



**Why settle for  
one MBSE tool  
when you can have  
an ecosystem?**

**Ulyana Tikhonova, Meinte Boersma,  
Maarten Fekkers, Pedro J. Molina**



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WE NEED INTEROPERABILITY

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# **Challenges of interoperability**

**Universal vs. specific**

**Open vs. closed format**

**Semantic mapping**

**Possibility for customizations**

**Standard vs. tools**

**Identity of the transferred elements**

**Traceability**

**Merge conflicts**

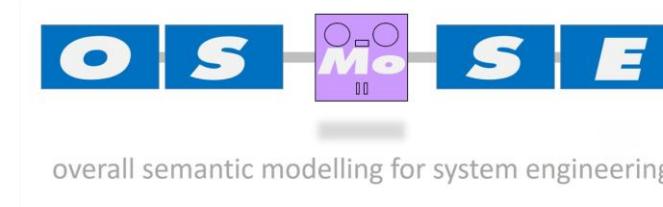
# Model Driven Engineering & Domain Specific Languages

- Capture business knowledge
- Use it as the single source of truth
- Use jargon, conventions, and notations of the domain
- Accessible for subject matter experts
- Actionable/executable with interpreters and generators

	Banking		Insurance
Taxes	Automotive	Space	Railway
Healthcare	Cyber-physical systems	Game development	

# MBSE vs MDE & DSLs

**Languages to capture the domain of System Engineering**

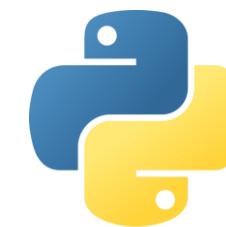
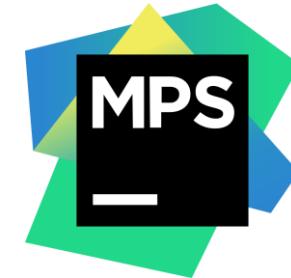


**Domain-Specific Extensions on top of them**

**MBSE tools to create, edit, and share models**



# MBSE built with MDE tools



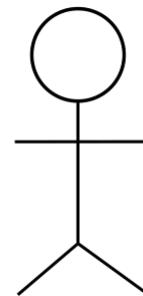
We want to choose a tool  
that fits our project  
without having to restart  
from scratch

# The real-world case

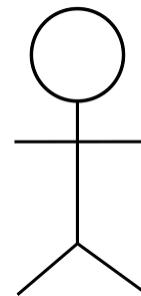
**Customers use different software to work with their specific tools.**



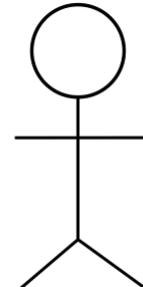
Language engineer



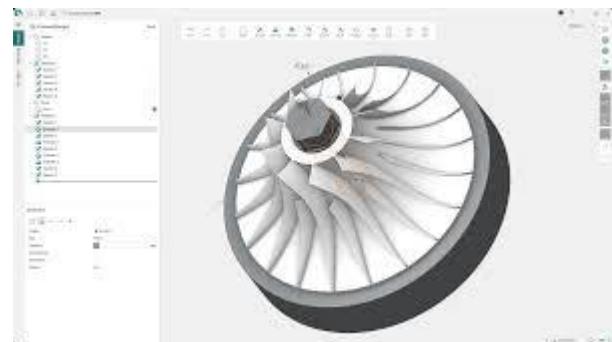
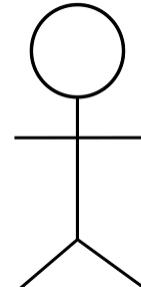
Software engineer



Designer



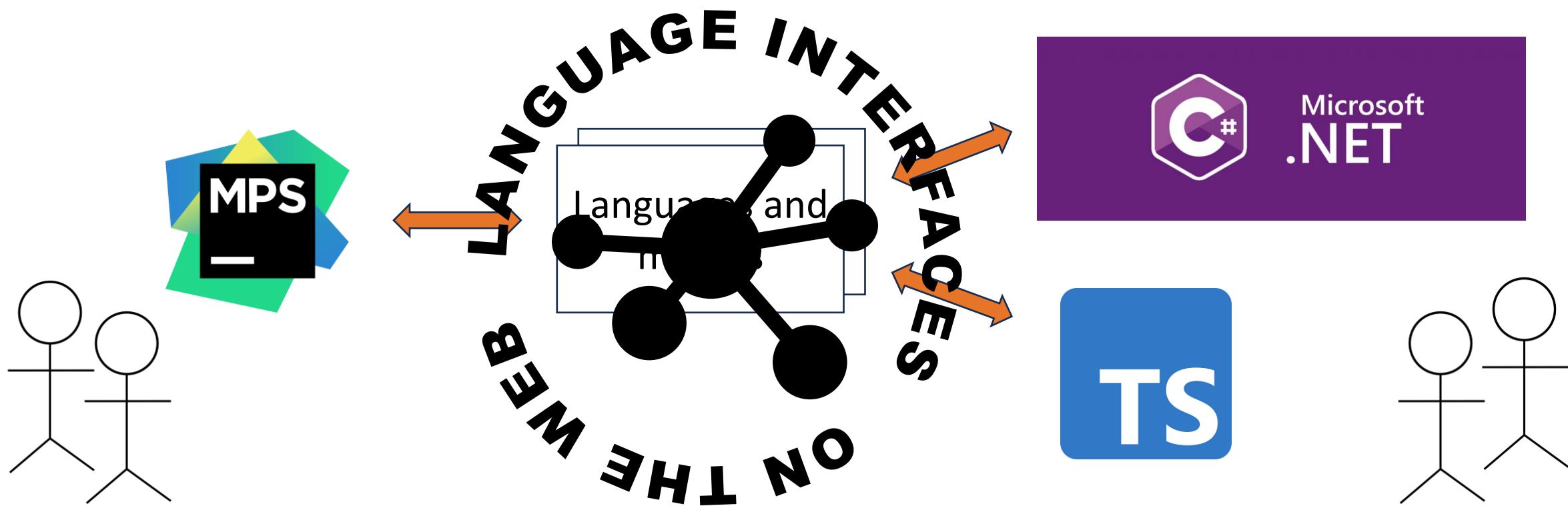
Operator



# The real-world case

Customers use different software to work with their tools.

The next generation of software uses LionWeb to assure data consistency, reducing friction.





# LionWeb: a protocol for exchanging languages and models

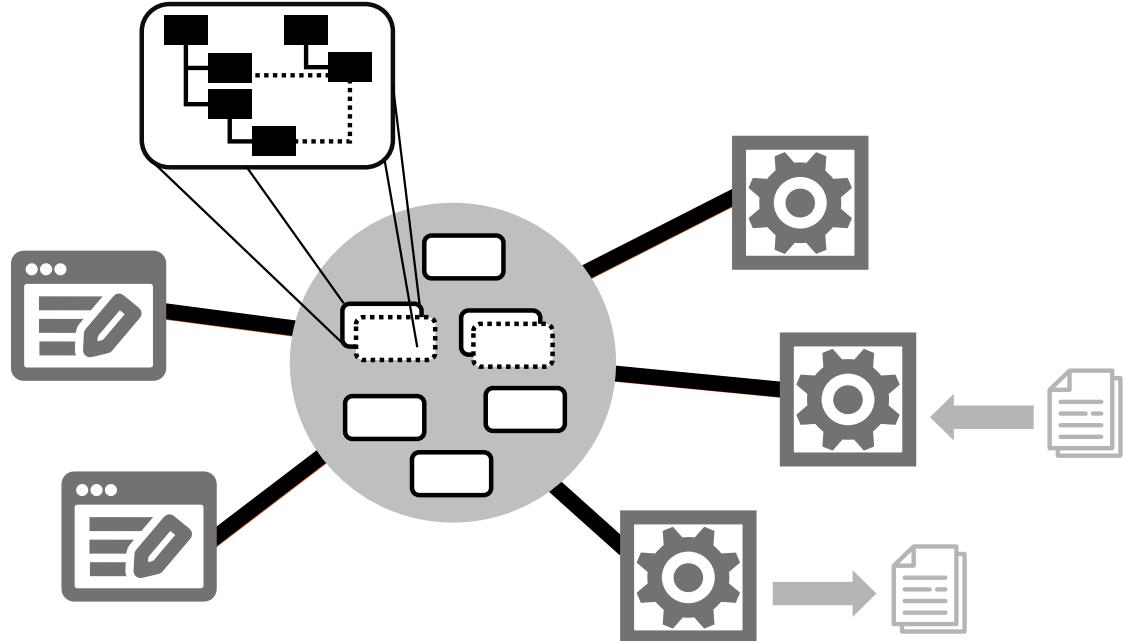
# LionWeb architecture



## Repository

### Models

- Original
- Derived



**Protocols (bulk / delta)**  
**Contents (JSON)**

## Clients

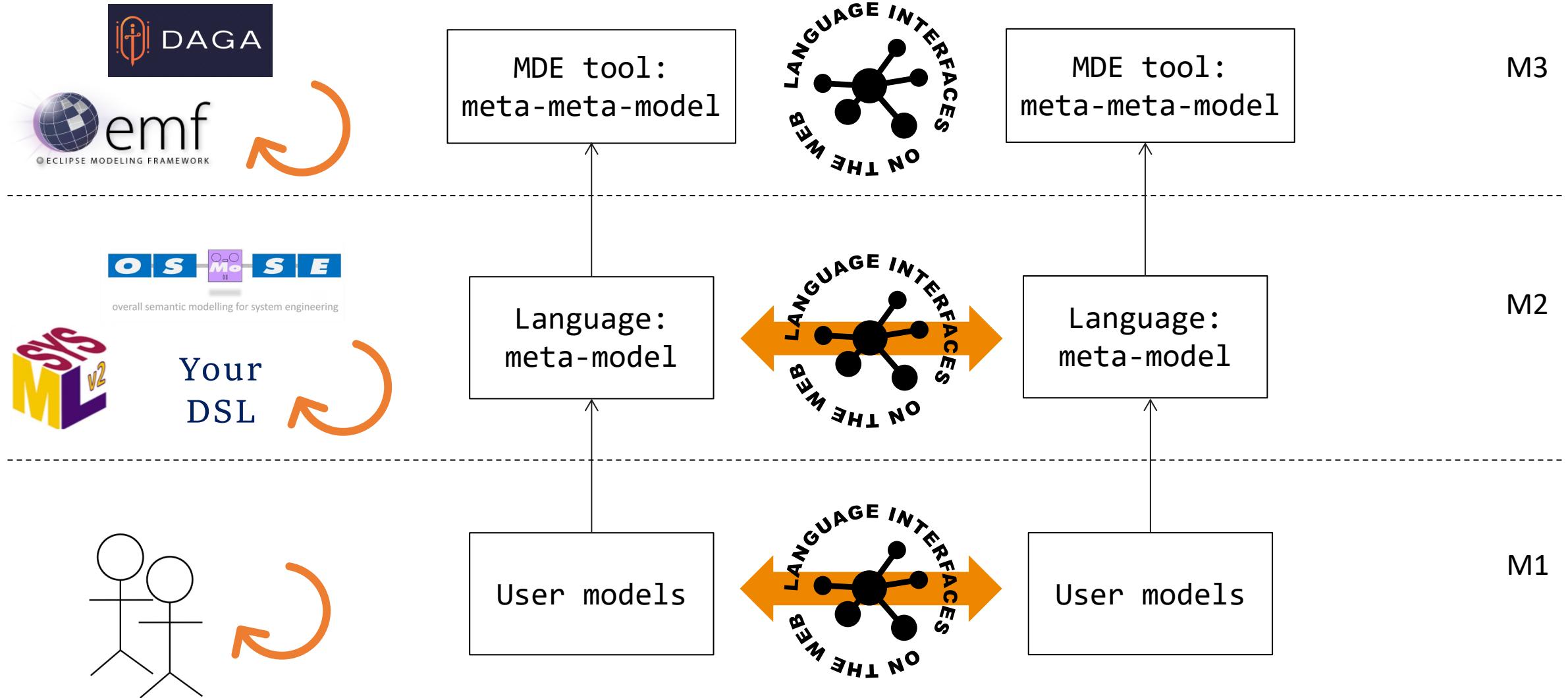
### Editors

- Textual
- Visual
- Projectional

### Processors

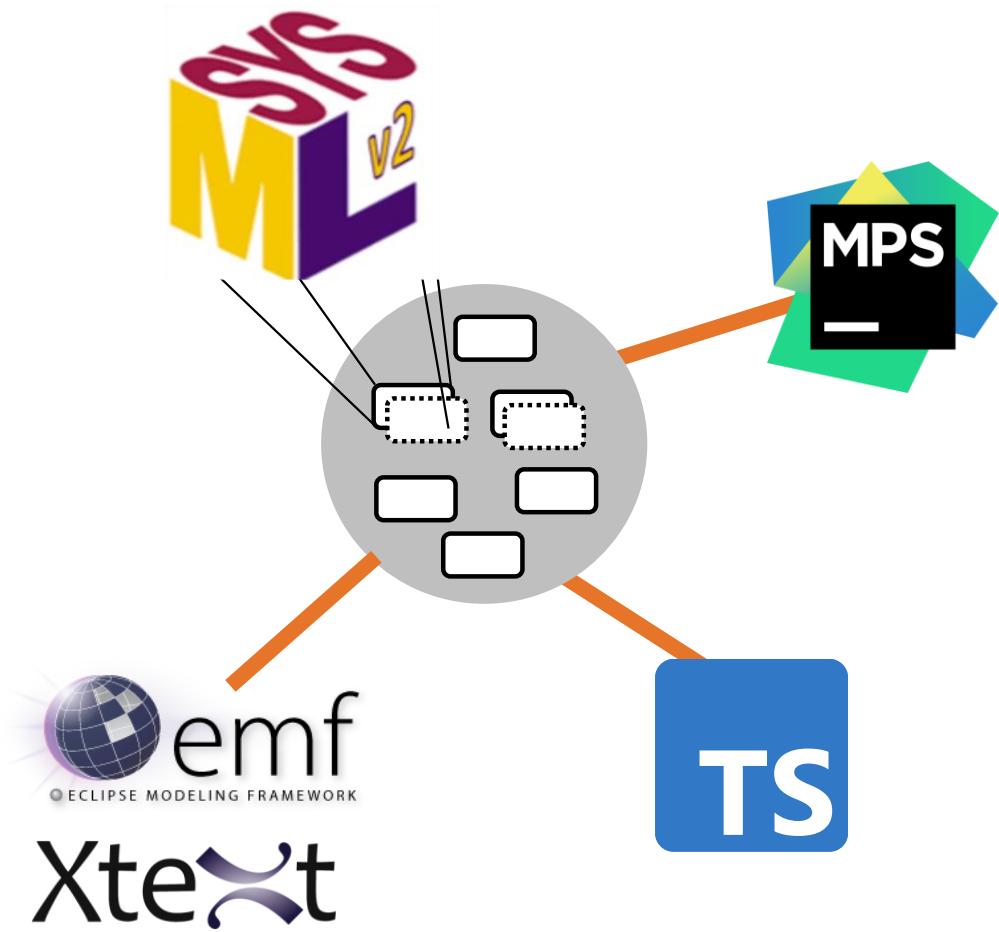
- Model checker
- Importer
- Generator

# Interoperability levels

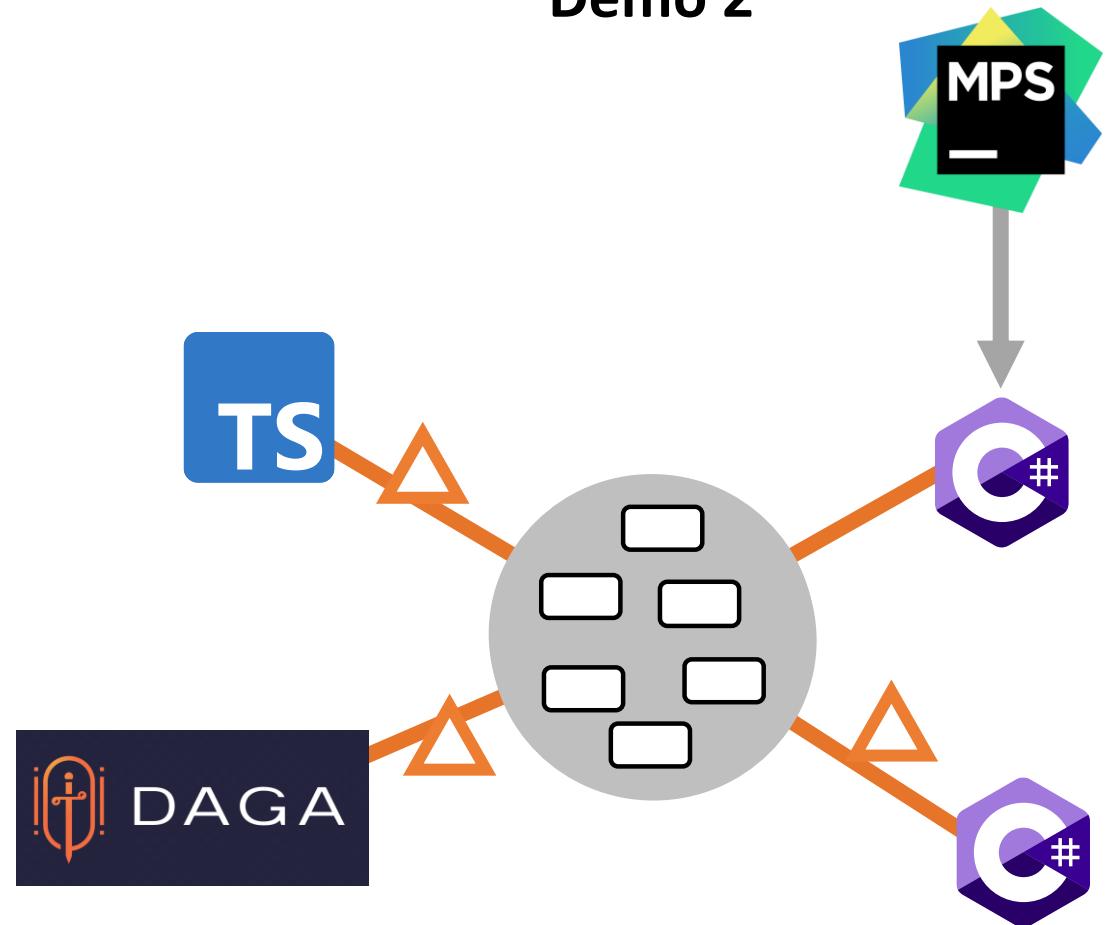


# Demo

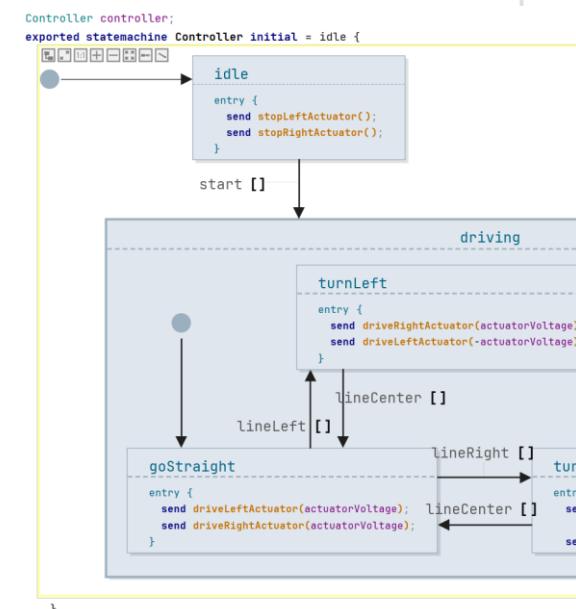
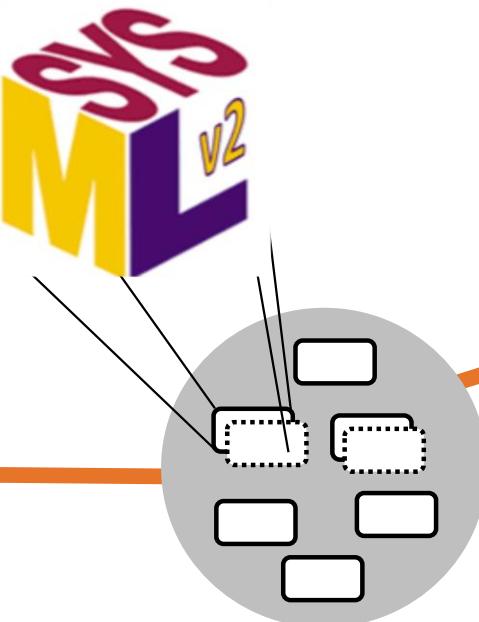
Demo 1



Demo 2



# Demo I

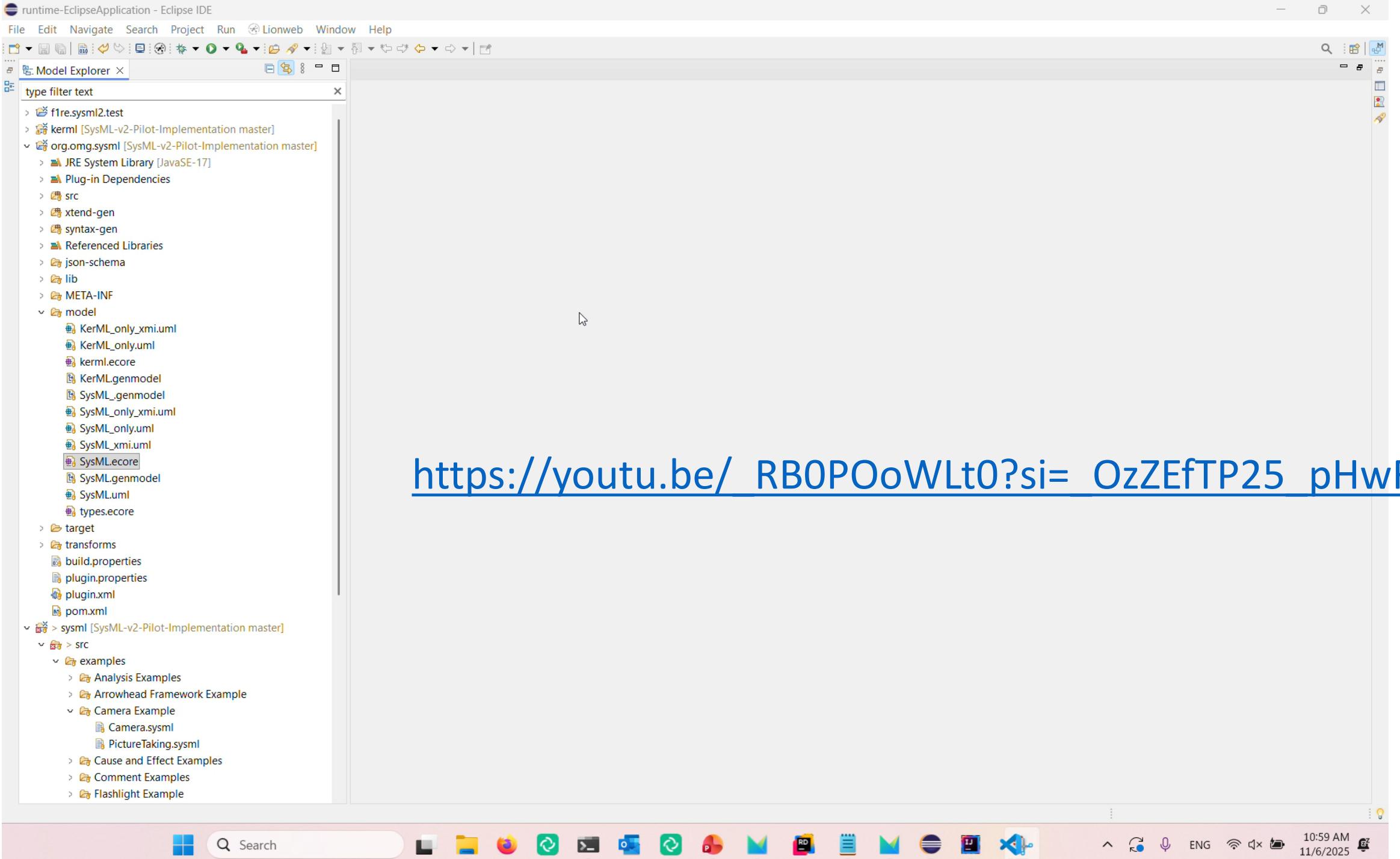


```
fun sumOf1ToN(n: number) =  $\sum_{i=1}^n i$ 
```

```
fun sumOf1ToNInduction(n: number)
=  $\frac{n * (n + 1)}{2}$ 
```

```
fun sumRealFn(a: int, b: real) =  $\sum_{idx=1}^a idx * b$ 
```

A screenshot of the MPS IDE interface. On the left, there is a tree view of "Actions/Events" and "Actions/Payments". The main area shows a statechart diagram for a "Jet-Mobile" device. The statechart includes states like "idle", "driving", "turnLeft", "lineLeft []", "goStraight", "lineRight []", and "turnCenter []". Transitions between states are triggered by events such as "Internet on button: 1", "Discount on button: 1", and "Summer discount on button: 1". On the right, a list of actions is displayed, categorized under "Actions/Events" and "Actions/Payments". Some actions include "BACK", "GENERAL", "GET\_INFO", "MENU", "OTHER", "BILLING\_RETENTION", "CABLE\_BILLING\_DEPT", "CABLE\_T/S\_BILLING\_DEPT", "INTERNET\_BILLING\_DEPT", "INTERNET\_T/S\_DEPT", "PAY\_BILL", "PHONE\_BILLING\_DEPT", "PHONE\_T/S\_BILLING\_DEPT", "SALES\_CZECH", "SALES\_ENGLISH", and "SALES\_GERMAN".



[https://youtu.be/\\_RBOPPOoWLt0?si=OzZEfTP25\\_pHwFo](https://youtu.be/_RBOPPOoWLt0?si=OzZEfTP25_pHwFo)



Search

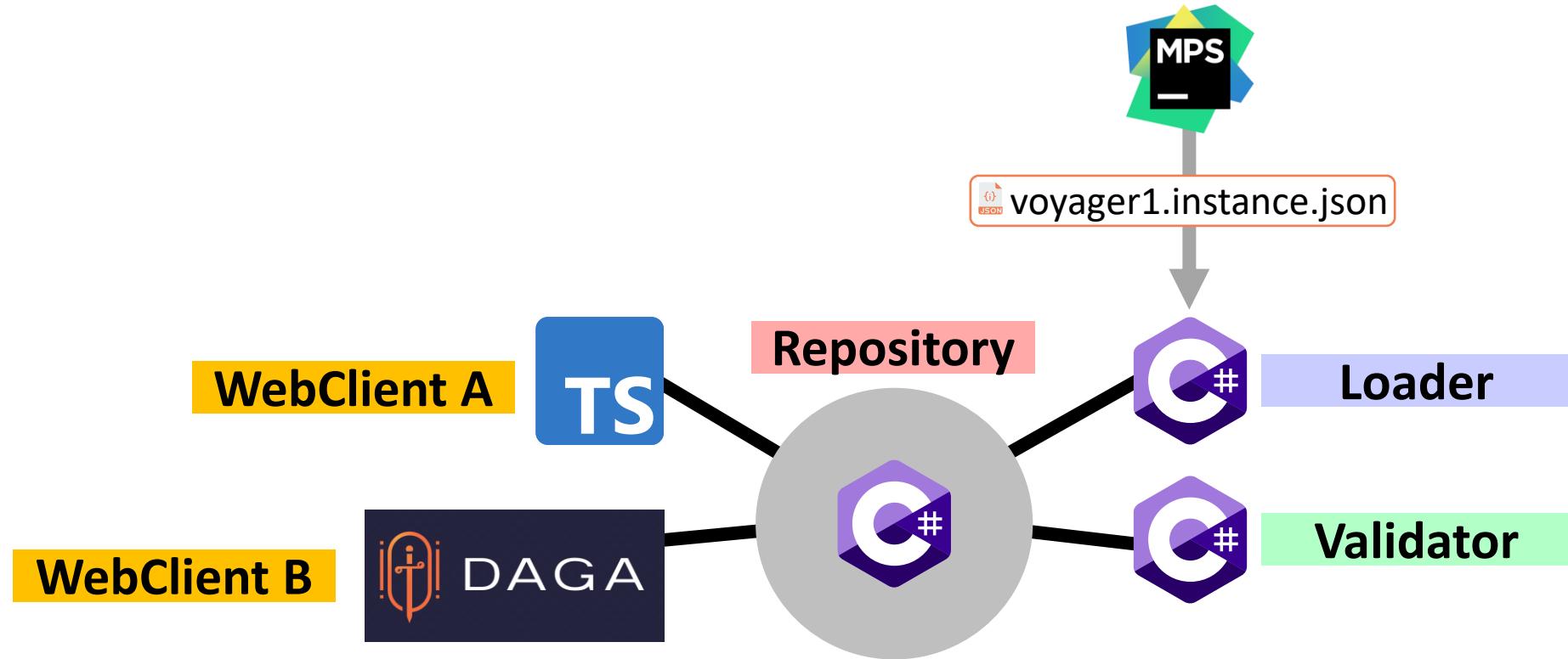


ENG



10:59 AM  
11/6/2025

# Demo 2



[https://youtu.be/inN9l8gKxSc?si=XF6\\_wkB4cvAHq2HN](https://youtu.be/inN9l8gKxSc?si=XF6_wkB4cvAHq2HN)

# Our work on LionWeb

## Apps

- [Repository](#)
- [Repository admin UI](#)

## Integrations

- [MPS](#)
- [Rascal](#)
- [Freon](#)
- [Modelix](#)
- [EMF](#)

## Libraries

- [C#](#)
- [Java](#)
- [Kotlin](#)
- [Python](#)
- [TypeScript](#)

## Specification documents (public)

- Specification documents hosted on GitHub:  
[github.com/LionWeb-io/specification](https://github.com/LionWeb-io/specification)

# How – Principles

## International consortium of developers

- With a long history in language engineering and modeling tools

## LionWeb as boring, reliable base

- Innovate on top

## Rough consensus & Running code

- No paperware

## Everything is a model

- Markus Voelter's [Whitepaper](#) “A Platform for Systems and Business Modeling”

## Business-friendly Open Source License

- Apache 2.0



# Interested in Integration

**Jetbrains WebMPS**

**Metadev Daga**

**ModelingValueGroup Dclare**

**TU Delft Spoofax**

**TypeFox Langium**

- <https://www.typefox.io/blog/lionweb-langium/>

**TypeFox Typir**

# What LionWeb solves

**Technical interoperability**

→ **LionWeb format and protocols**

**Identity**

→ **established by clients (tools)**

**Semantic mapping**

→ **fine-grained and use-case specific**

# Your feedback for us



# Team and Contact

## Team

<b>Meinte Boersma</b>	DSL Consultancy
<b>Erkan Diken</b>	FIRE
<b>Norman Koester</b>	itemis (Modelix)
<b>Sergej Koscejev</b>	Freelancer
<b>Sascha Lisson</b>	itemis (Modelix)
<b>Pedro Molina</b>	Metadev
<b>Eugen Schindler</b>	Canon Production Printing

<b>Alex Shatalin</b>	JetBrains (MPS)
<b>Niko Stotz</b>	FIRE
<b>Federico Tomassetti</b>	Strumenta
<b>Markus Voelter</b>	Freelancer
<b>Ulyana Tikhonova</b>	FIRE
<b>Jos Warmer</b>	Freelancer (Freon)

## Contact

**Want to work with us:**  
[info@lionweb.io](mailto:info@lionweb.io)

**GitHub:**  
<https://github.com/LionWeb-io>

**Web:**  
<https://lionweb.io/>

**Slack to follow us, use, or implement LionWeb:**  
[https://join.slack.com/t/lionweb/shared\\_invite/zt-2k1k5bsv7-EvC2IABlgSxWrqJNVOZ0HQ](https://join.slack.com/t/lionweb/shared_invite/zt-2k1k5bsv7-EvC2IABlgSxWrqJNVOZ0HQ)

