


Capella & SysON: The MBSE Force Awakens

Etienne Juliot

Seat Adjuster with Eclipse SDV

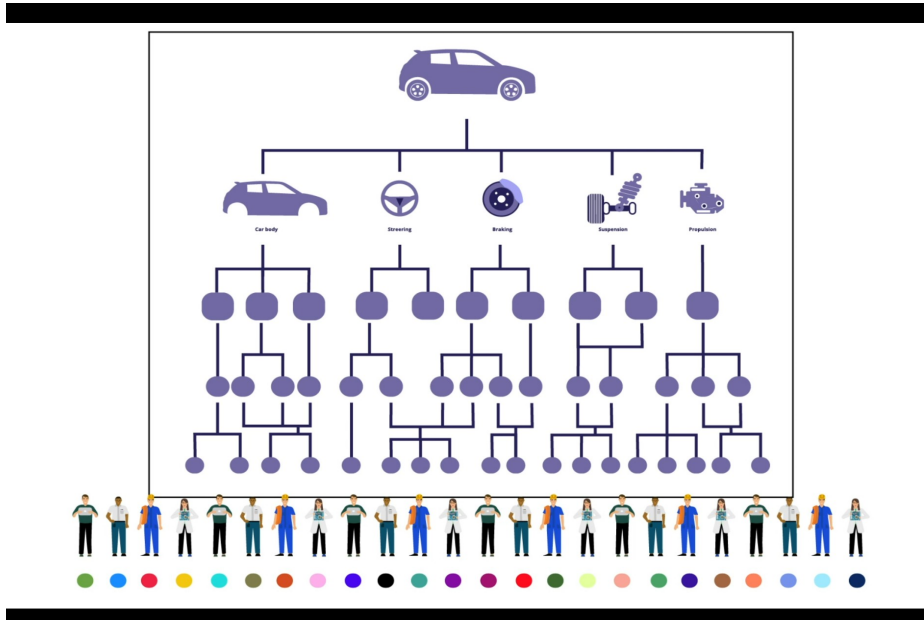
Modeling with Eclipse Capella & Eclipse SysON



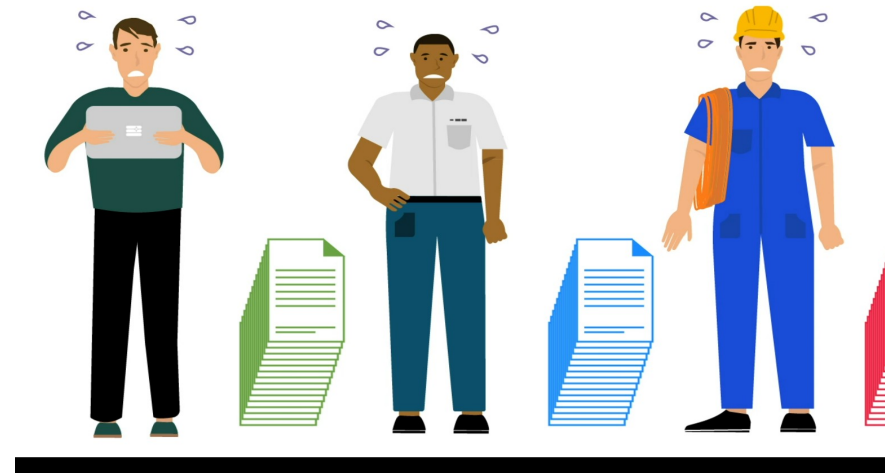


Model-Based
Systems Engineering

An approach to manage the complexity across disciplines (not only SW)

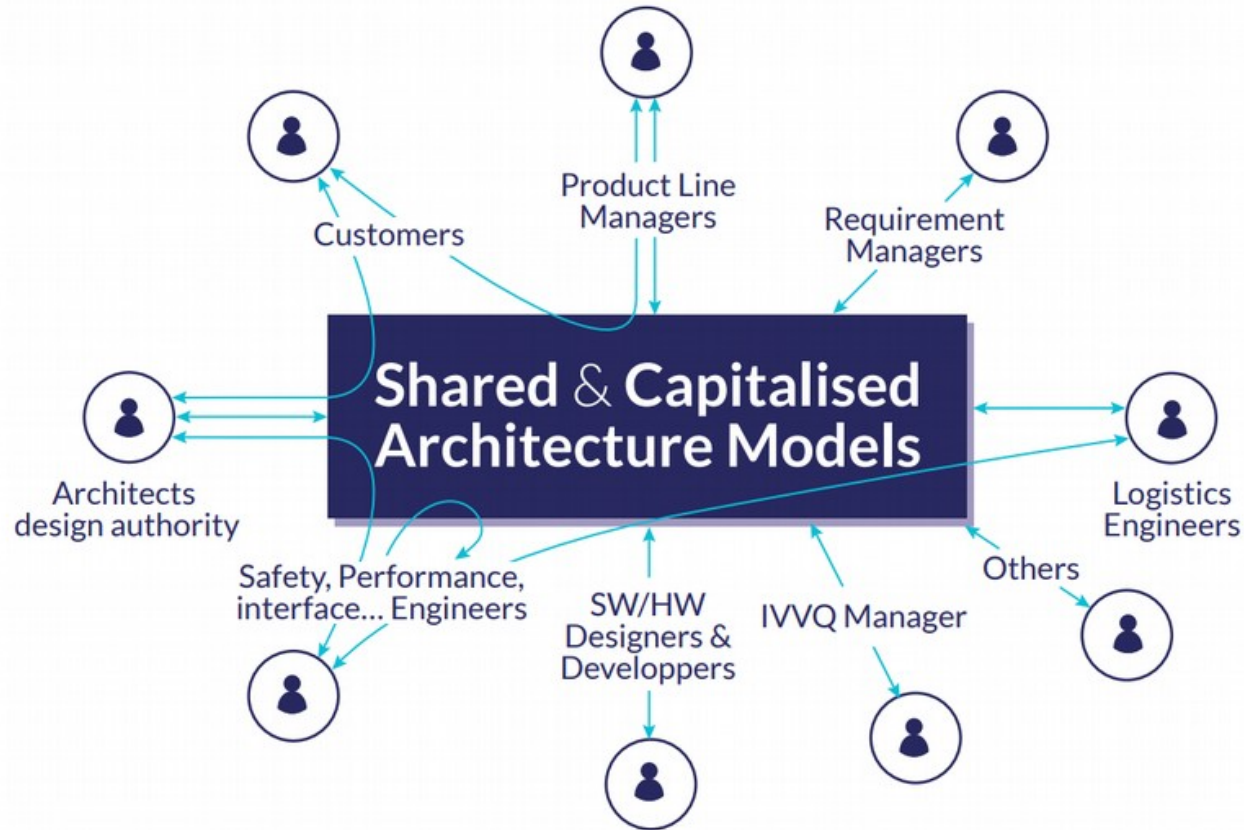


Numerous components and disciplines must collectively work to meet countless requirements



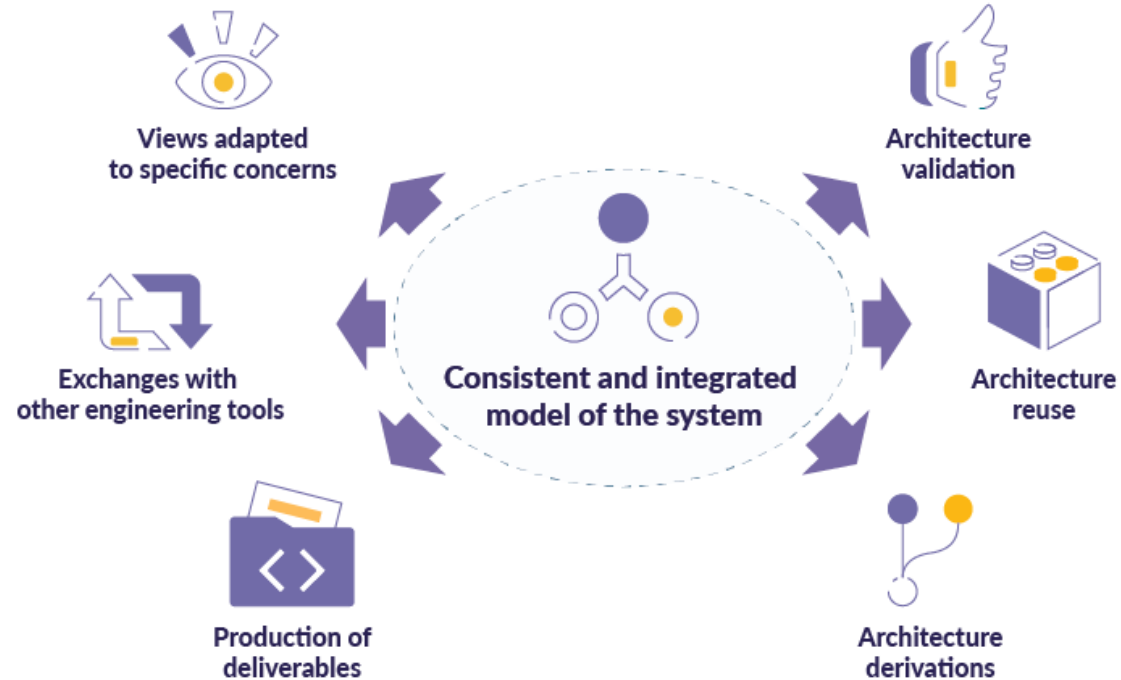
This complexity makes document-based system descriptions very hard to maintain

With MBSE, functions + components are central assets for SDV

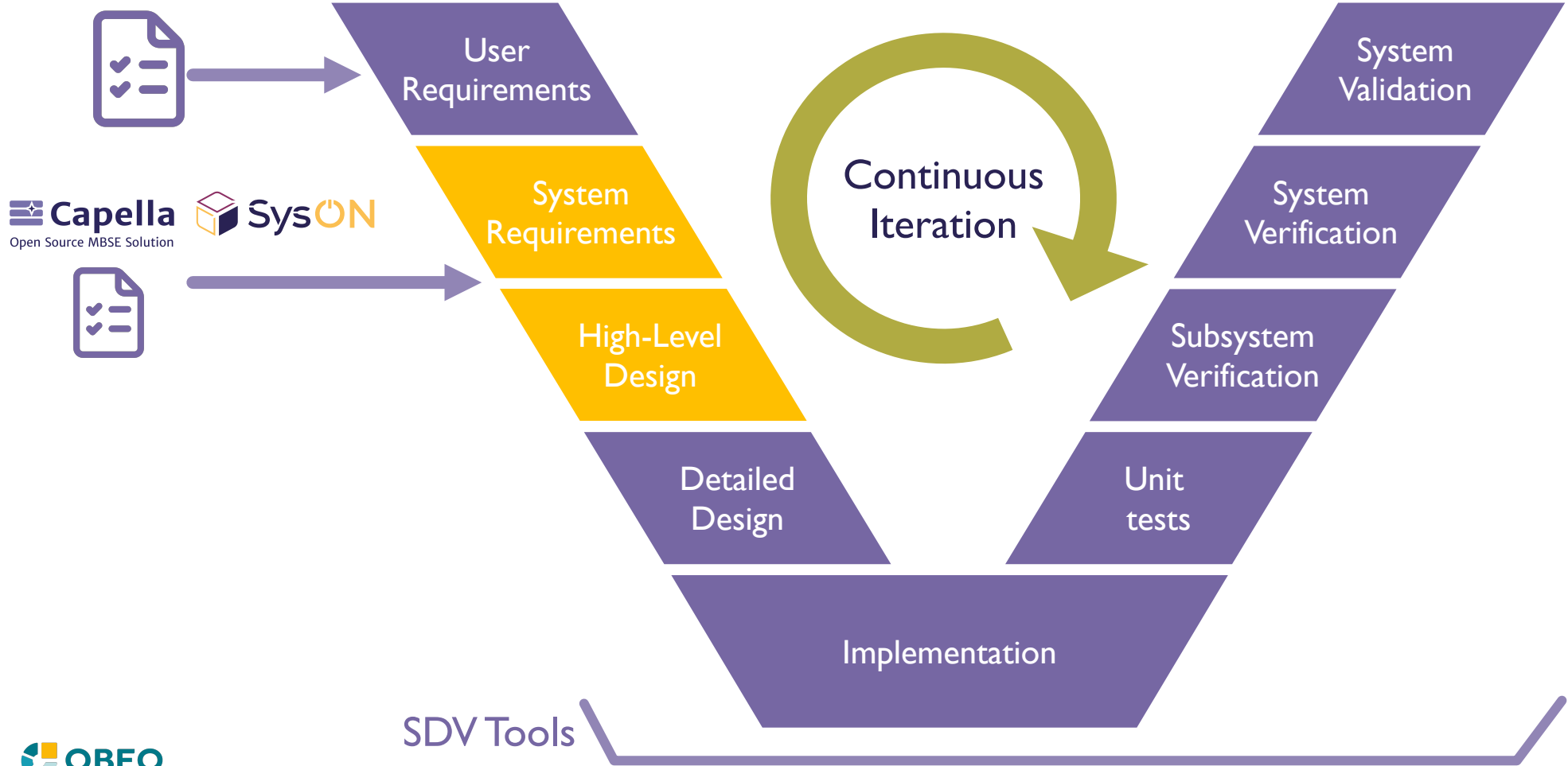


... while compatible with a code first approach

With MBSE, models are becoming central assets for SDV Architecture



A big picture of your system to support detailed design

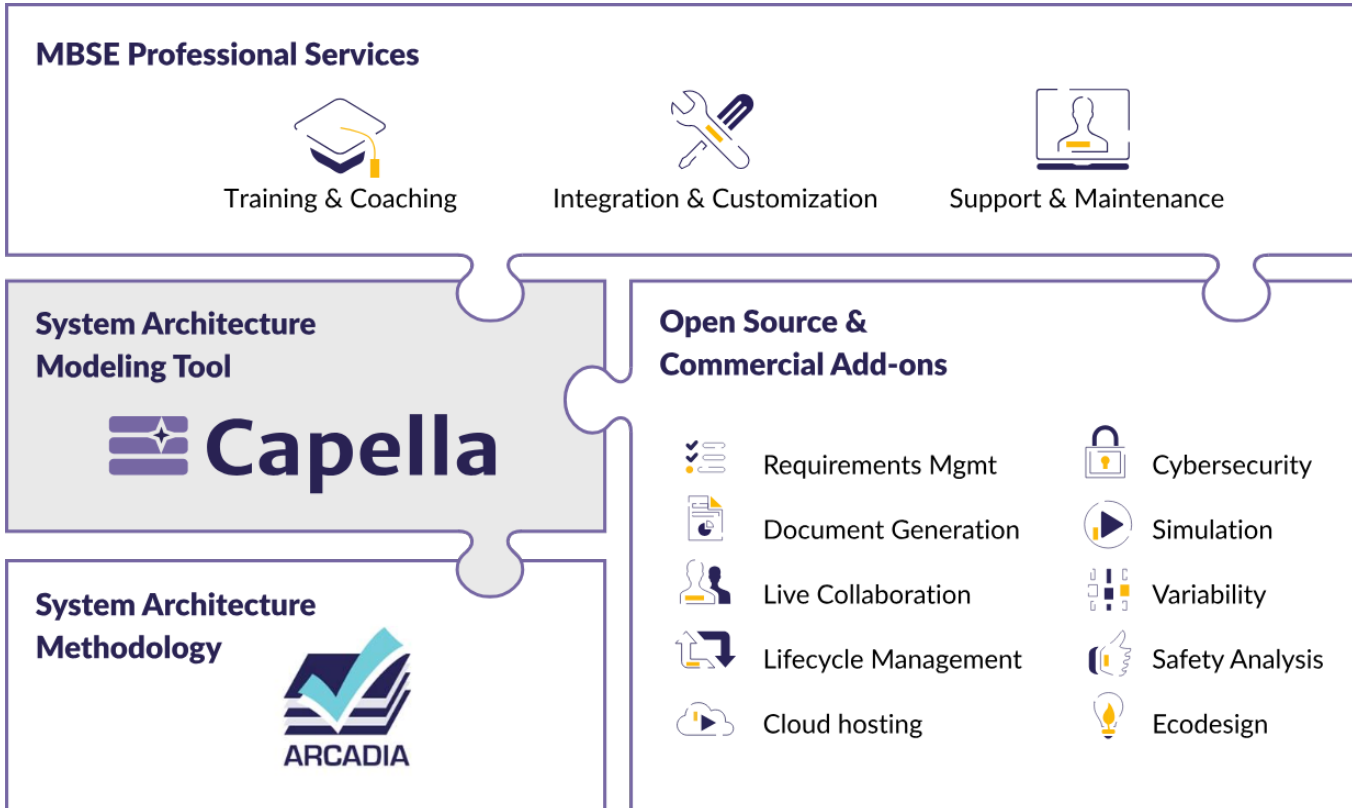


A decorative graphic consisting of two vertical lines of different lengths, one longer than the other, positioned in the upper left corner of the slide.

Capella

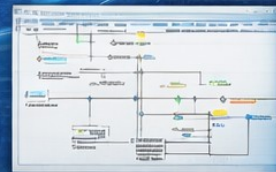
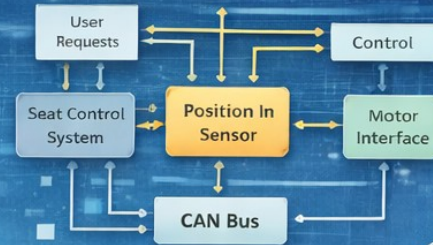
A comprehensive
MBSE solution

An industrial-grade MBSE Workbench

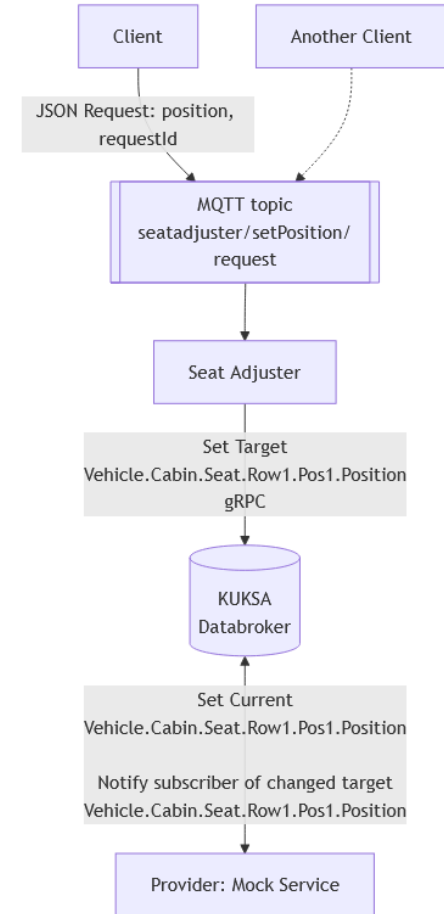
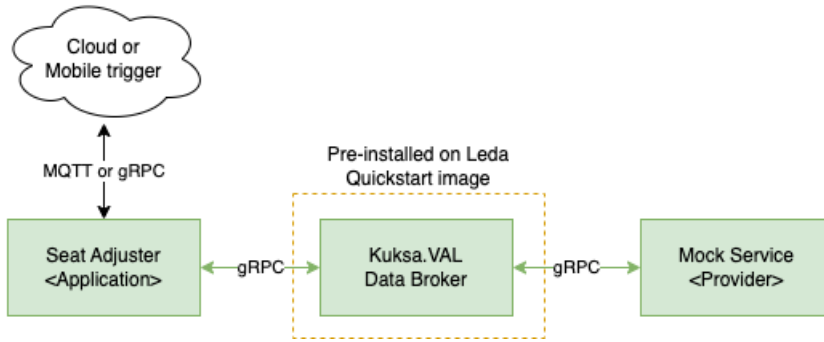


Seat Adjuster with Eclipse SDV

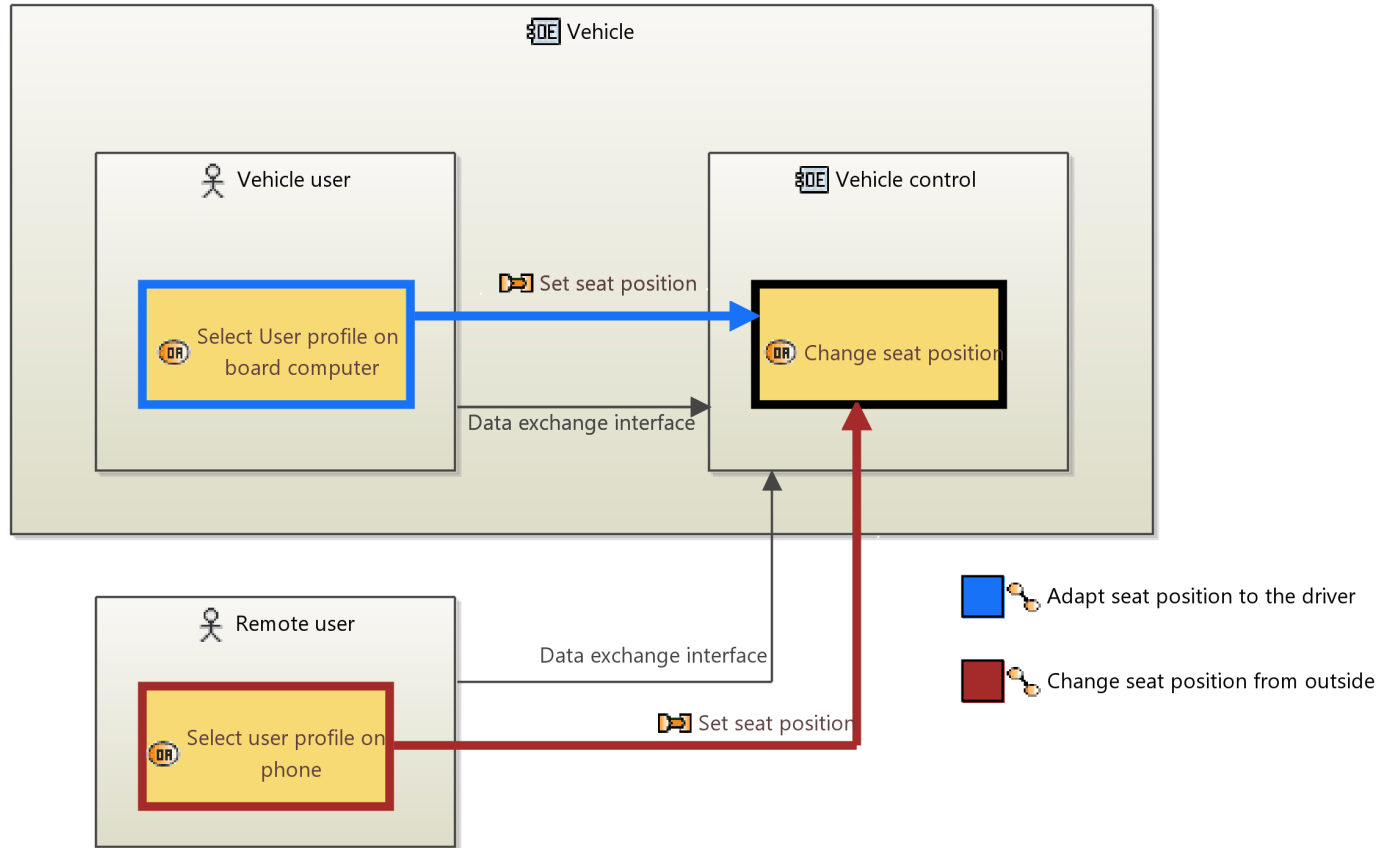
Modeling with Eclipse Capella & Eclipse SysON



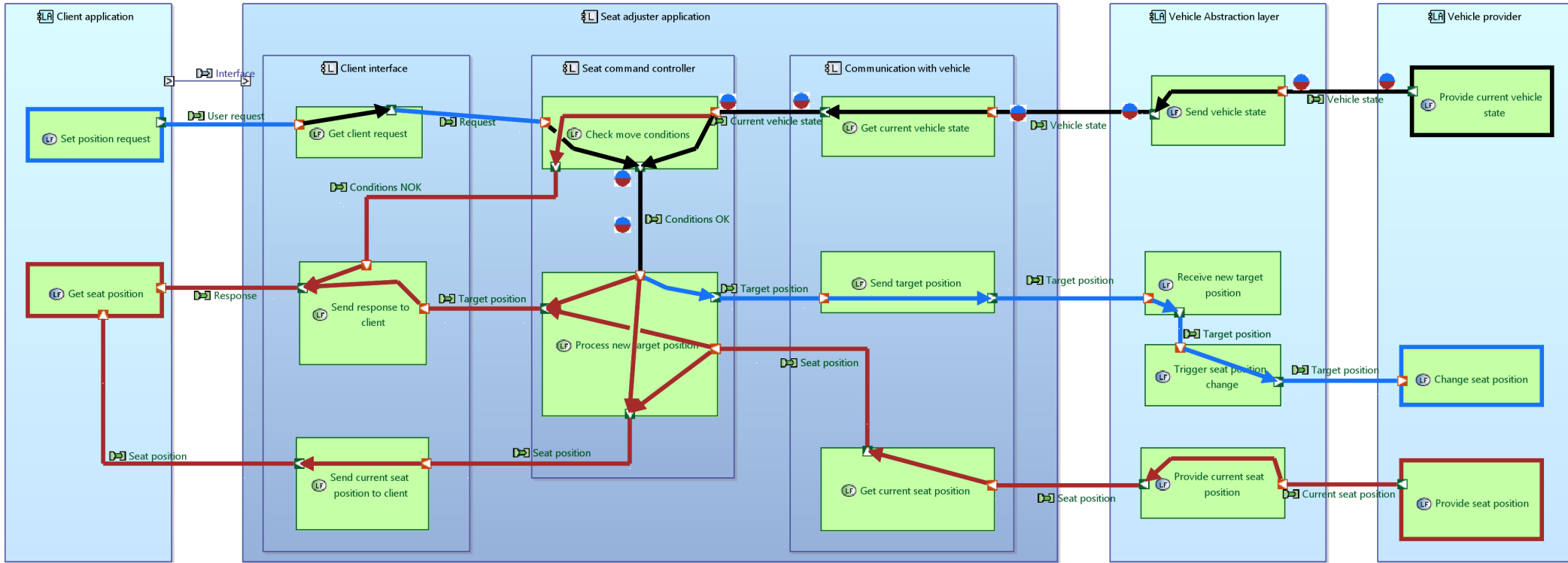
Reverse Engineering from existing detailed documentation



SDV Companion Application – Operational Analysis

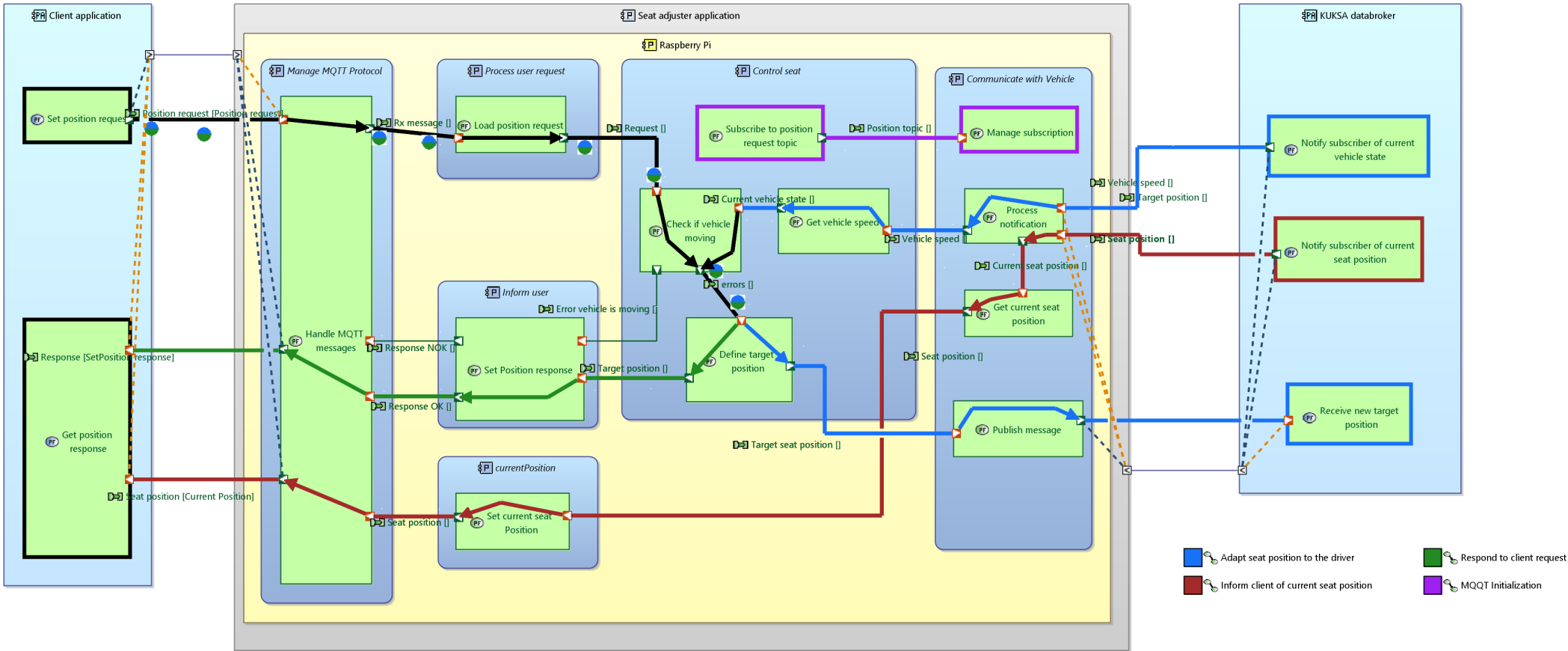


SDV Companion Application – Logical Architecture



- Adapt seat position to client request
- Inform client of response

SDV Companion Application – Physical Architecture



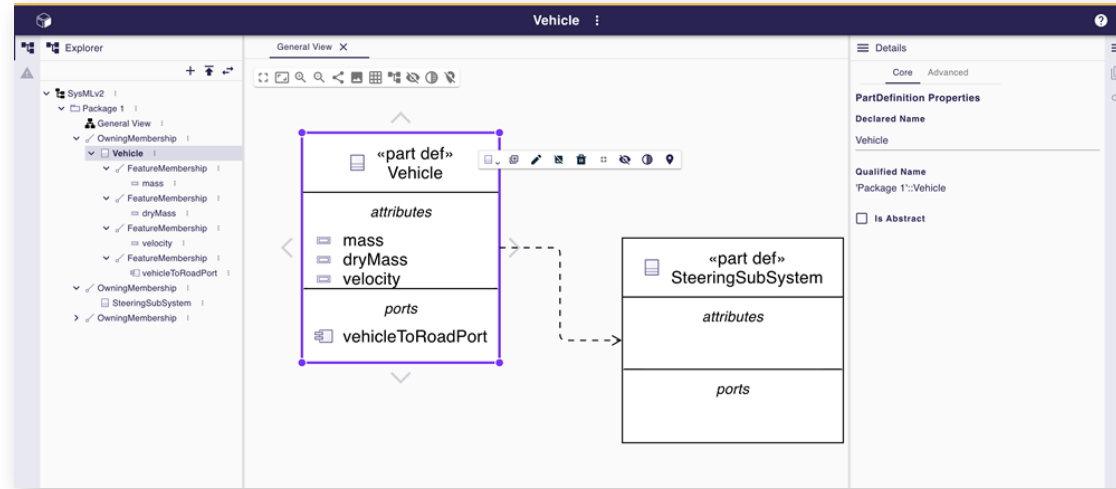


SysON

Open-source SysML V2
Modeling Tool



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



Flexible by Design

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

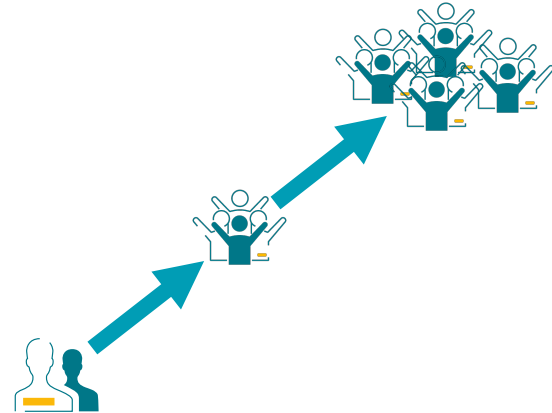
SysML V2 | Our vision



SysML v2 is a **key enabler** to enable Digital Engineering revolution:

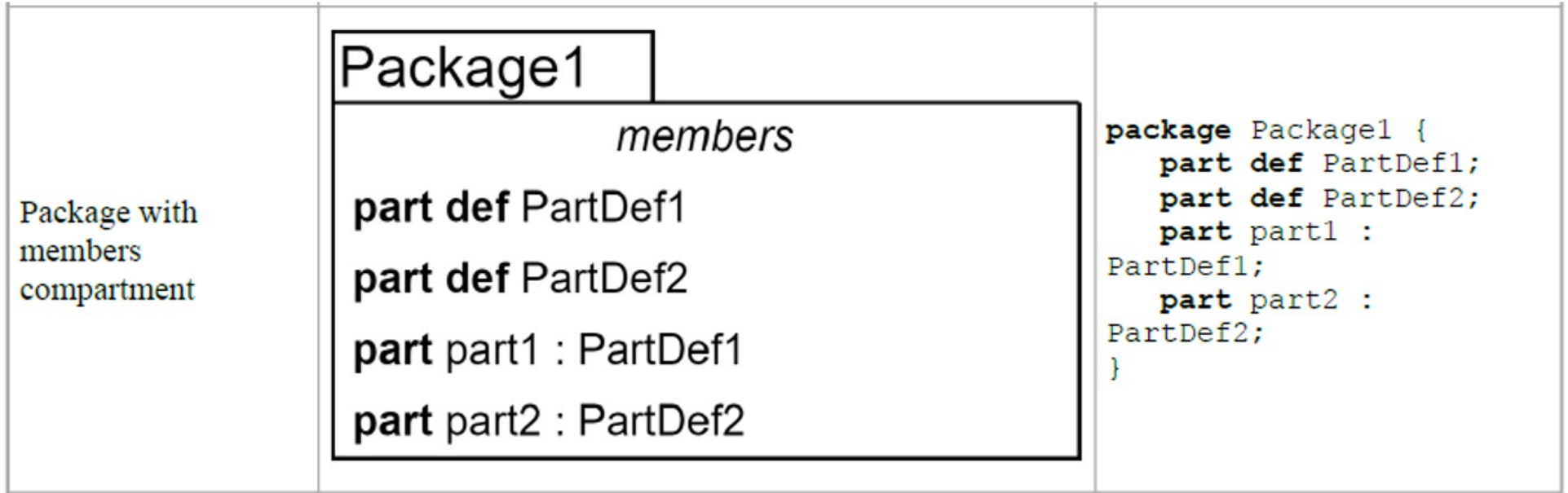
- Wide **Interoperability**
- Foundations for **formal verification** and **AI interactions**
- Foundation for building libraries of **domain specific ontologies**
- Foundation for supporting **MBSE processes**

Authoring a SysMLv2 model should be easily accessible to every Systems Engineers and beyond.



Obeo aims to pave the way for the SE industry by providing an open-source foundational authoring tool.

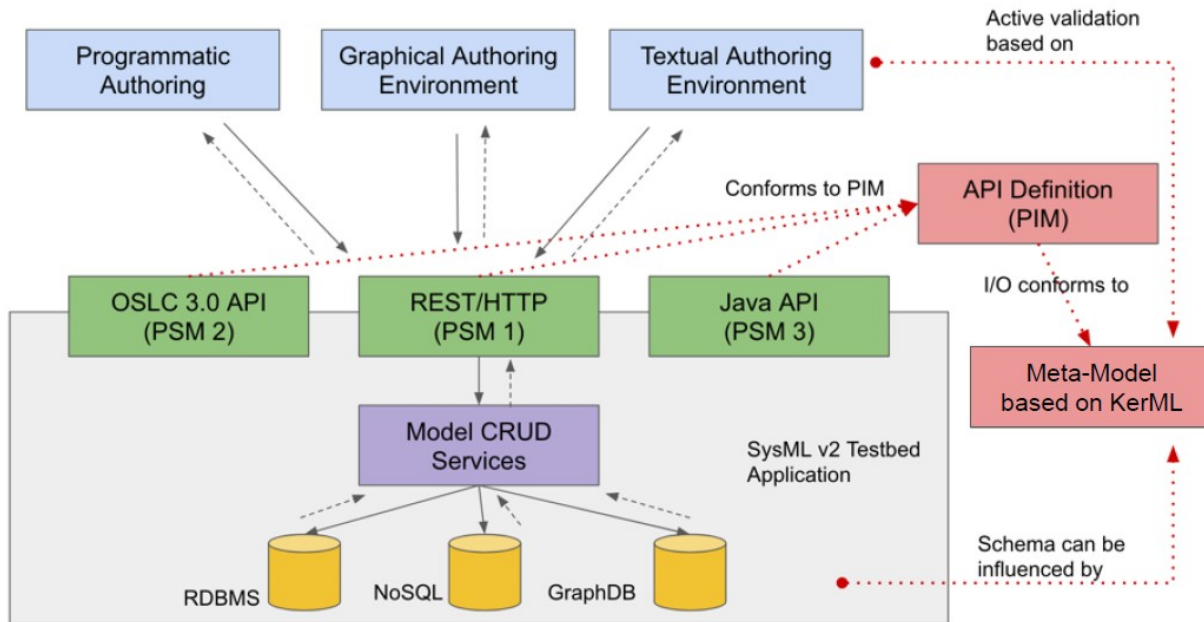
SysML V2 Main Evolutions | Textual and a Graphical notation



(valuable for code-first mindset engineers)

SysML V2 Main Evolutions | standardized API and services

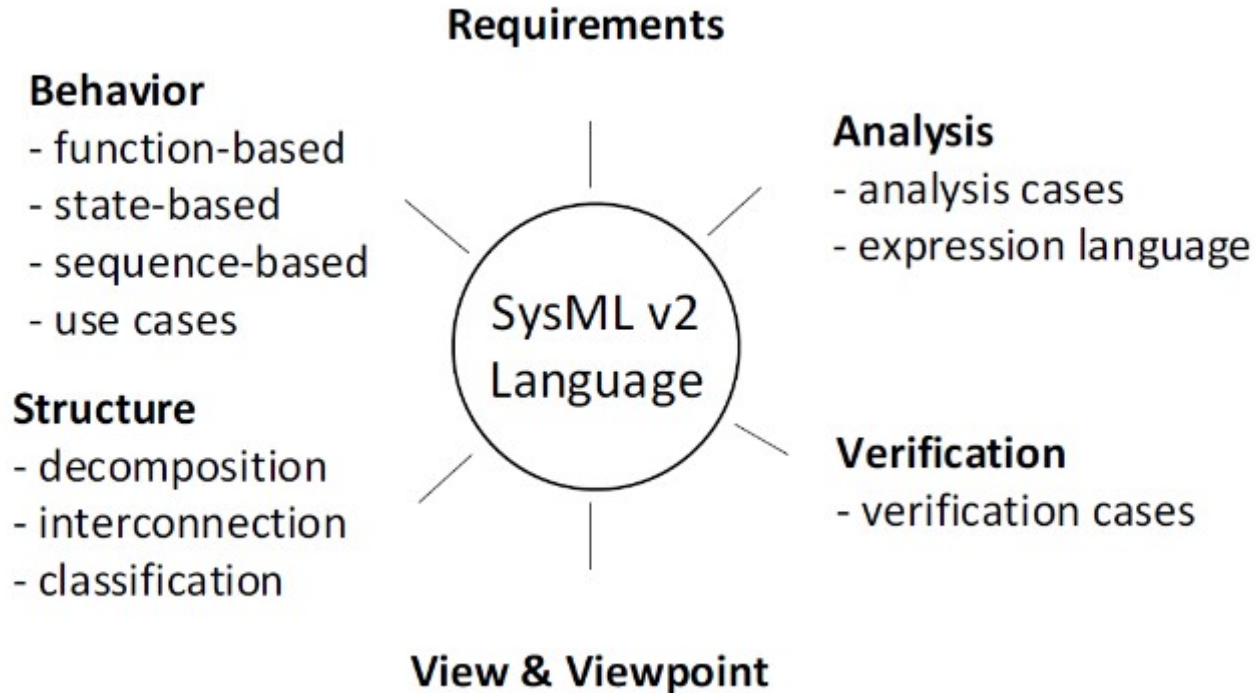
High-Level Architecture of SysML v2 Testbed



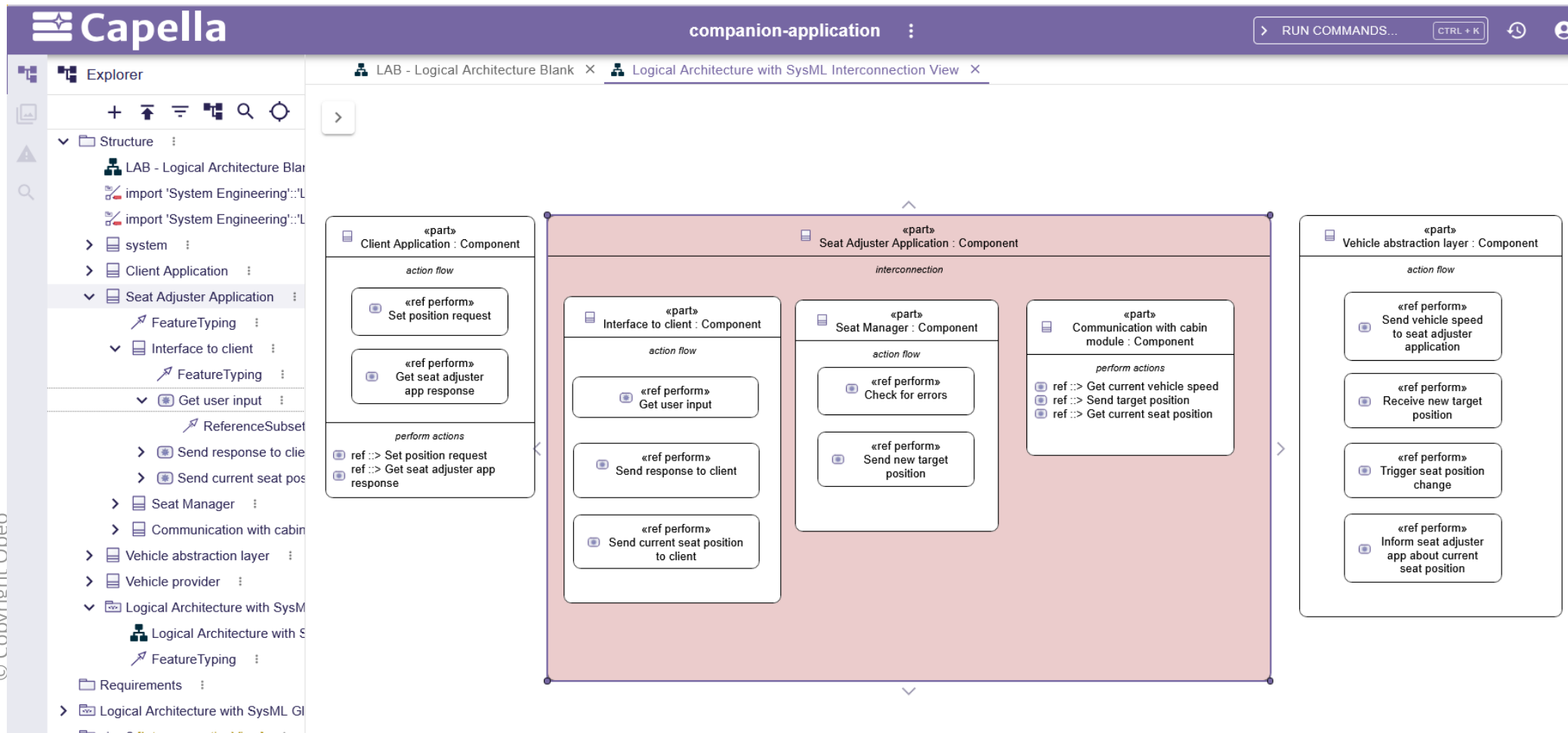
project-rest-controller ^

GET	/api/rest/projects/{projectId}	▼
PUT	/api/rest/projects/{projectId}	▼
DELETE	/api/rest/projects/{projectId}	▼
GET	/api/rest/projects	▼
POST	/api/rest/projects	▼

SysML V2 Main Evolutions | Language capabilities



SDV Companion Application – Logical Architecture



SDV Companion Application – Logical Architecture (simplified textual)

```
part 'Seat Adjuster Application' : Component {
  part 'Interface to client' : Component {
    perform action 'Get user input';
    perform action 'Send response to client';
    perform action 'Send current seat position to client';
  }

  part 'Seat Manager' : Component {
    perform action 'Check for errors';
    perform action 'Send new target position';
  }

  part 'Communication with cabin module' : Component {
    perform action 'Get current vehicle speed';
    perform action 'Send target position';
    perform action 'Get current seat position';
  }
}
```



SysON and Capella


Obeo Strategy | Combining the strengths of SysMLv2 and Capella



- ✓ Well defined Semantic to ease simulation
- ✓ Focus on interoperability
- ✓ Good extensibility
- ✓ Trigger significant interest

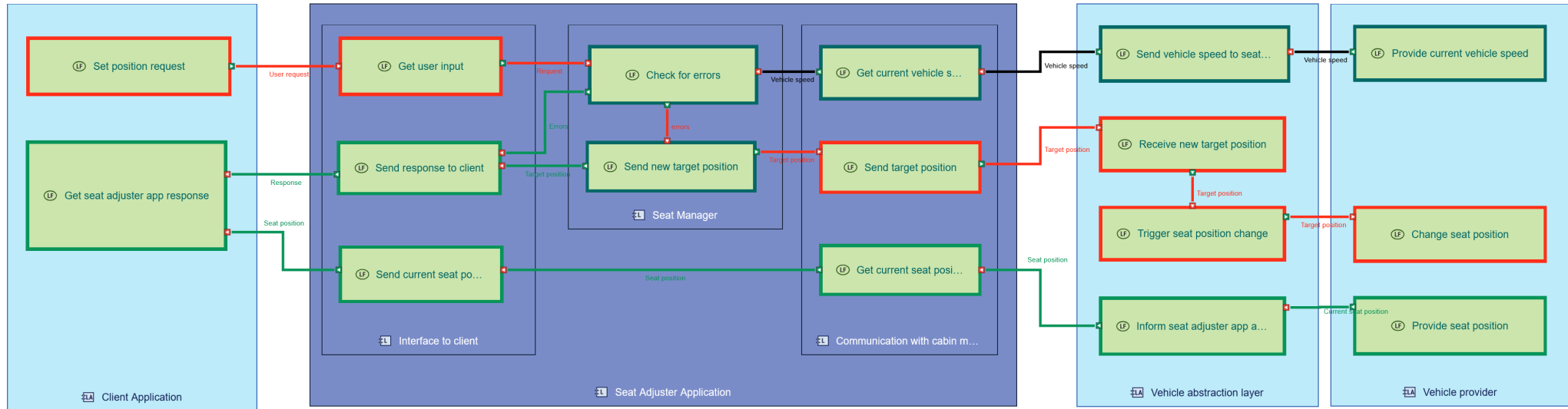


- ✓ Methodological guidance
- ✓ Simple to ramp-up
- ✓ Mature & field proven
- ✓ Wide & Growing adoption



**Deliver a comprehensive
Capella + SysMLv2 experience
that combines the strengths of both**

SDV Companion Application – Logical Architecture



SDV Sample at: <https://github.com/eclipse-sdv-blueprints/companion-application>

