



Advancing Web-Based Modeling Tools with Sirius Web:

An Illustration with SysON





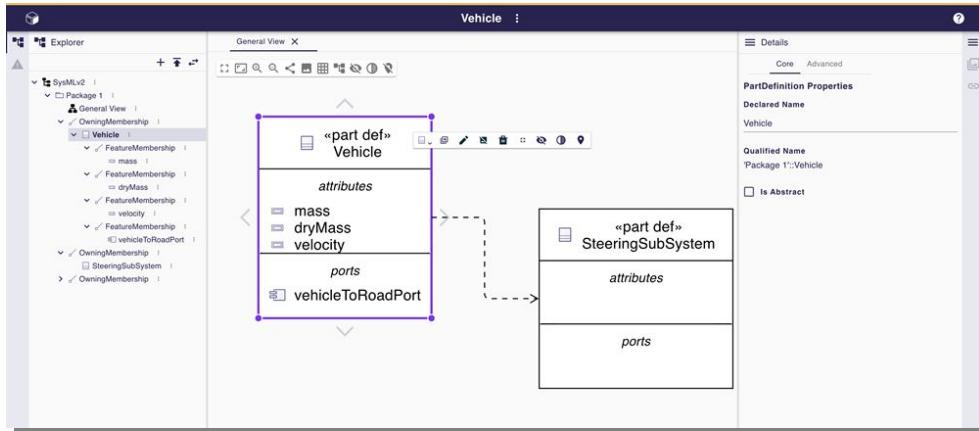
**EASILY CREATE AND DEPLOY
MODERN MODELING TOOLS TO THE CLOUD**

Our Throughline during this Presentation : SysON



<https://mbse-syson.org/>

SysML v2 web-based authoring tool available as open-source



Standard-Compliant

SysML v2 Language concepts,
REST API, interoperability
textual format



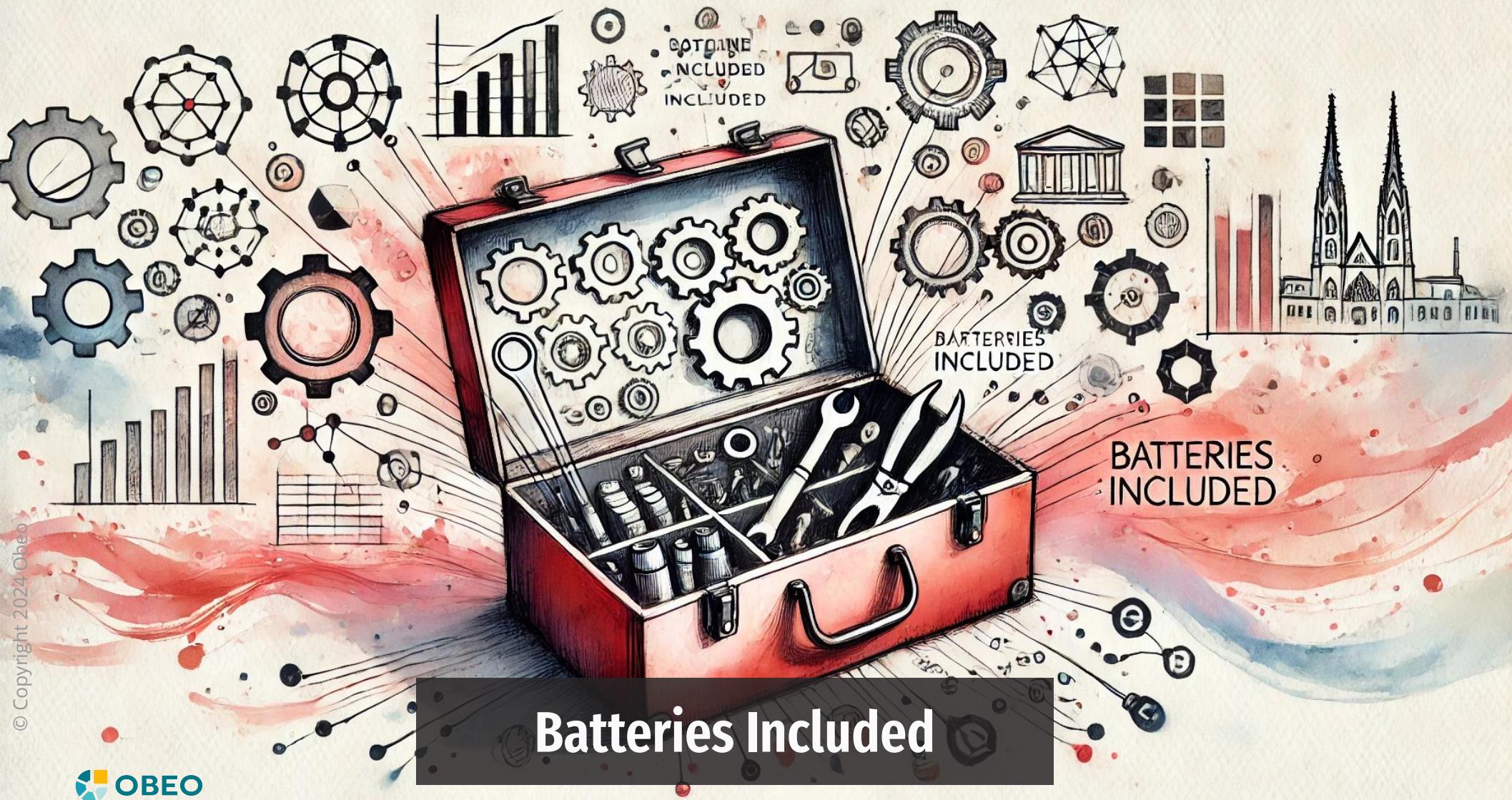
Web-Based

Graphical, form-based and tabular
structured editors in a web
browser



Open Source

Hosted in the Eclipse community,
to catalyze industrial collaboration



Batteries Included



Batteries Included | Fundamentals

Auto-Layout, Hide, Shade, Zoom, SVG ...

The screenshot illustrates the Obeo Model Explorer interface for a SysMLv2 model. The left pane shows the Model Explorer with a tree view of packages and their contents. A callout box labeled "Import/Export" points to the "Import/Export" button in the Model Explorer toolbar. The main workspace displays a "Vehicle" part definition. The "General View" tab is selected. The "Contextual palette" is open, showing various icons for editing. The "Rich Property View" is also open, displaying properties for the "Vehicle" part definition. The "PartDefinition Properties" section includes:

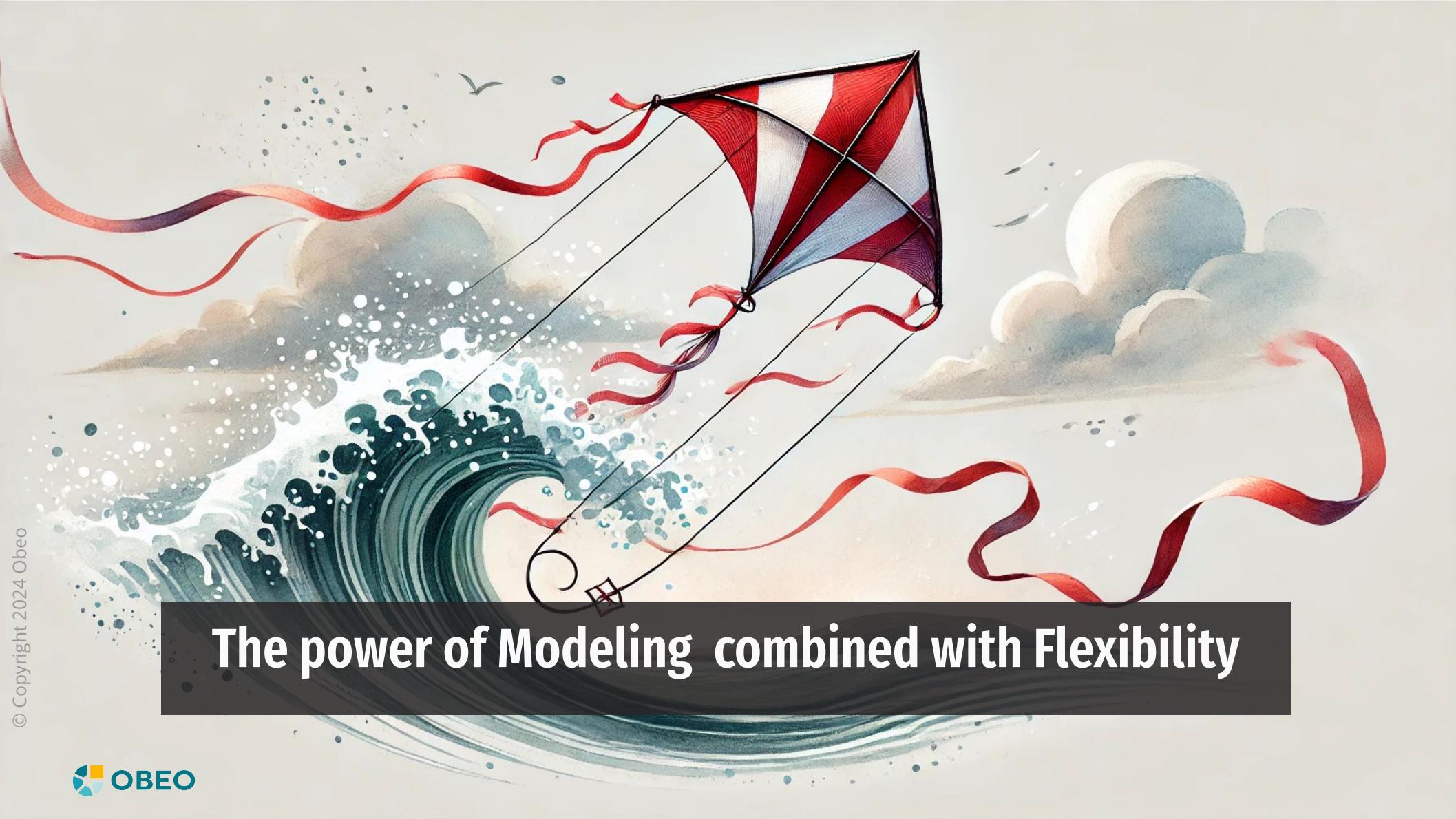
- Declared Name:** Vehicle
- Qualified Name:** Package 1::Vehicle
- Is Abstract:**

The "Vehicle" part definition has the following structure:

- Attributes:** mass, dryMass, velocity
- Ports:** vehicleToRoadPort

The "SteeringSubSystem" part definition is shown as a related element.

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The power of Modeling combined with Flexibility

The power of Modeling + Flexibility | Fundamentals

"Adapt the tooling to the goal, whatever the metamodel and its structure"

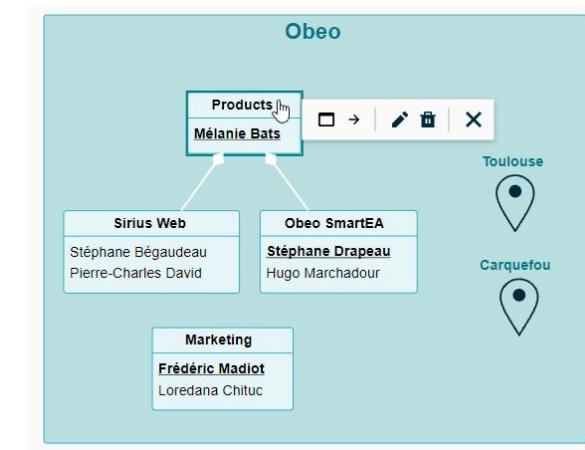
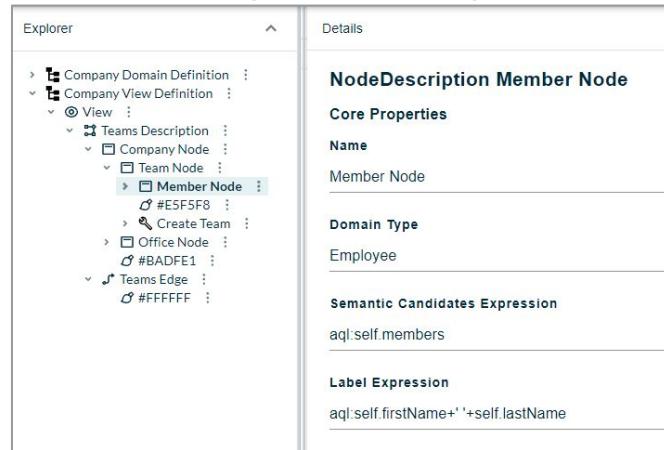
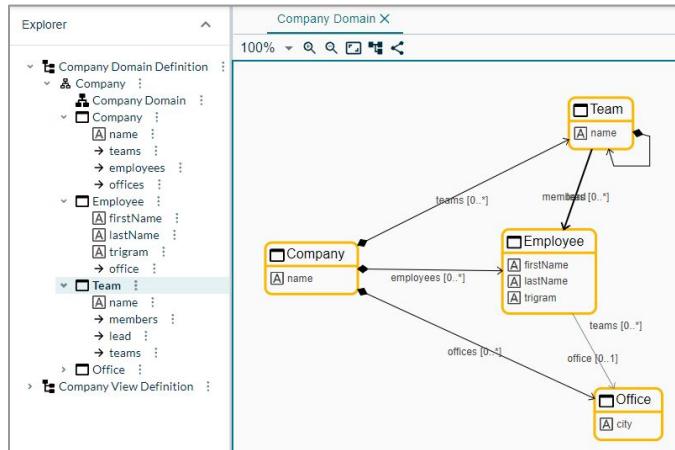
Domain/Ecore model

+

Editors specification
(View Model)

=

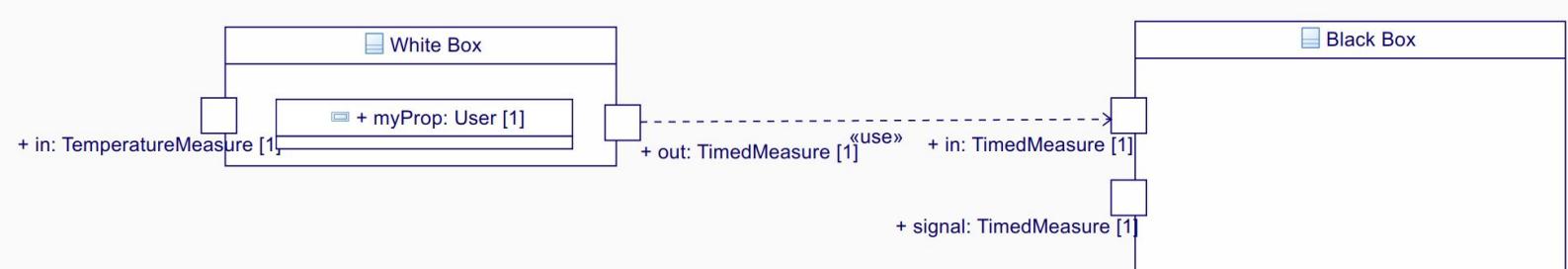
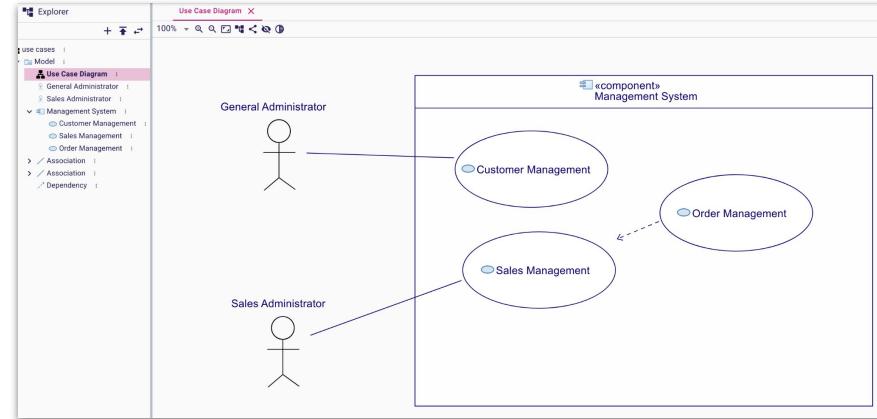
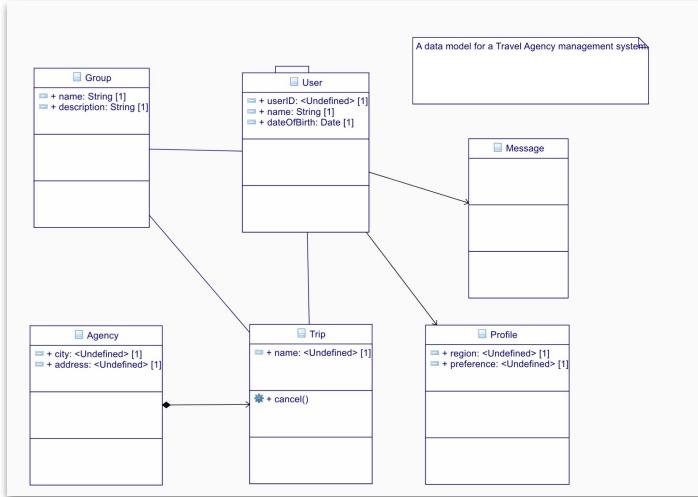
Modeling Workbench



Papyrus UML | The power of Modeling + Flexibility

UML

UML implementation from Eclipse
Standard conformant
Supports profiles



"Projects" DSL | The power of Modeling + Flexibility

Project Management DSL

Ecore Metamodel
Uses Forms + Gantt

The screenshot displays a Project Management DSL interface. At the top, there's a header bar with a search icon, a refresh icon, and a share icon. Below it is a table with columns for Name, From, To, Assignee, and a series of dates from Friday, 8 to Thursday, 14. The rows represent tasks: Idea, Specification, Development, Code Development, Review, and Release. The 'Idea' task is selected, showing a tooltip with details: 'Idea: 9-12-2023 - 10-12-2023', 'Duration: 1 day(s)', and 'Progress: 50 %'. Below the table is a horizontal timeline with a yellow progress bar labeled 'Code Dev'. At the bottom, there's a section for adding new cards, with a button labeled 'Add card'.

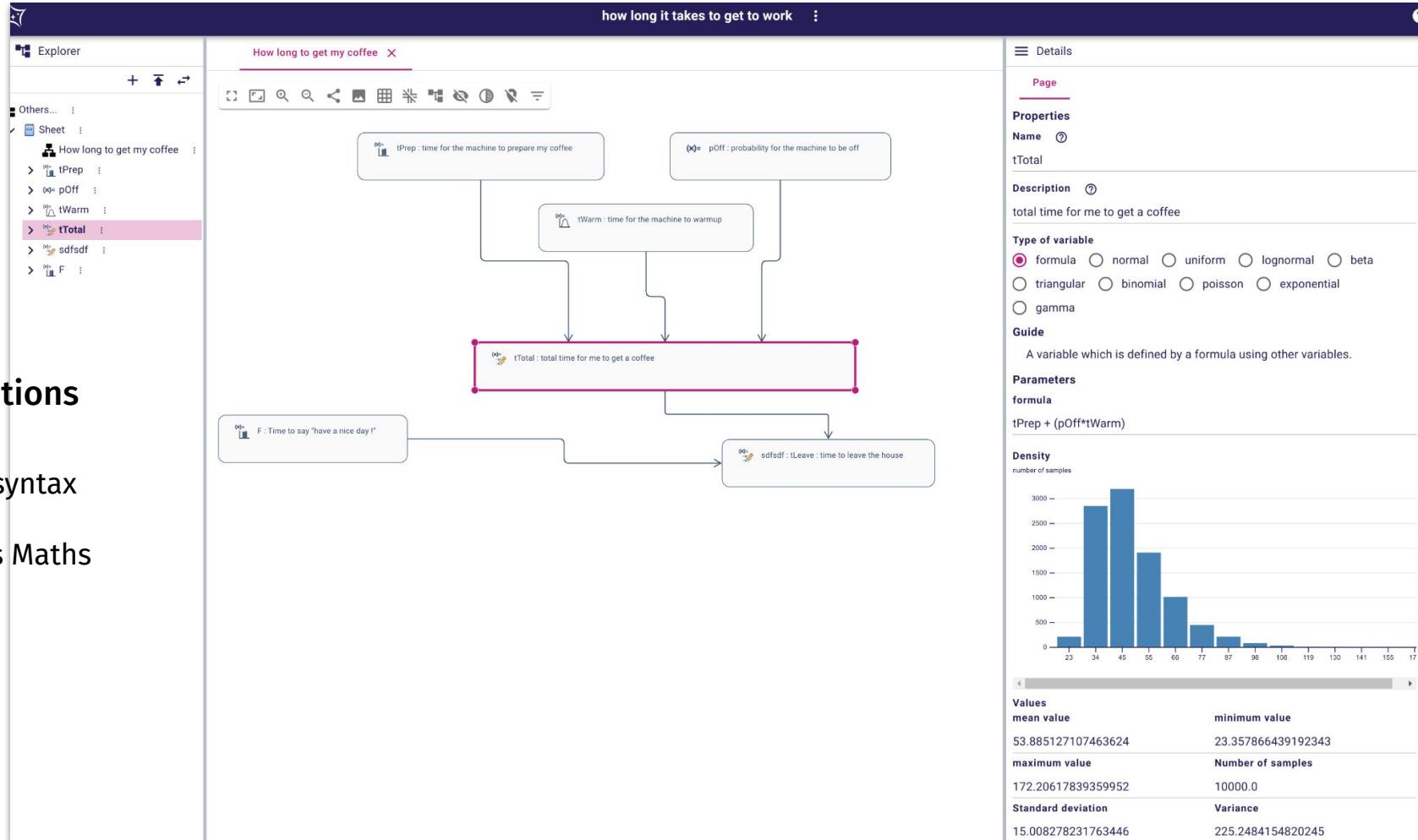
The screenshot shows a backlog view with three columns: Monday, Tuesday, and Wednesday. Each column has a count of cards (0 / 4, 2 / 4, 1 / 4) and a list of tasks. The 'Monday' column has a 'New Card' button. The 'Tuesday' column lists 'Idea' and 'Development'. The 'Wednesday' column lists 'Specification'. Below each column is a placeholder text: 'Click to add card'.

Guesstimate DSL | The power of Modeling + Flexibility



Monte-Carlo Simulations

Simple Ecore Model
Formulas with textual syntax
Uses Charts
Uses Apache Commons Maths



SysMLv2 a. k. a. SysON | The power of Modeling + Flexibility

System Engineering

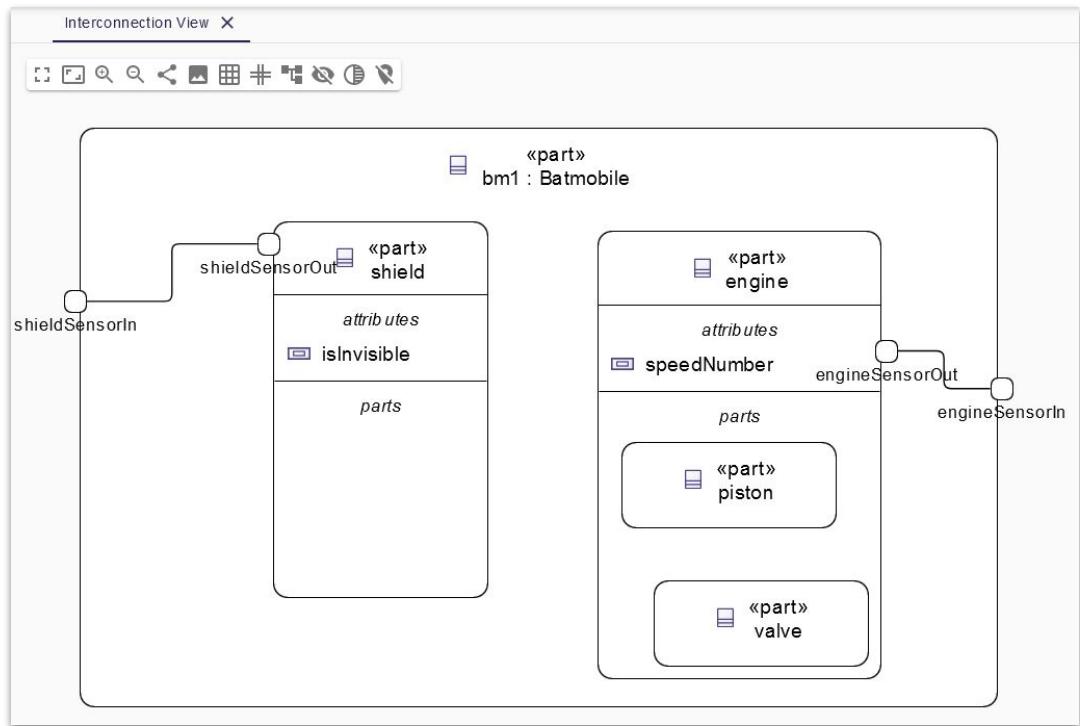
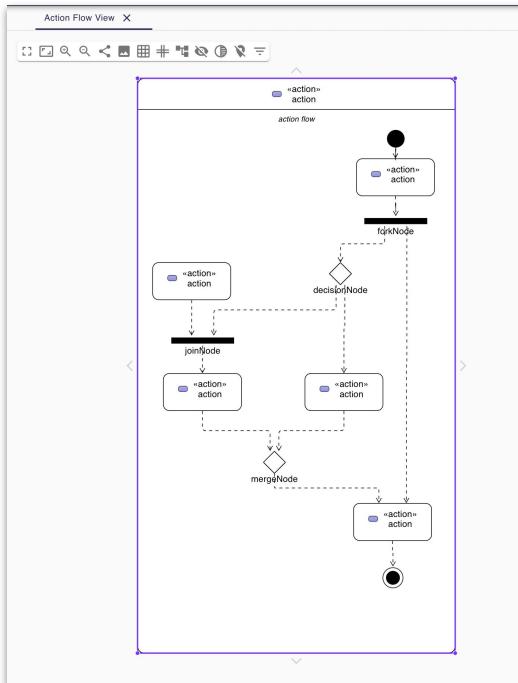
Ecore based Metamodel

Memberships and Typing management

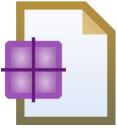
General View

Interconnection View

Action View



Models in Different Shapes | The power of Modeling + Flexibility



Editors specification (View Model)



Explorer

Details

NodeDescription Member Node

Core Properties

Name: Member Node

Domain Type: Employee

Semantic Candidates Expression: aql:self.members

Label Expression: aql:self.firstName+' '+self.lastName

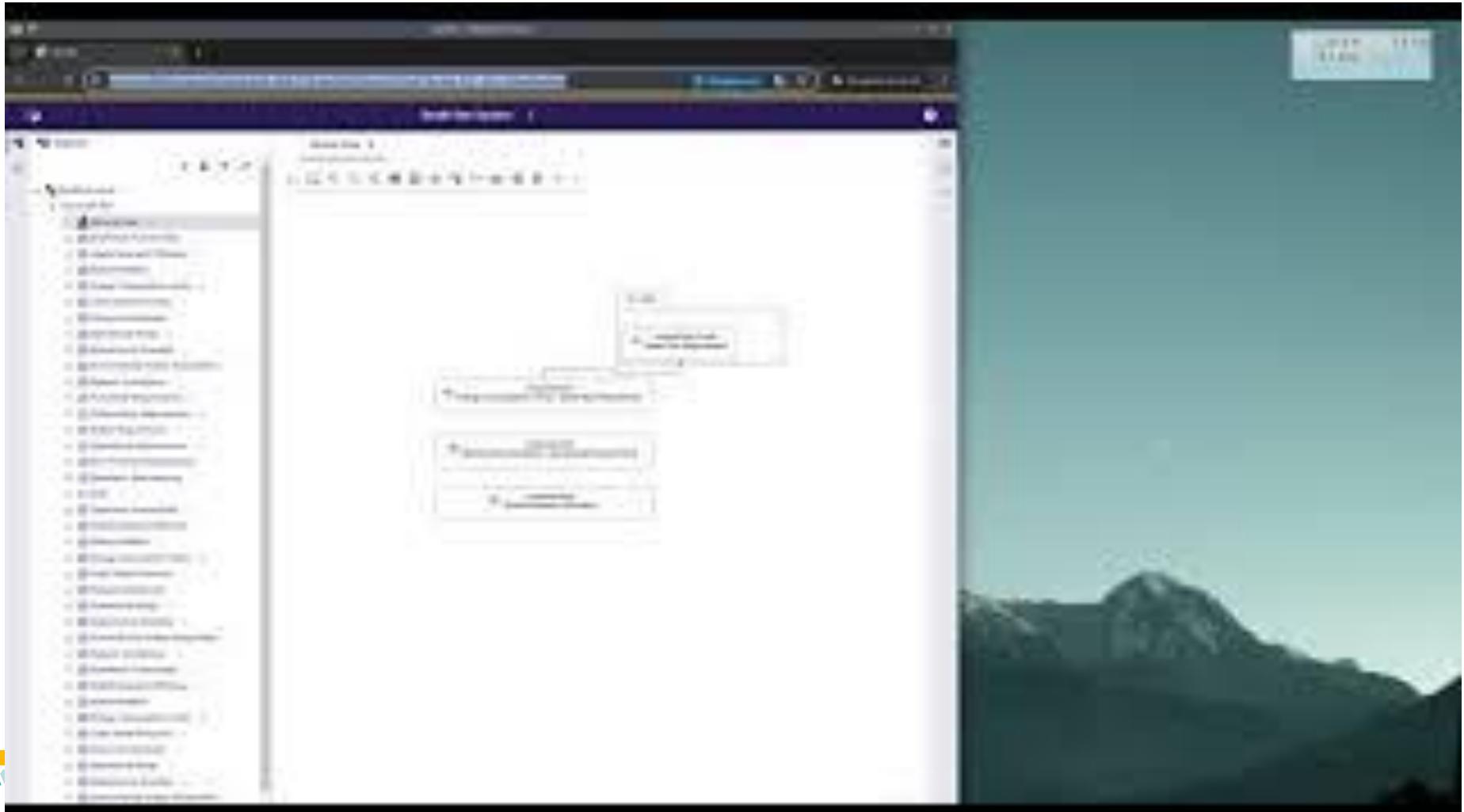
Tree View:

- Company Domain Definition
- Company View Definition
 - View
 - Teams Description
 - Company Node
 - Member Node #E5F5F8
 - Create Team
 - Office Node #BADE1
 - Teams Edge #FFFFFF

```
NodeDescription distributionMapping = b.newNodeDescription()
.name("Variables")
.domainType(typeName(domain.getVariable()))
.defaultWidthExpression("80")
.defaultHeightExpression("30")
.insideLabel(b.newInsideLabelDescription()
.labelExpression("aql:self.name + ' : ' + self.documentation")
.position(InsideLabelPosition.TOP_LEFT)
.style(b.newInsideLabelStyle()
.labelColor(this.variableColor)
.showIconExpression("true")
.fontSize(8)
.displayHeaderSeparator(true)
.withHeader(true)
.borderWidth(0)
.borderColor(this.variableColor)
.build())
.conditionalStyles(b.newConditionalInsideLabelStyle()
.condition("aql:self.hasValidationError()")
.style(b.newInsideLabelStyle()
.labelColor(this.errorColor)
.showIconExpression("true")
.fontSize(8)
.displayHeaderSeparator(true)
.borderWidth(0)
.borderColor(this.errorColor)
.build())
.build())
.build())
.style(b.newRectangularNodeStyleDescription()
.borderRadius(8)
.borderWidth(1)
.borderColor(this.variableColor)
.background(this.background)
.borderLineStyle(LineStyle.SOLID)
.build())
.palette(b.newNodePalette()
.labelEditTool(editLabel)
.build())
.build());
```

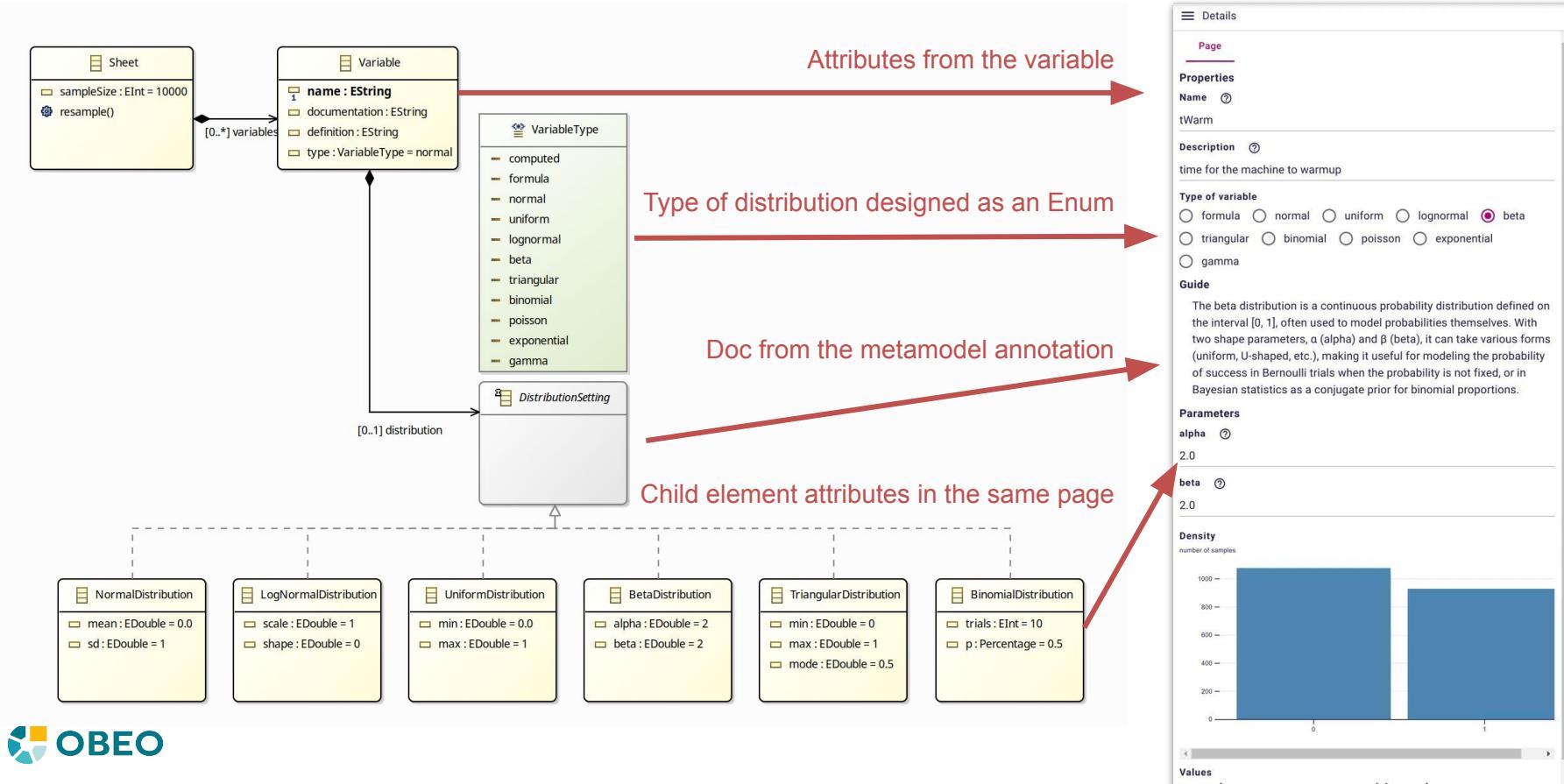
Eased Adoption and User Experience

One click Onboarding | Eased Adoption and User Experience

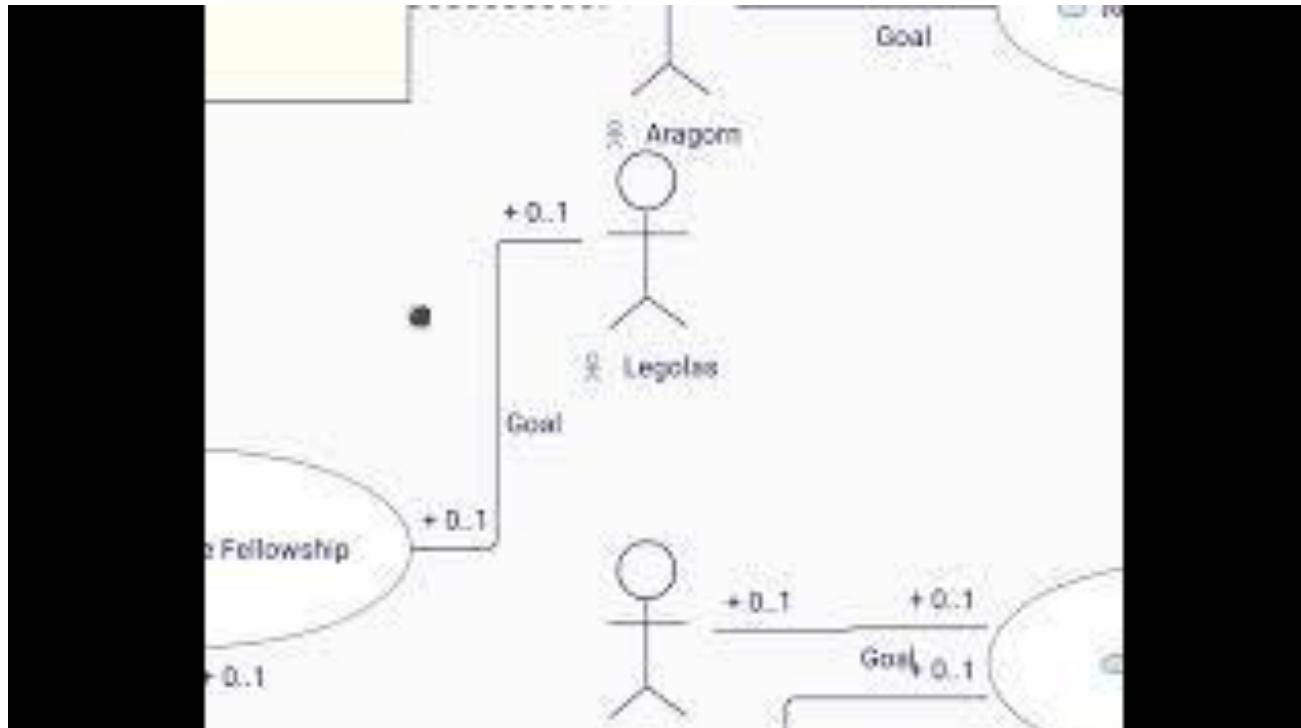


Property Views | Eased Adoption and User Experience

Great by default and 100% customizable through the view model



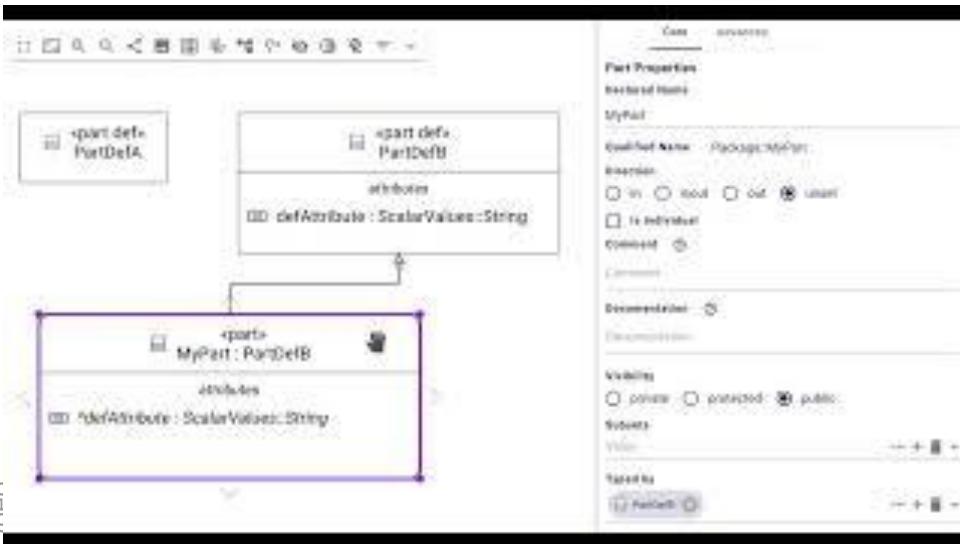
Rendering Quality | Eased Adoption and User Experience



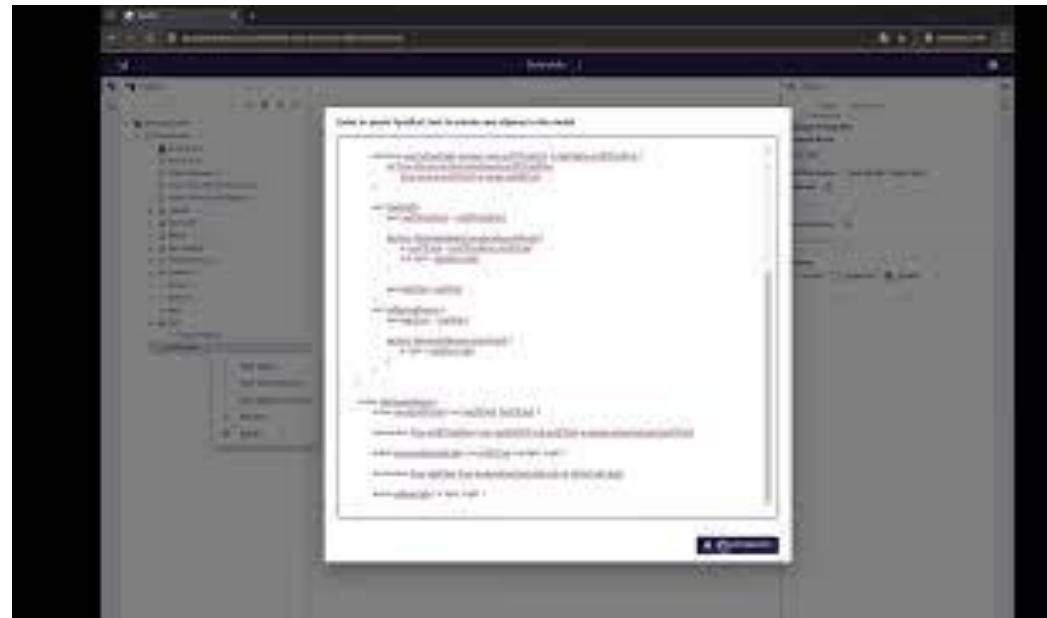
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Tailored Text editing | Eased Adoption and User Experience

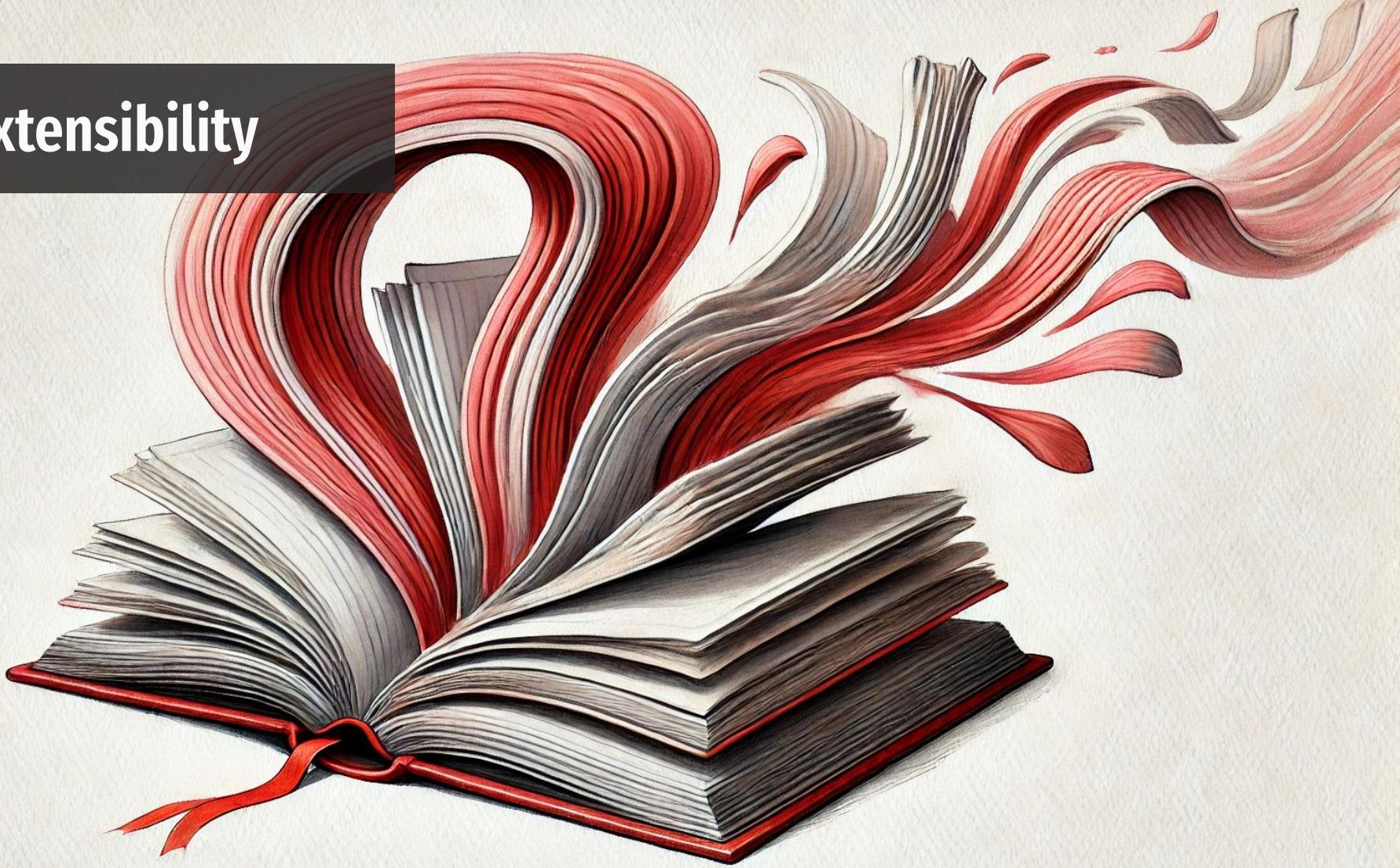
"Smart" label edit



Import/export .sysml files.
Import elements from sysmlv2 syntax:



Extensibility



Extensibility | Fundamentals

Sirius Web

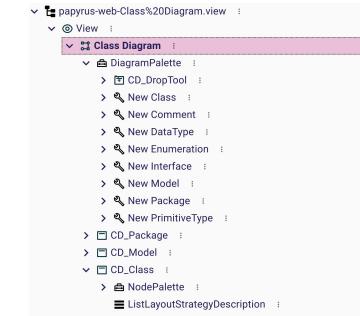
Modular platform to define visual modeling tools

React + GraphQL

Huge ecosystem of widgets

Spring Boot

Java back-end,
Industry Standard



View Model

Define the graphical editors, forms, tables

Java Services

Specific logic in the tool

Third Party components

Through Maven (backend)
or NPM (frontend)

Backend Implementations | Extensibility

```
/**  
 * Configuration of the EMF support for SysON (i.e. SysML metamodel).  
 *  
 * @author arichard  
 */  
@Configuration  
public class SysMLv2EMFConfiguration {  
    @Bean  
    AdapterFactory sysmlAdapterFactory() {  
        return new SysmlItemProviderAdapterFactory();  
    }  
  
    @Bean  
    EPackage sysmlEPackage() {  
        return SysmlPackage.eINSTANCE;  
    }  
}
```

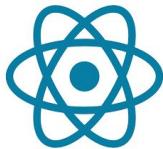
Tells Spring Boot to scan and retrieve the instances to inject those

Declares an additional Adapter Factory

Spring will inject the known EPackages at init

```
@Component  
public class MyService {  
  
    @Autowired  
    private List<EPackage> registeredPackages = Lists.newArrayList();  
    // ...  
}
```

User Interface Contributions | Extensibility



Leverage the huge React eco-system for the frontend

Create a new project **Cards contributed with CreateProjectAreaExtensionPoints**

Menu contributed with **NavigationBarMenuExtensionPoint**

+ Blank Studio + Flow + Sirius Web + Blank project + Upload pro... Show all tem...

Tree item context menu contributed with **treetemContextMenuItemEntryExtensionPoint**

- + New object
- + New representation
- ▷ Expand all
- ✍ Rename
- ☒ Delete

More details here :

<https://blog.obeosoft.com/sirius-web-2024-9>

java.base component diagram X

Component

Panels contributed with **DiagramRendererExtensionPoints**

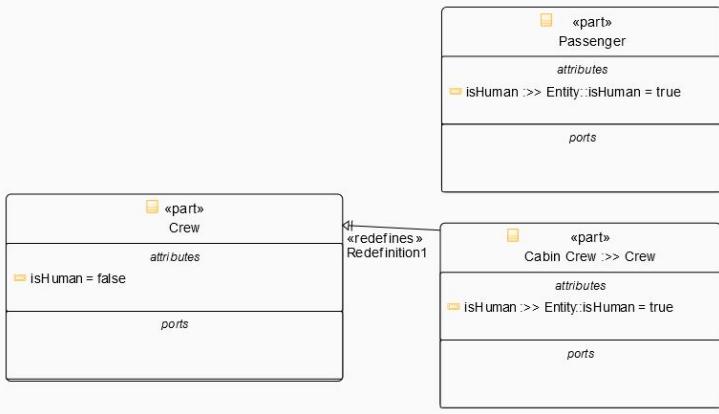
Legend
1 nodes
0 edges

Learn more
Follow these links to view the code of this Sirius Web internal test project on Github.

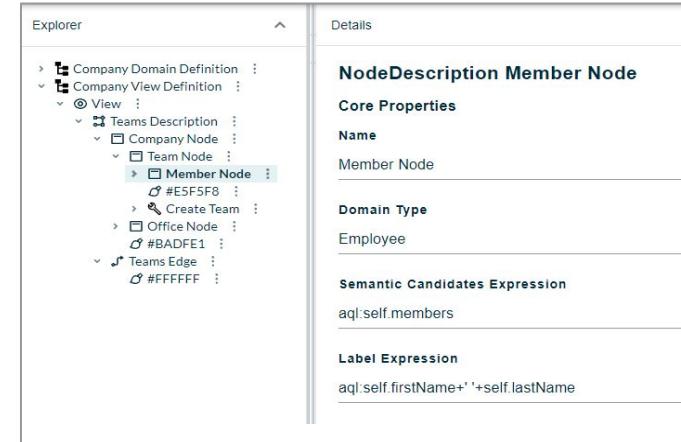
- Backend code
- Frontend code

Model Based | Extensibility

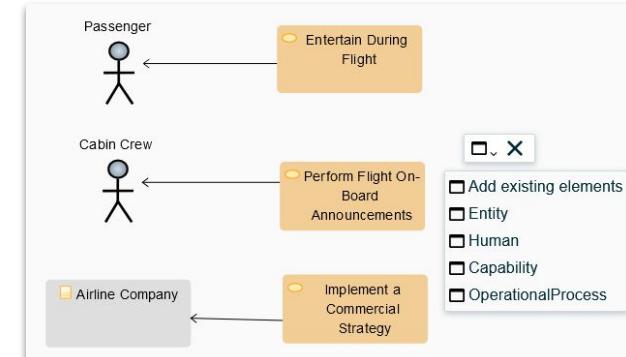
SysMLv2 library

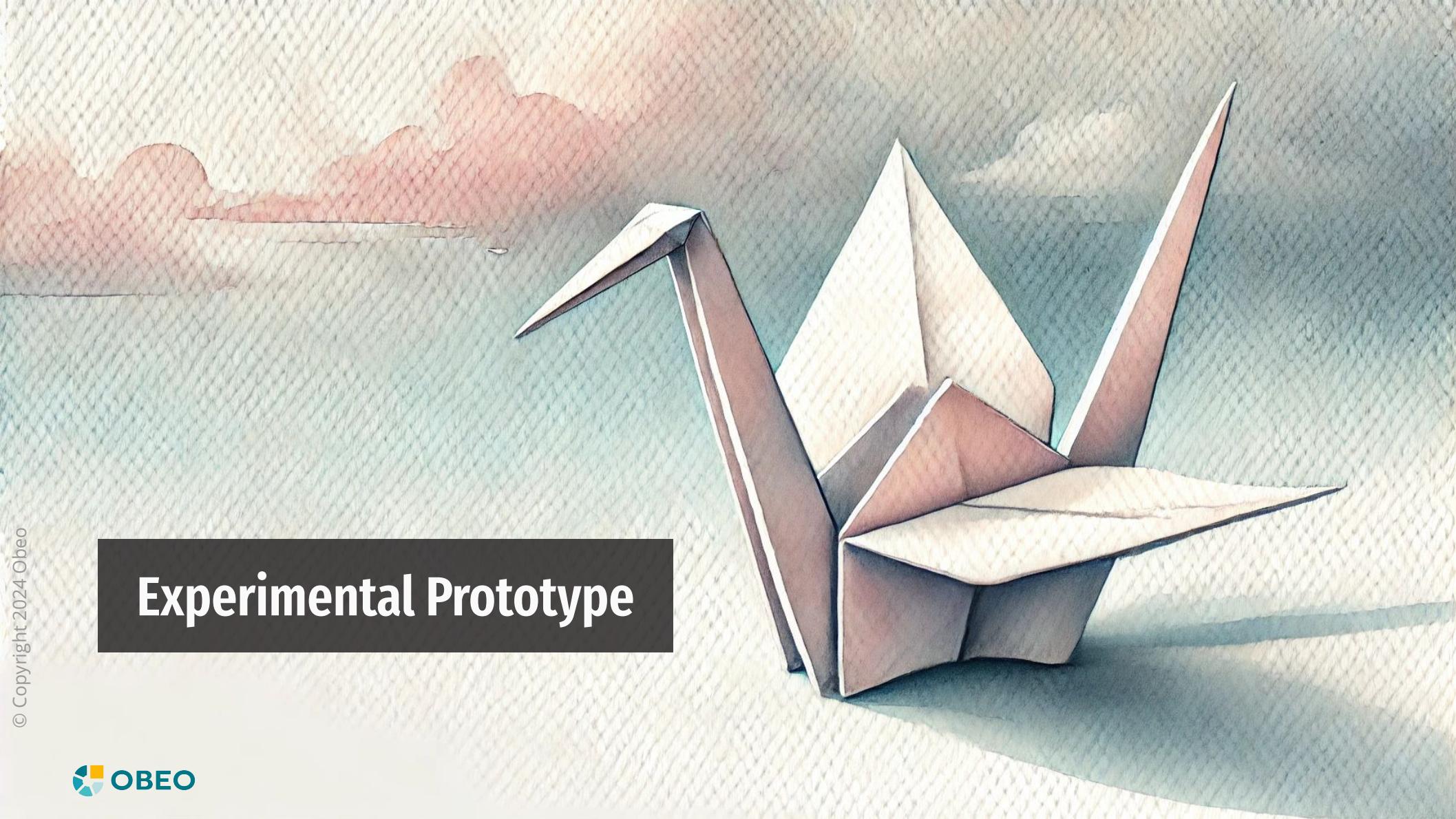


Editors specification
(View Model)



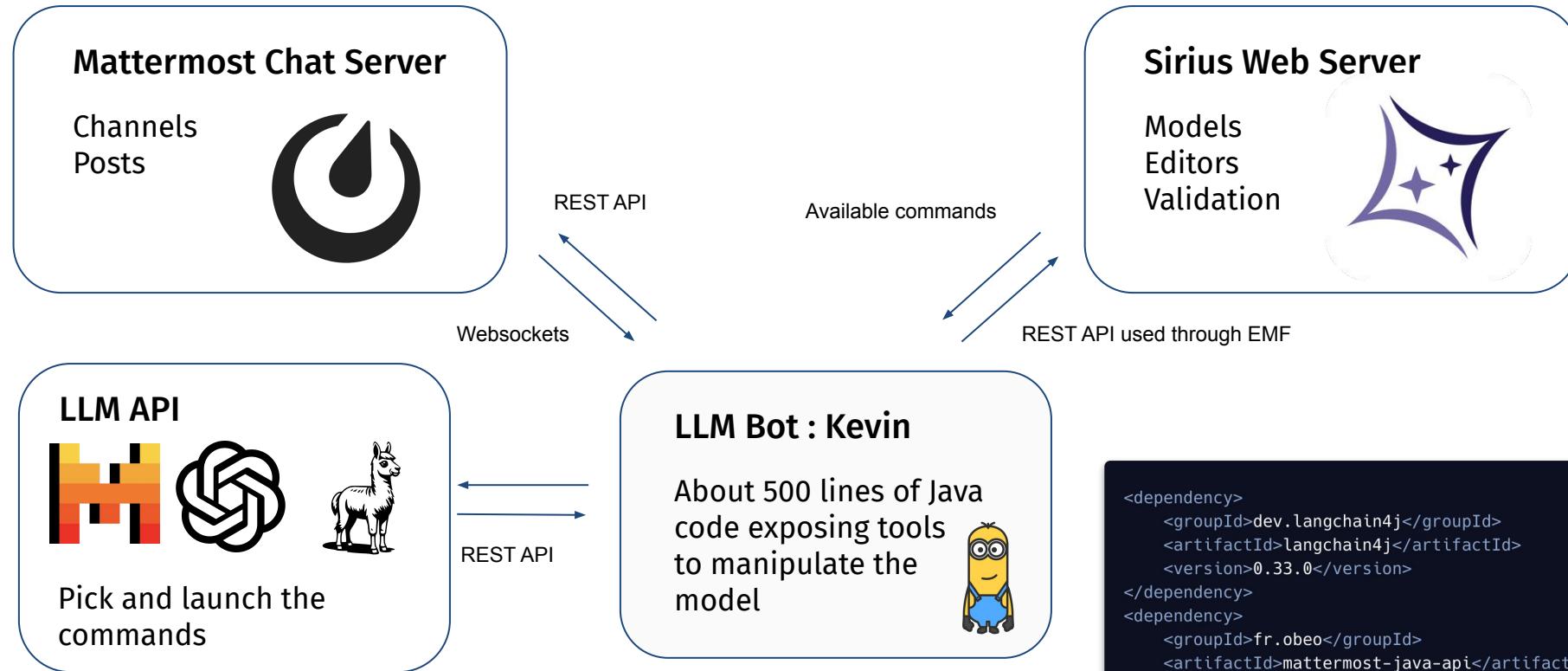
Tailored Editor





Experimental Prototype

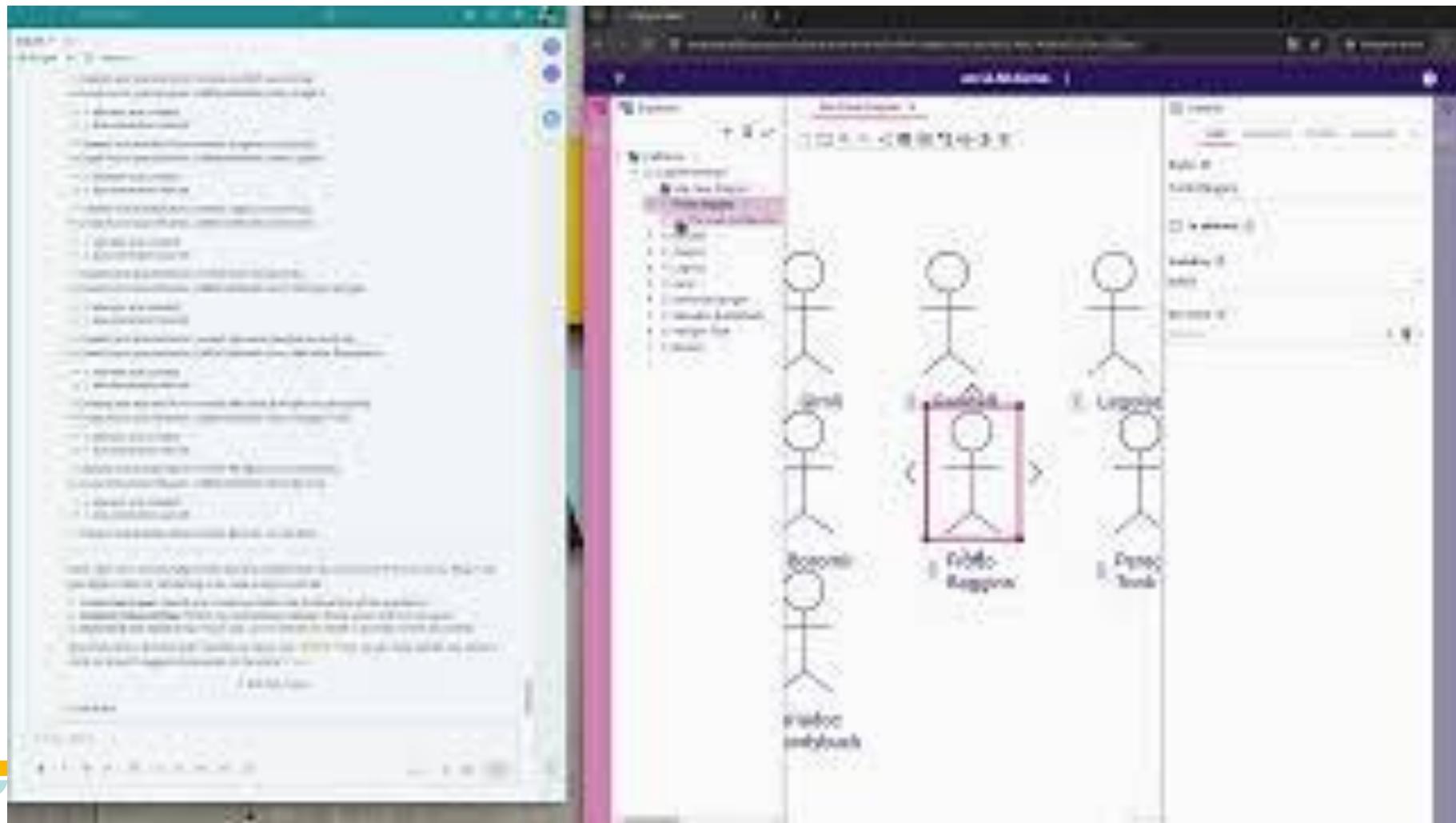
LLM + Your Modeling Tool | Integration



This to illustrates you can start your prototype early and easily.
Iterate, evaluate and focus on the research.

```
<dependency>
    <groupId>dev.langchain4j</groupId>
    <artifactId>langchain4j</artifactId>
    <version>0.33.0</version>
</dependency>
<dependency>
    <groupId>fr.obeo</groupId>
    <artifactId>mattermost-java-api</artifactId>
    <version>0.0.1-SNAPSHOT</version>
</dependency>
```

LLM + Your Modeling Tool | Integration



Industrial Strength | Fundamental

1

Strong, well known technological basis

Java, Spring Boot, Eclipse Modeling and React

2

Obeo is here to support

Training, sponsored development, industrialization

In the context of R&D projects

Trainings & on Demand Expertise

Pool of days to assist

Sub contracting

Develop features and POCs in R&D project

Project Member

Obeo R&D initiative as part of the project

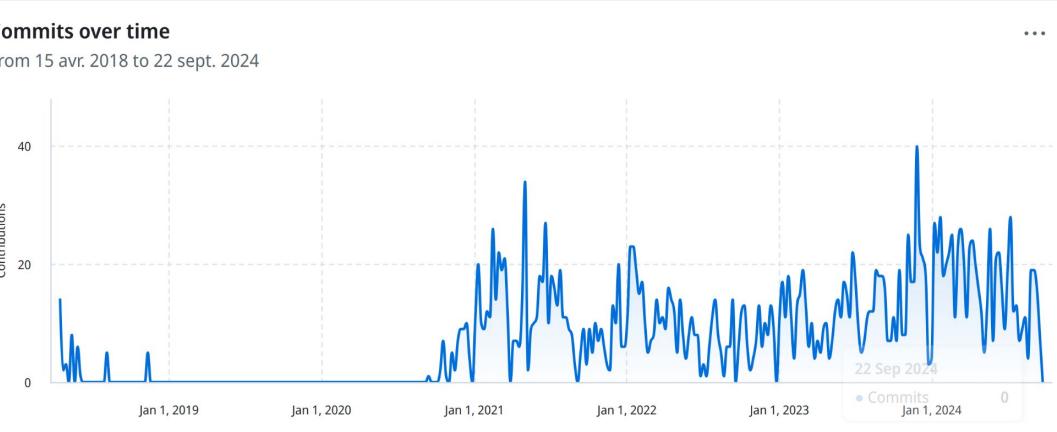
3

Enterprise Commercial Offer : Obeo Cloud Platform

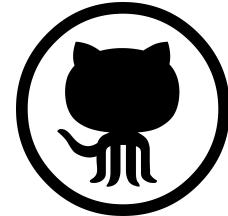
History and versioning, monitoring, team management ...

Commits over time

From 15 avr. 2018 to 22 sept. 2024



Release every 8 weeks



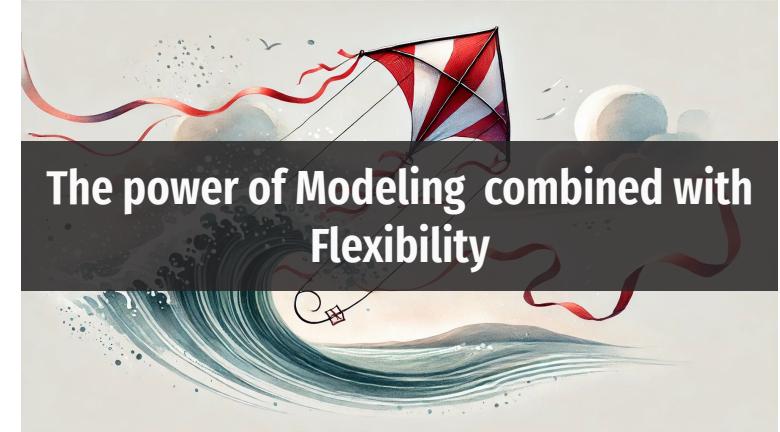
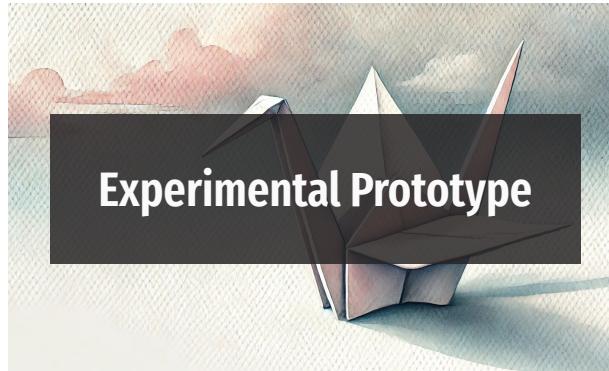
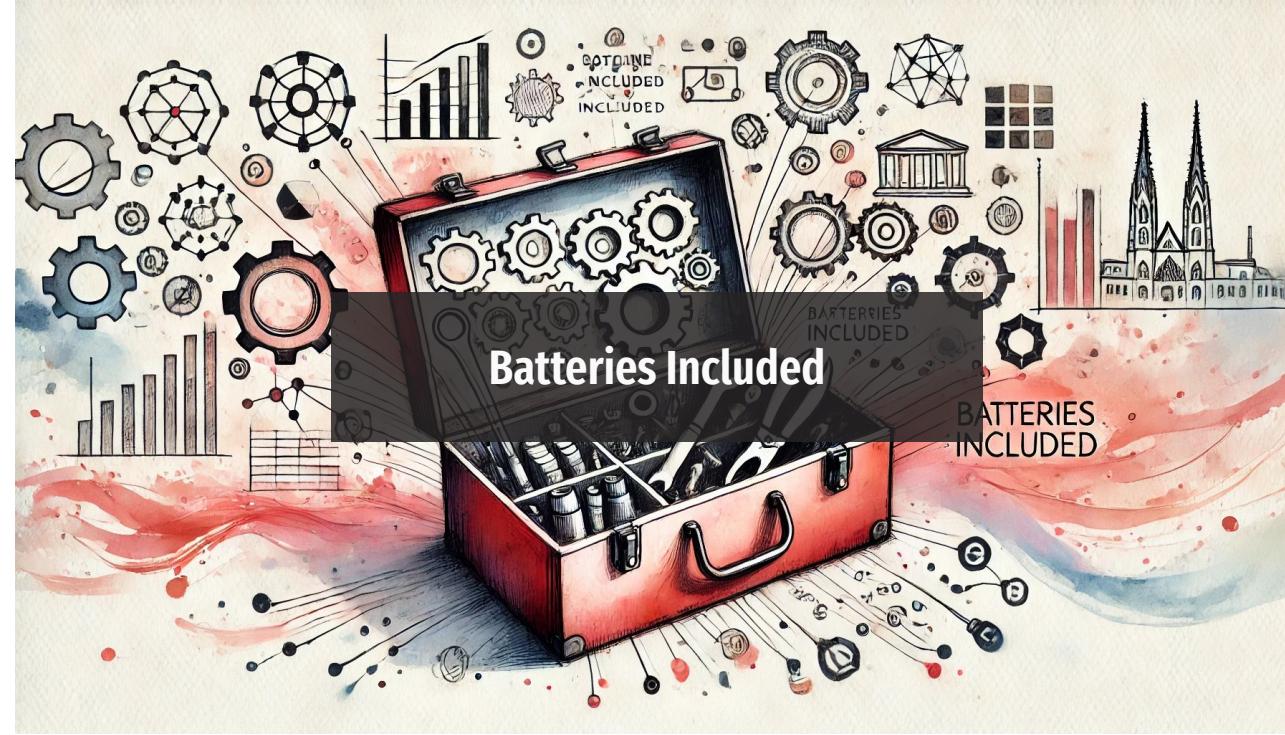
<https://github.com/eclipse-sirius/sirius-web>

<https://github.com/eclipse-syson/syson>

Tell the community you are using it!

The screenshot shows the Sirius Web Discussions interface. At the top, there's a purple header with the text "Welcome to Sirius Web Discussions!" and a "Announcements" post by pcdavid. Below the header is a search bar with "is:open" and various filter buttons: "Sort by: Latest activity", "Label", "Filter: Open", and "New discussion". On the left, there's a sidebar with "Categories" and links to "View all discussions", "Announcements", "General", "Ideas", "Polls", "Q&A", and "Show and tell". The main area is titled "Discussions" and lists several posts:

- ".odesign file into sirius-web" by belaboda-wecan, 3 weeks ago, in Q&A, Answered. 3 upvotes.
- "[Help Needed] How to integrate custom EMF Meta Model into Sirius Web" by LeoWPereira, last month, in Q&A, Unanswered. 1 upvote.
- "How to import project custom image related React components" by tiboue, Aug 20, in Q&A, Unanswered. 5 upvotes.
- "Edges inside a node container" by ..., in Q&A, Unanswered. 0 upvotes.



<https://eclipse.dev/sirius/sirius-web.html>

<https://mbse-syson.org>