



OPEN COMMUNITY
EXPERIENCE

Open Innovation Unleashed: Obeo's Journey in the Open-Source Ecosystem

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

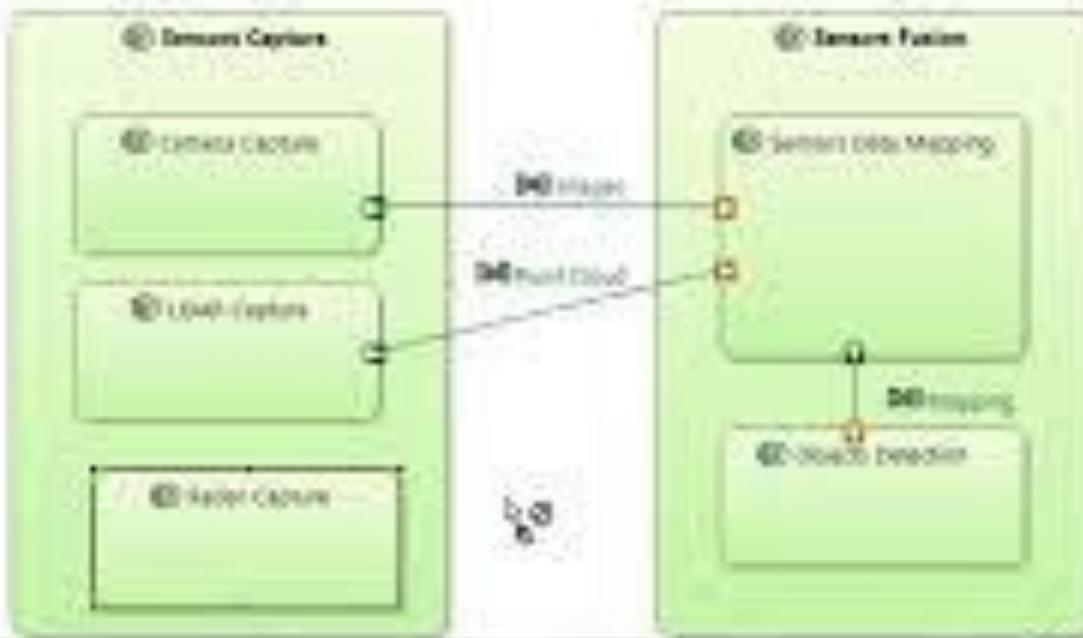


Software reaches its best when shared openly and evolved by collaborative communities.

What if we could build a business aligned with this goals ?



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



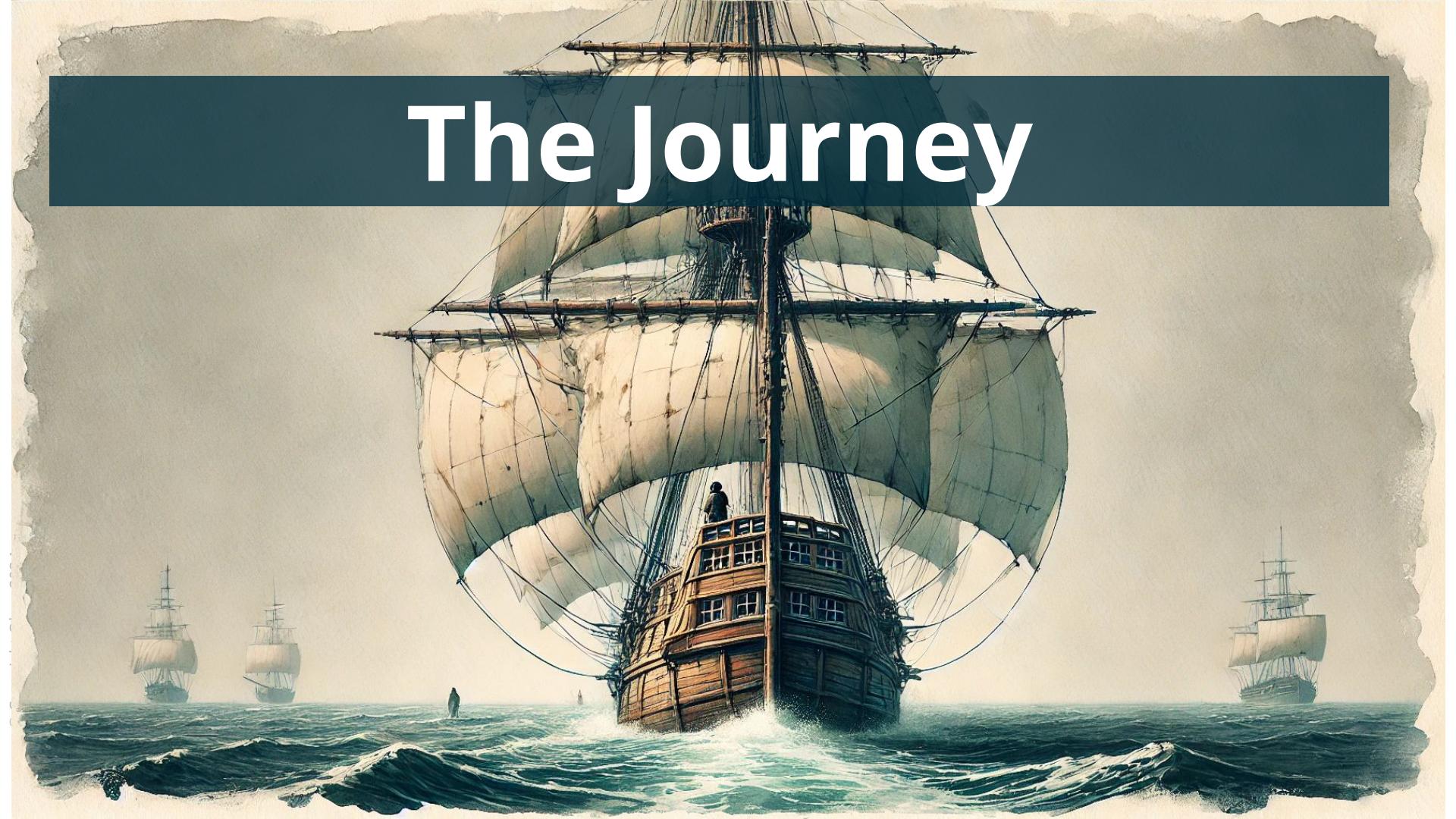
Model Based System Engineering

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.

The Journey



Early Days | Obeo's creation in 2005



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

Getting to know the Eclipse Open-Source Community

Eclipse Community

These forums are your way of communicating with the tools hosted at Eclipse.org. Please stick to technical public forums!

All contributions you make to our web site are governed by Foundation web properties and any information you provide is subject to our [Community Policy](#).

Show: Today's Messages :: Unanswered Messages ::

Forum

Newcomers - General Newcomer discussions

-  [Newcomers](#)
Eclipse forum for newcomers

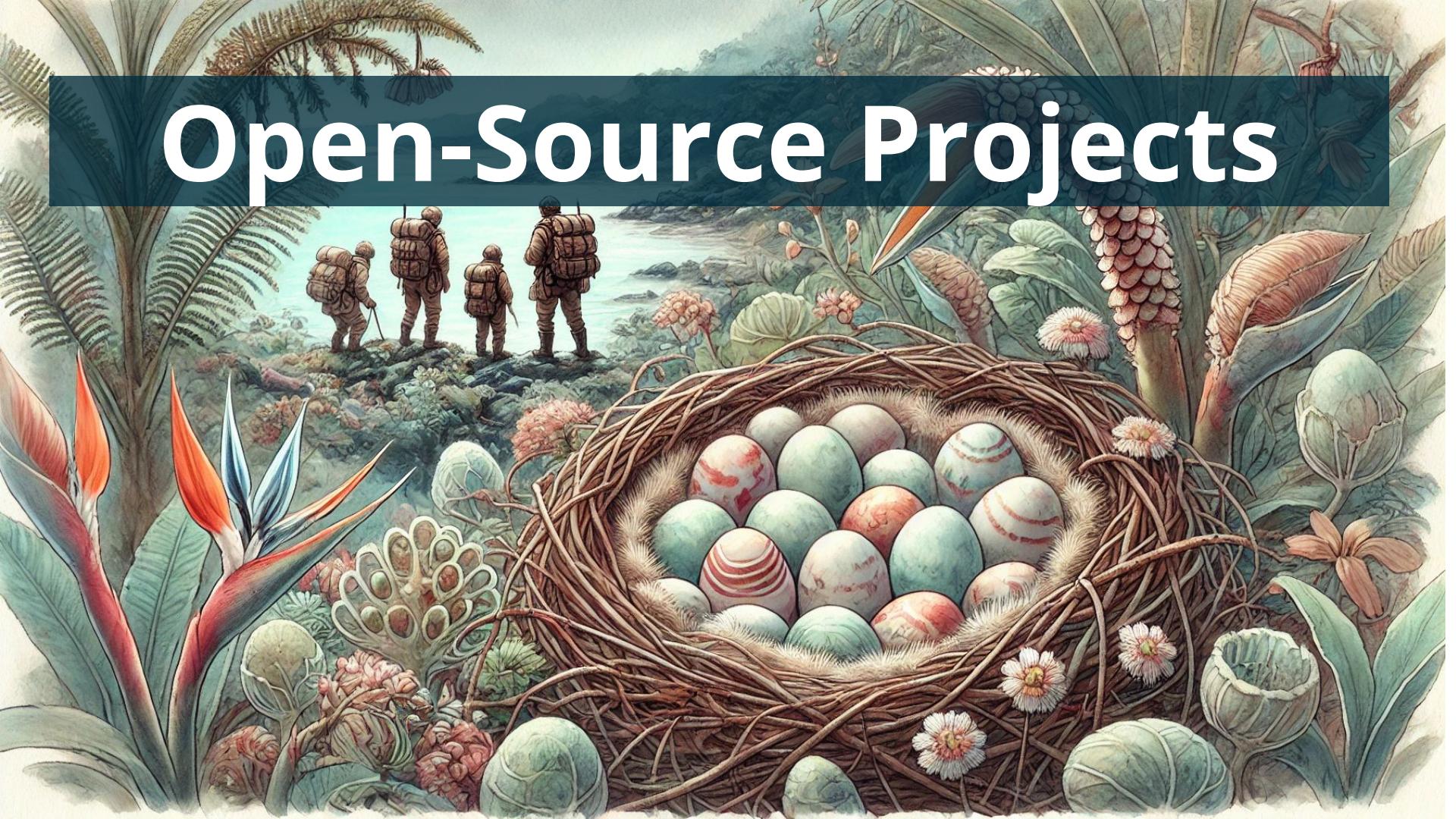
Language IDEs - IDEs and tools for specific projects

Modeling - Modeling tools and technologies -

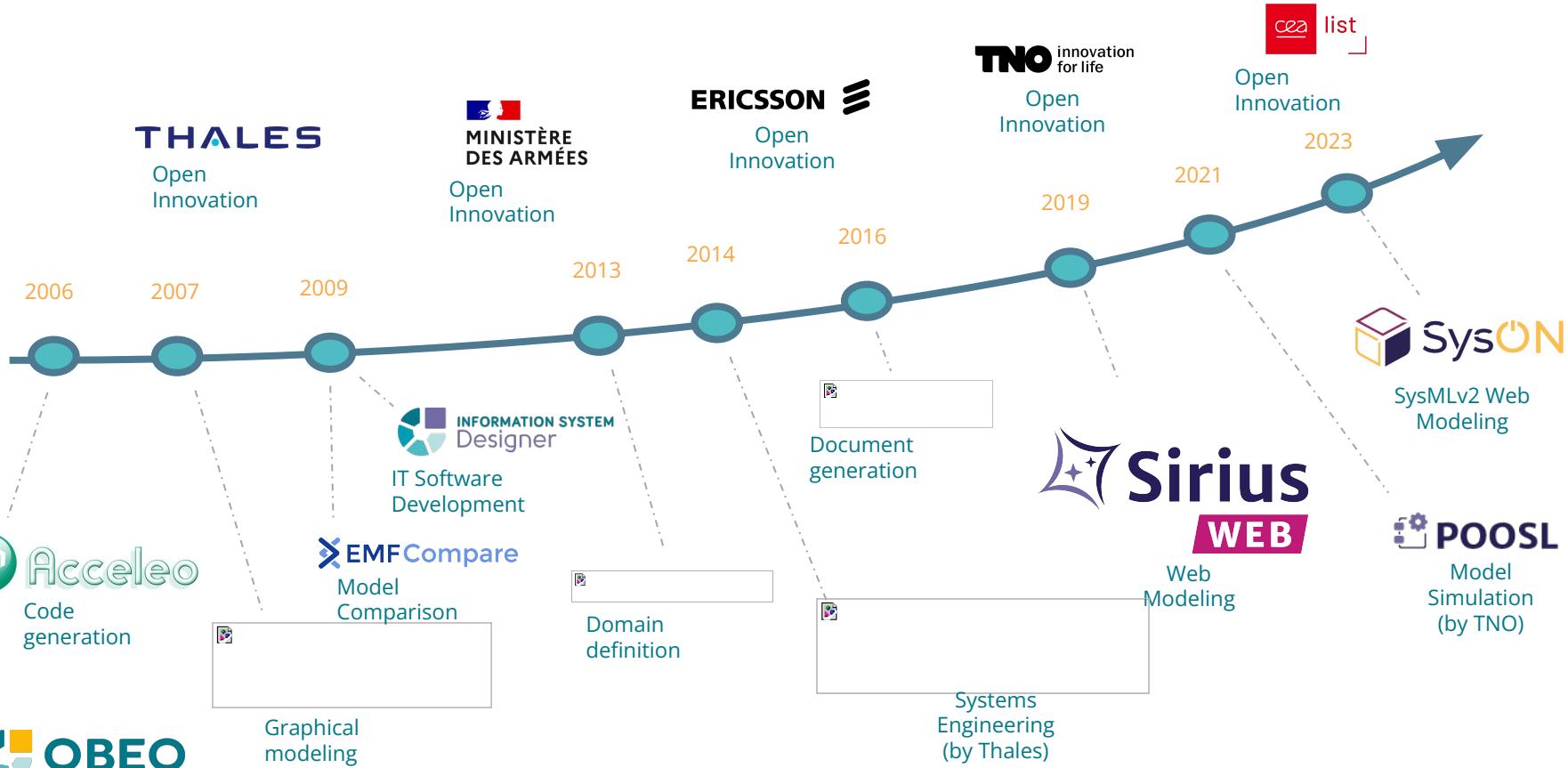
-  [Amalgam](#)
Amalgamation Group
-  [ATL](#)
ATL discussions
-  [Compare](#)
EMF Newsgroup [project home]
-  [Ecore Tools](#)
EMFT Forum [project home]
-  [EMF](#)
Eclipse Modeling Framework (Core) [project home]
-  [EMF "Technology" \(Ecore Tools, EMFT\)](#)
EMFT Newsgroup [project home]



Open-Source Projects



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





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
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/2002/GenModel')
 [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'/]
```

Bootstrap and long term relationship | Eclipse Sirius

THALES

• Main challenge

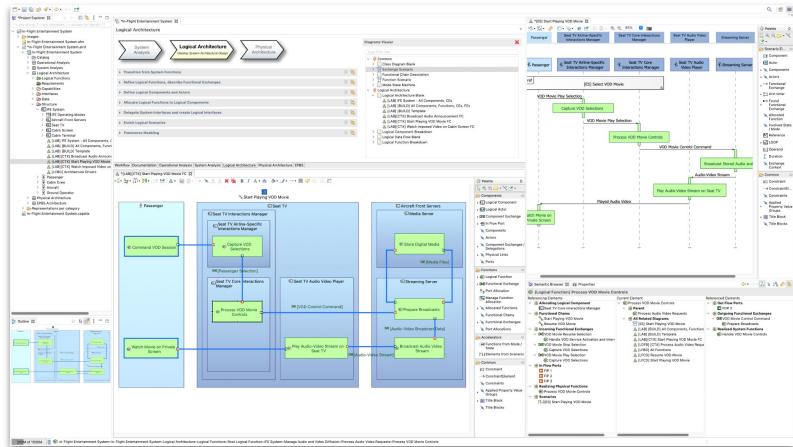
- Develop a new MBSE tooling supporting ARCADIA method
- Deploy the tool on mission-critical projects
- Contribute in open-source and build an ecosystem for a worldwide adoption

• 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



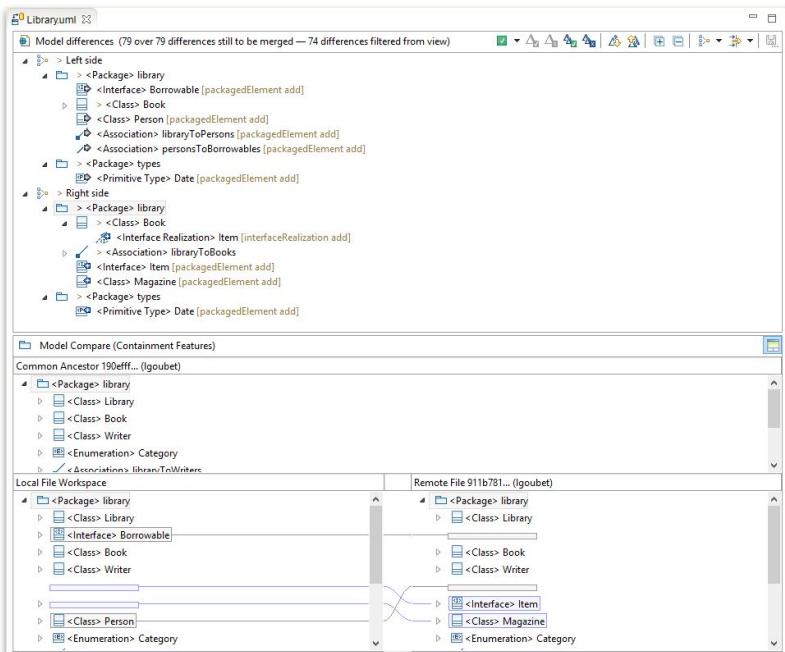
«We have established a lasting relationship of trust in innovation»

Daniel Exertier

Sponsored work in an existing project | EMF Compare



- **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
 -



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



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

The collage includes:

- A top right image showing a person working at a desk with a laptop, a cup of coffee, and a keyboard, with the OBE logo visible.
- A top left image for a webinar titled "Adopting Model-Based Practices with Capella and TASTE for CubeSat Systems" featuring Giorgio Ciacchella from GU Orbit.
- A central image for "CAPELLA DAYS 2024" showing hands typing on a laptop keyboard with the text "Where the Capella Community Meets" and "November 19-21, 2024 Online | Free". It includes "SAVE YOUR SPOT" and "SUBMIT YOUR TALK" buttons.
- A bottom section titled "CASE STUDIES" showing network diagrams and text about organizations adopting Capella worldwide.
- A bottom row of three case study cards:
 - Thermo Fisher Scientific**: Company-wide Architecting Assets to Inform Design Decisions. [READ](#)
 - Naval Group**: From Document-Driven to Digital-Native Engineering. [READ](#)
 - Thales Australia**: The Transformation of a Complex Air Traffic Management System. [READ](#)

The “in-house” Add-on | Rolls Royce

- **Main challenge**

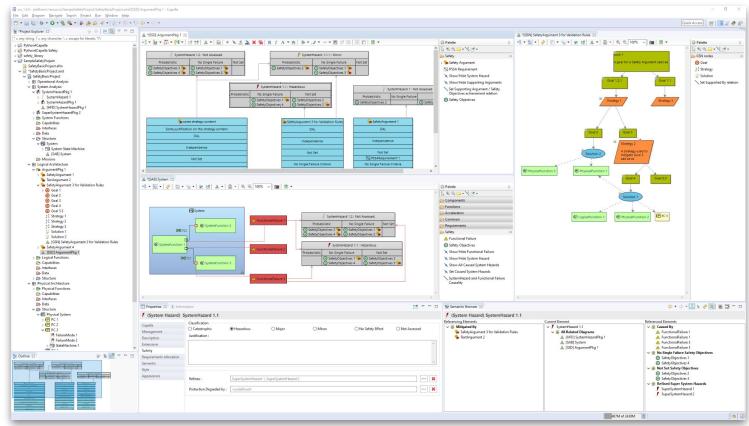
- Industrializing a specific Safety add-on for Capella
- Initially developed by Rolls-Royce as a prototype
- Rolls-Royce needed a production-ready solution

- **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_Fzl

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

Paul Thornton

Business Model



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



Development Services

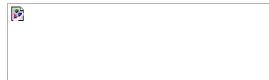
- ✓ Custom Workbenches
- ✓ Development
- ✓ Open-Source Core Development
- ✓ Integration
- ✓ Add-on Development
- ✓ Support & Expertise
- ✓ Training



Commercial Software

- ✓ Add-ons to open-source products
 - Team and collaboration support
 - Enterprise features
 - Specific domains (Eco-Design...)
- ✓ Off the shelf product

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



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

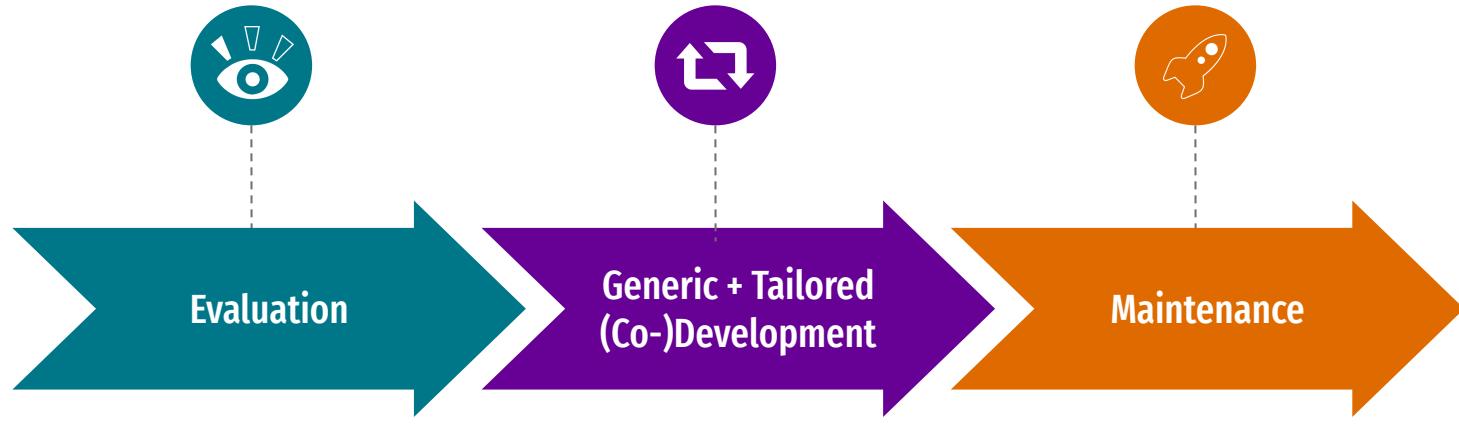
Enterprise
for POOSL

Publication
for Capella

Cloud
for Capella

Obeo
Cloud Platform

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)

Collective Advantages | Positive Feedback Loop

An expert partner to support his projects

Needed features, integrated and **maintained upstream**

Mitigate vendor lock-in

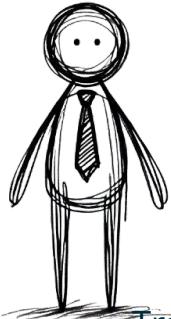


Long term availability of the technology
A supportive environment for industrial collaboration and co-investment



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

Get the 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

It's all about balance | Overview

Engage with the community

Follow governance rules

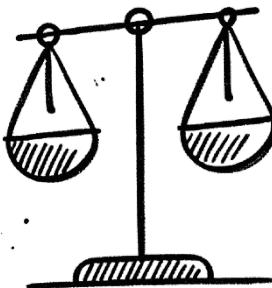
Earn trust

Contribute down your stack

Support community growth

Develop expertise

Balance paid and unpaid efforts



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

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.



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 shelf product

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

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...

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

A composite image featuring a woman in an Obeo t-shirt speaking at a podium on the left, and a presentation slide on the right.

**SHAPE ME UP
BEFORE YOU
GO GO!**

A journey of transforming how we build products

Mélanie BATS
CTO @ Obeo
melanie.bats@obeosoft.com
@melaniebats

ECLIPSE CON2023

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

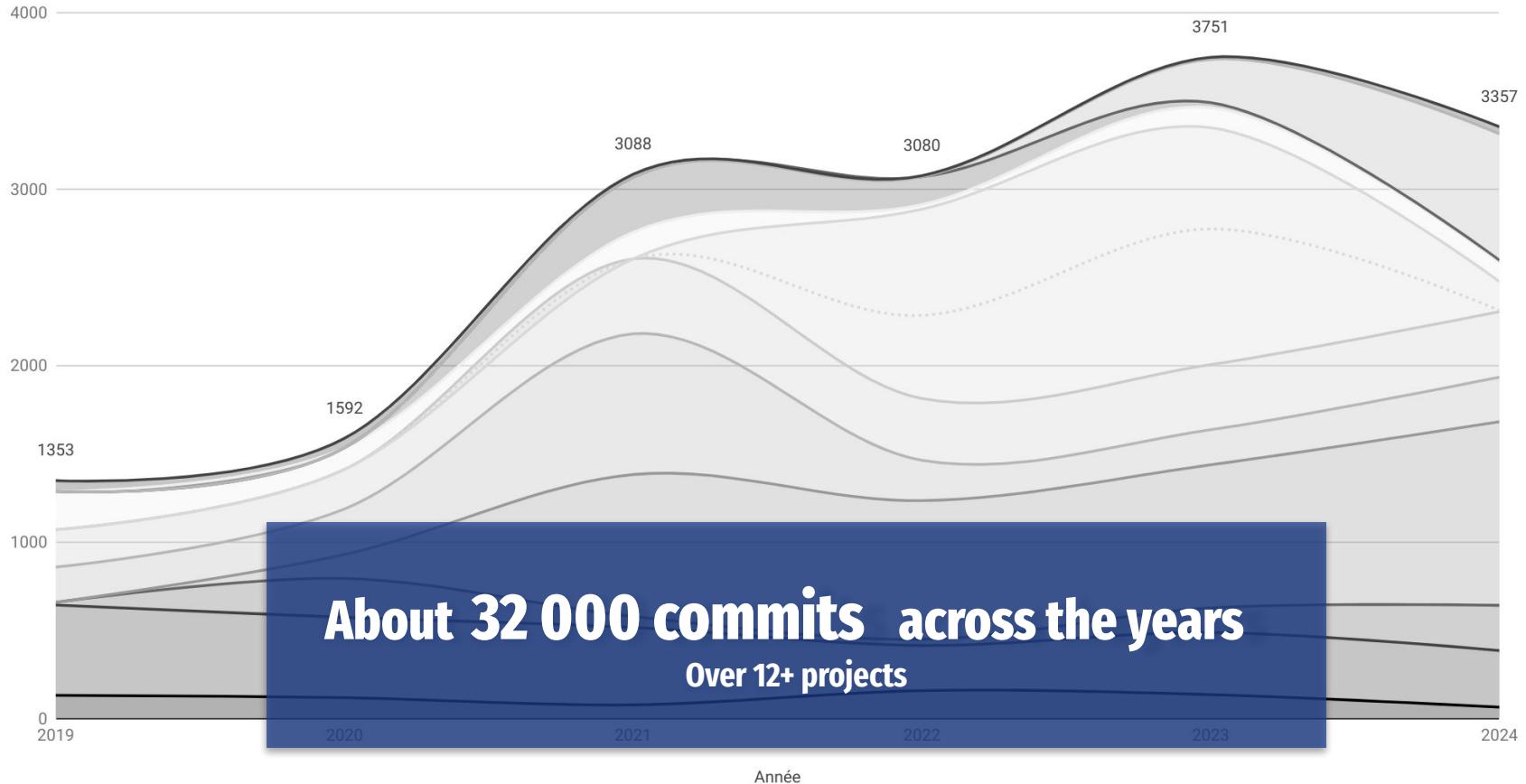


Outcomes



Commits authored by Obeo in Open-source projects

Per year



Days of development toward Open-Source

The last 12 months

Projects Internally funded

3000

2535

2000

2156

1000

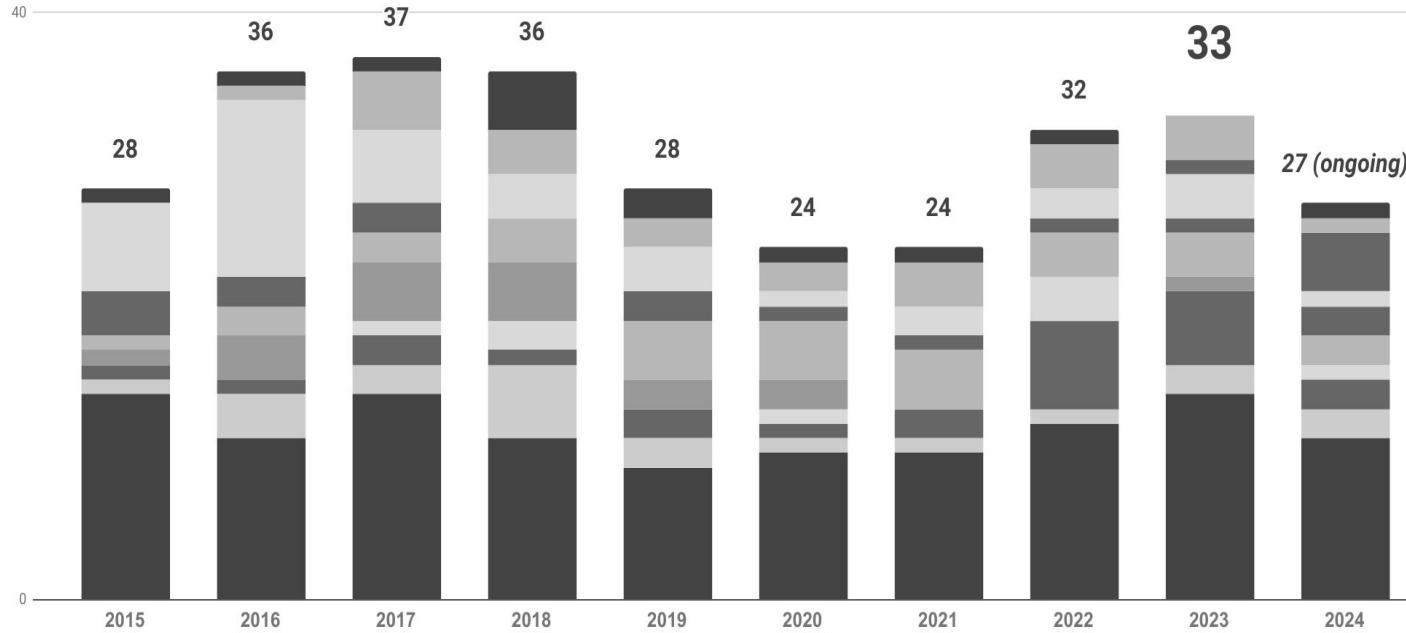
1307

1298

1488

0

New record in: **2535 days** of efforts toward OSS
by Obeo or through customer projects



+350 open-source releases over 15 years
(only from projects Obeo is leading)

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

By Thales

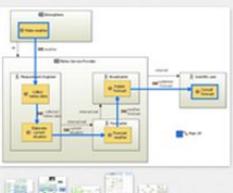
Capella is a UML-based model-driven engineering solution based on a graphical modeling workspace for engineers developing systems, software and hardware architectures.

It provides a domain-specific language (DSL) implementing Arcane, both as a simplification and a semantic extension, of the UML and SysML standards.

Related links

Project page

Strategy for building custom modeling workbenches



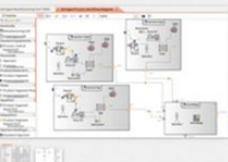
Plastic Manufacturing

By IBM

Business Analysis

This module allows the collaborative design and development of complex plastic products.

It provides views dedicated to the several different business experts involved in the creation of such products: project/iterations, resources, costs, process, sequence.



Telecom Reference Architecture

By Orange

Business Analysis

This modeling tool implements Orange's internal approach (P4ML-M) to describe the architecture of IT solutions and service platforms.

It supports 4 viewpoints (usage, functional, software and infrastructure) and integrates with UML Designer.



Safety Architect

By Alstec

System Engineering & Safety

Safety Architect is a tool achieving risk analysis of complex systems using functional or physical architectures from usual modeling tools (for example SysML or UML).

It provides support to the implementation of FMEA and automatically deduce the FTA corresponding to the identified failure events.

Related links

Eclipse Marketplace



BPMN Designer

By Cetis

Business Process

BPMN Designer is based on the BPMN Domain Model of Eclipse Modeling M2T project.

It supports Flow Objects (Events, Activities, Gateways), Connector Objects (Sequence Flows, Message Flows, Assemblies), Start Events (Flat, Loop) and Artifacts (Data Object, Group, Association).

Related links

Other Marketplace



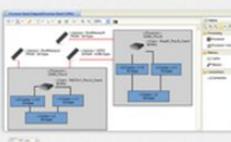
Satellite Software Modeling

By ESA (European Space Agency)

System Engineering & Real Time

This tool is dedicated to the creation of satellite applications.

It supports seven views (Data Component, Behavioural, Maintenance/Deployment, Non Functional, Implementation/Analysis and Parallel Operations Standard) via 19 kinds of diagrams and 8 kinds of tables.



Related links

François Meleix's blog
Codelab Project

IntelliHome Designer

By University of South Denmark

Domotic System Development

IntelliHome Designer is a graphical tool to configure home automation solutions for disabled persons.

It is based on a workflow methodology to automated requirements, the interface is used to generate configuration files for controllers, a mobile technology system, local photo, automated houses or medical structures.

Related links

Willy Adelborg's thesis
Felix Hennings' blog



Dart Designer

By Cetis

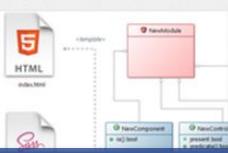
Software Development

Dart Designer is an open source tool to build diagrams of your Dart applications.

It is based on a UML defining concepts like StatelessWidget, Package, Class, Method or even HTML pages. Thus, once you have completed an Dart Designer, you can convert them into programming language specifications or from regular web application development.

Related links

CETIS
DartDesigner's blog



Timing Constraints

By Cetis

Real Time & Software Development

This modeling tool provides additional layers over UML, mainly in order to specify timing constraints, intervals, tasks and other periodicities.

Related links

UML-timer project presentation
UML-timer video Analysis
UML-timer video Comparison



+68 Modeling Tools publicly listed

<https://www.eclipse.org/sirius/gallery.html>

Arduino Designer

GitHub

Citrus

By Orange

System Engineering

Citrus is a tool for the design of complex systems in a graphical way. It is based on the UML profile Citrus.



LOA Graphical Editor

By Cetis

System Engineering

This module provides a map of network cable wiring in a building.





+1750 mentions in Research
Papers

from 2008 to 2024

The background of the slide is a classical-style painting depicting a three-masted sailing ship on the left, moving towards a large, multi-tiered wooden lighthouse on a rocky pier. The lighthouse has a bright light emanating from its lantern room. The scene is set against a backdrop of misty mountains and a rising or setting sun. The overall atmosphere is one of exploration and maritime history.

Pioneering Web-Based Modeling Tools

A platform for web based modeling

The Challenge :

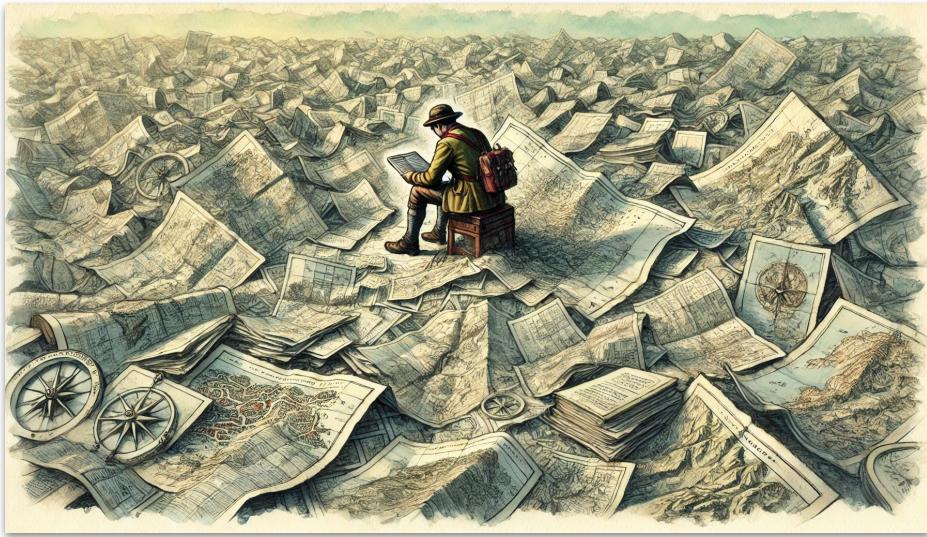
- Addressing the Development Effort
- Engaging the Desktop Community
- Convincing It's Achievable

The reward in sight :

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



Bootstrapping | 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...



Bootstrap and long term relationship



• Main challenge

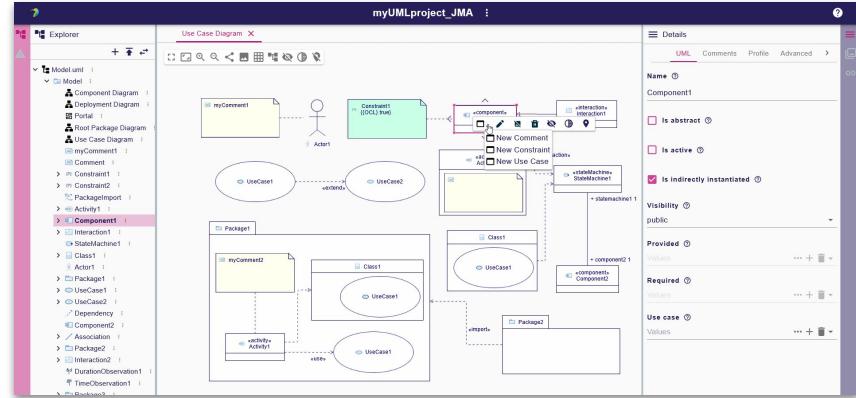
- Modernize **Papyrus** and ease the maintenance
- Get a partner able to support such deployments
- Get ready for experimenting and contributing to the next generation of modeling tools:
 - Augmented Engineering
 - Digital Thread
 - Secured collaboration at scale
 - Green Tech
- a brand new standard : 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>

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

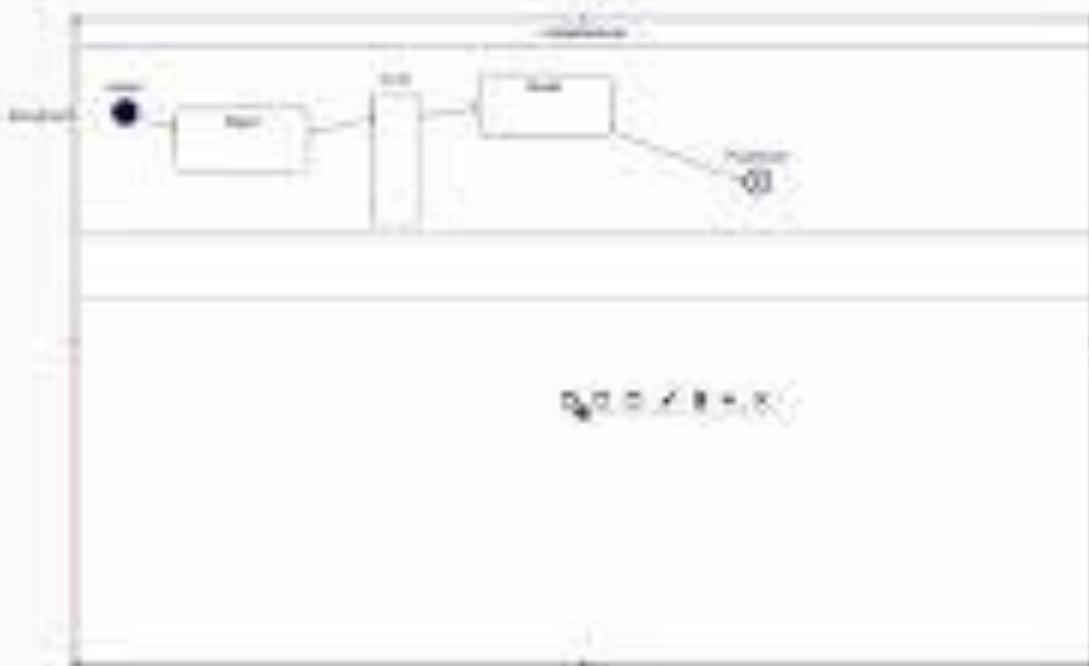


Viewing or authoring a SysML v2 model should be easily available to every Systems Engineers and beyond.



Flowchart

2023-06-21 10:10:45 2023-06-21 10:10:45 2023-06-21 10:10:45 2023-06-21 10:10:45



2023-06-21 10:10:45

2023-06-21 10:10:45

2023-06-21 10:10:45 2023-06-21 10:10:45

Notes

- 1. 1. **Introduction**
 - **Background**
 - **Objectives**
 - **Report**
- 2. 2. **Methodology**
 - **Log**
 - **Questionnaire**
 - **Log**
 - **Interviews**
 - **Log**
 - **Case Studies**
 - **Log**
 - **Case**
 - **Log**
 - **Report**
 - **Report**
 - **Case Studies**
 - **Log**
 - **Report**
 - **Report**
 - 3. 3. **Conclusion**
 - **Log**
 - **Report**
 - **Report**
 - 4. 4. **References**
 - **Log**
 - **Log**
 - **Log**
 - 5. 5. **Other notes**
 - **Log**
 - **Report**
 - **Report**

Links

- 1. 1. **Log**
- 2. 2. **Log**
- 3. 3. **Log**
 - **Introducing New**
 - **Log**
 - **Log**
- 4. 4. **Report**
- 5. 5. **Report**

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!



Thank you