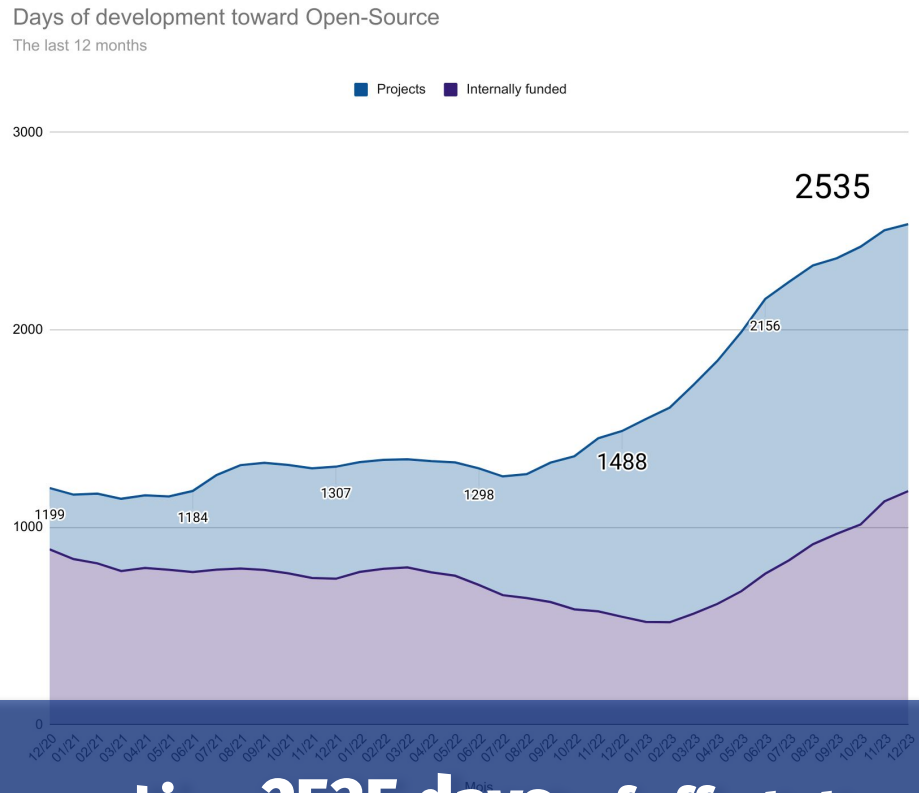

New record in : 2535 days of efforts toward OSS

by Obeo or through customer projects

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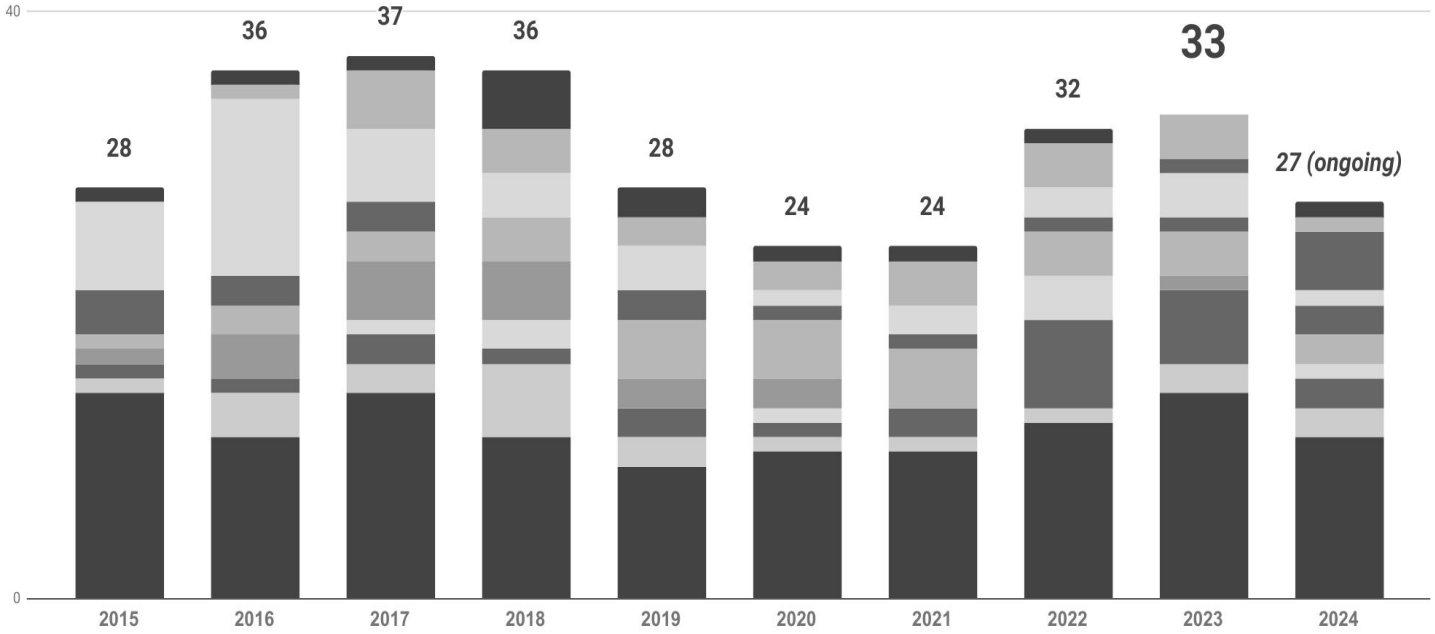

+350 open-source releases over 15 years

(only from projects Obeo is leading)

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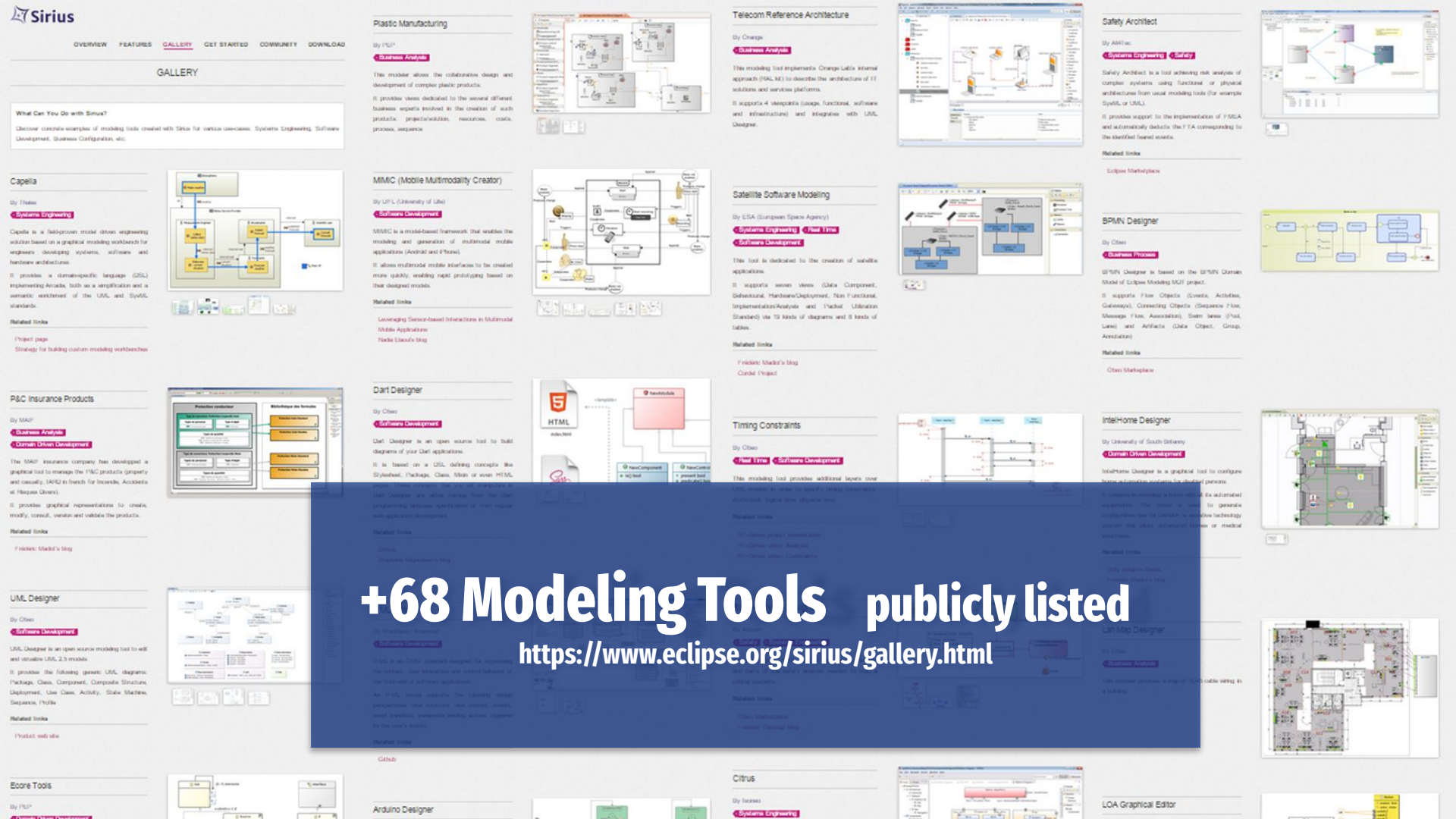
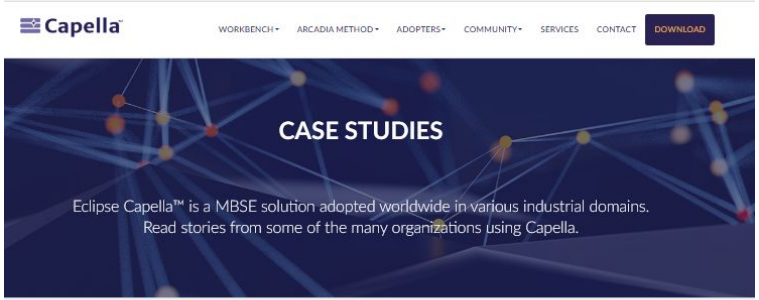

Sirius
OVERVIEW FEATURES GALLERY GET STARTED COMMUNITY DOWNLOAD
GALLERY
What Can You Do with Sirius?
Discover concrete examples of modeling tools created with Sirius for various use-cases: Systems Engineering, Software Development, Business Configuration, etc.
Capella
Systems Engineering
Capella is a field-proven model driven engineering solution based on a graphical modeling workbench for engineers developing systems, software and hardware architectures.
P&C Insurance Products
Business Analysis
Domain Driven Development
UML Designer
Software Development
Ecore Tools
Plastic Manufacturing
Business Analysis
Dart Designer
Software Development
MIMIC (Mobile Multimodality Creator)
Software Development
Arduino Designer
Telecom Reference Architecture
Business Analysis
Satellite Software Modeling
Systems Engineering
Real Time
Software Development
Timing Constraints
Real Time
Software Development
Citrus
Systems Engineering
Safety Architect
Systems Engineering
Safety
BPMN Designer
Business Process
IntelHome Designer
Domain Driven Development
LOA Graphical Editor
+68 Modeling Tools publicly listed
https://www.eclipse.org/sirius/gallery.html

+1750 mentions in Research Papers
from 2008 to 2024



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Thermo Fisher Scientific
Company-wide Architecting Assets to Inform Design Decisions
READ

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Naval Group
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READ

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Thales Australia
The Transformation of a Complex Air Traffic Management System
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RAILWAY
Digitale Schiene Deutschland
Model-centric Engineering Environment to Design the Future Railway System
READ

ENERGY
UK Atomic Energy Authority
Conceptual Design of the STEP Fusion Power Plant
READ

AVIATION
Rolls Royce
Arcadia and Capella for a large complex mechanical system
READ
Chinese Version

1000+ organizations are using Eclipse Capella worlwide

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Pioneering Web-Based Modeling Tools

A platform for web based modeling

The Challenge :

- Addressing the Development Effort
- Engaging the Desktop Community
- Convincing It's Achievable

The reward in sight :

Seamless onboarding in tools, better user experience, efficient collaboration among users and among softwares

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Bootstraping| Sirius Web Initiative

Several internal initiatives from 2012, our goal was to strike **the right balance** in term of sharing existing technologies, opening to new one where it matters.

2019 : clearer roadmap and ramping up effort to achieve a MVP

2021 : we make this work OSS - start with working code!
2022 : keep working, keep showing...

Sirius WEB

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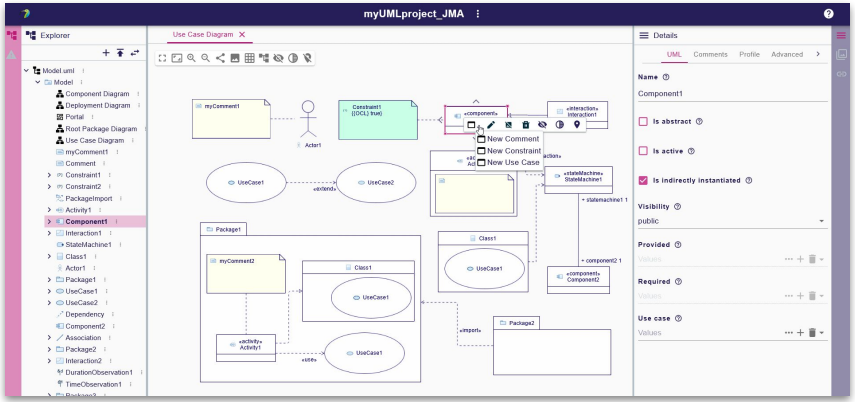
Bootstrap and long term relationship

- **Main challenge**
  - Modernize **Papyrus** and ease the maintenance
  - Get a partner able to support such deployments
  - Get ready for experimenting and contributing to the next generation of modeling tools:
    - Augmented Engineering
    - Digital Thread
    - Secured collaboration at scale
    - Green Tech
  - a brand new standard : SysML v2
- **Solution**
  - a multi-level collaboration : technological, research and strategic to work toward a shared vision.
- **How ?**
  - Development projects to migrate UML editors to Sirius Desktop and Sirius Web
  - Contributes on Sirius Web
  - Work together on a new project for SysMLv2 : SysON



- https://blog.obeosoft.com/sirius-papyrus-web-a-new-era-for-collaborative-engineering-tools
- https://www.youtube.com/watch?v=18MuxEVm6y0
- https://www.youtube.com/watch?v=GcRFW0YfFEI

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SysMLv2| The SysON project

SysML v2 is a significant improvement to SysML v1 and a very promising piece of technology:

- Better **Interoperability**
- Enabler for **formal verification** and AI interactions
- Foundation for building libraries of **domain specific ontologies**
- **Foundation** for supporting MBSE processes

Viewing or authoring a SysML v2 model should be easily available to every Systems Engineers and beyond.

SysON

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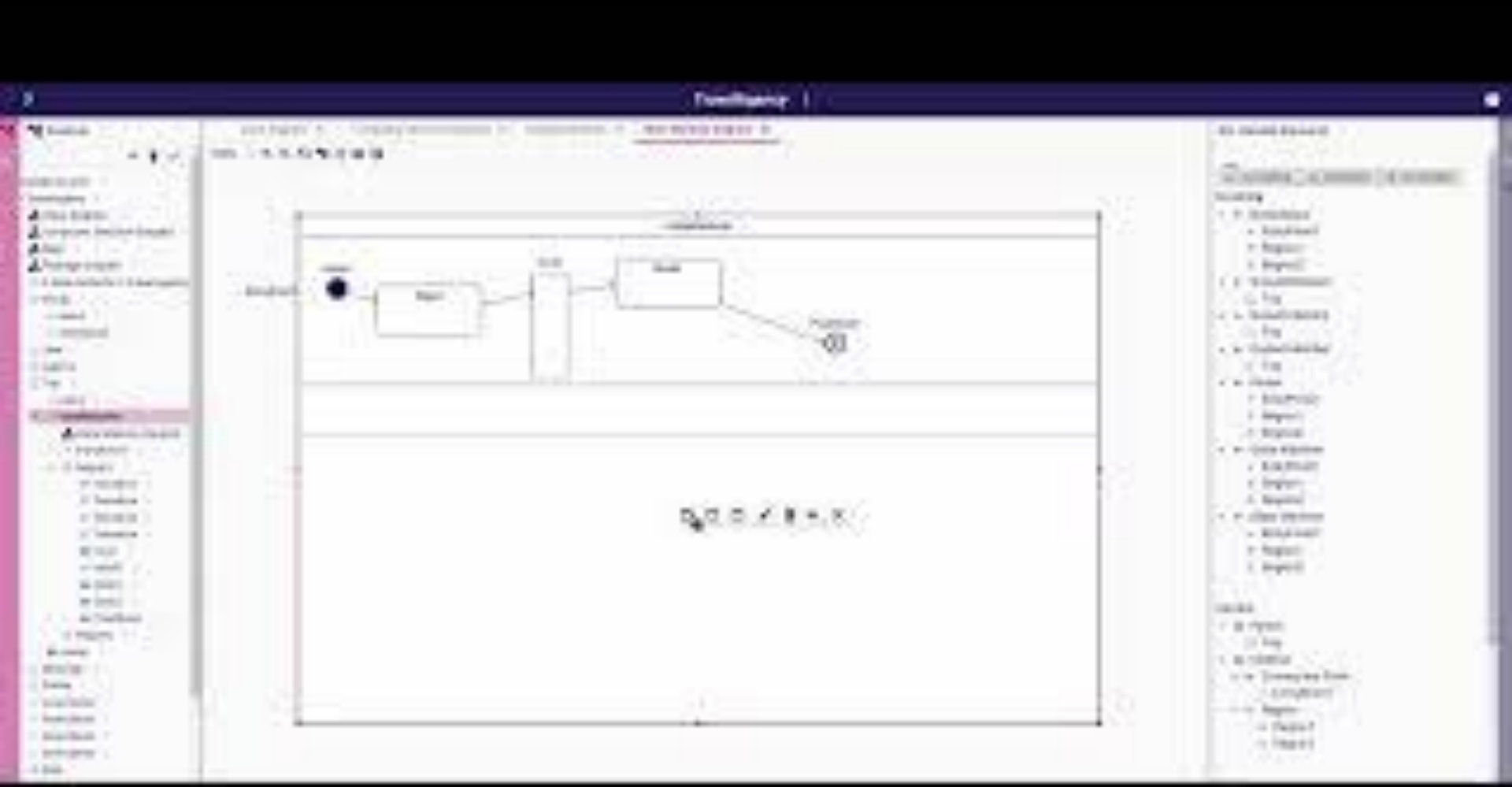

Software reaches its best when shared openly and evolved by collaborative communities.

Continuous Improvement and Wide Adoption

Reinvesting in Innovation

Collaborative Partnerships

We started a new chapter with Sirius Web and Eclipse SysON for SysMLv2.

Let's shape the future—collaboratively!

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Thank you

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