



Atsen 2014

MDSD 2.0

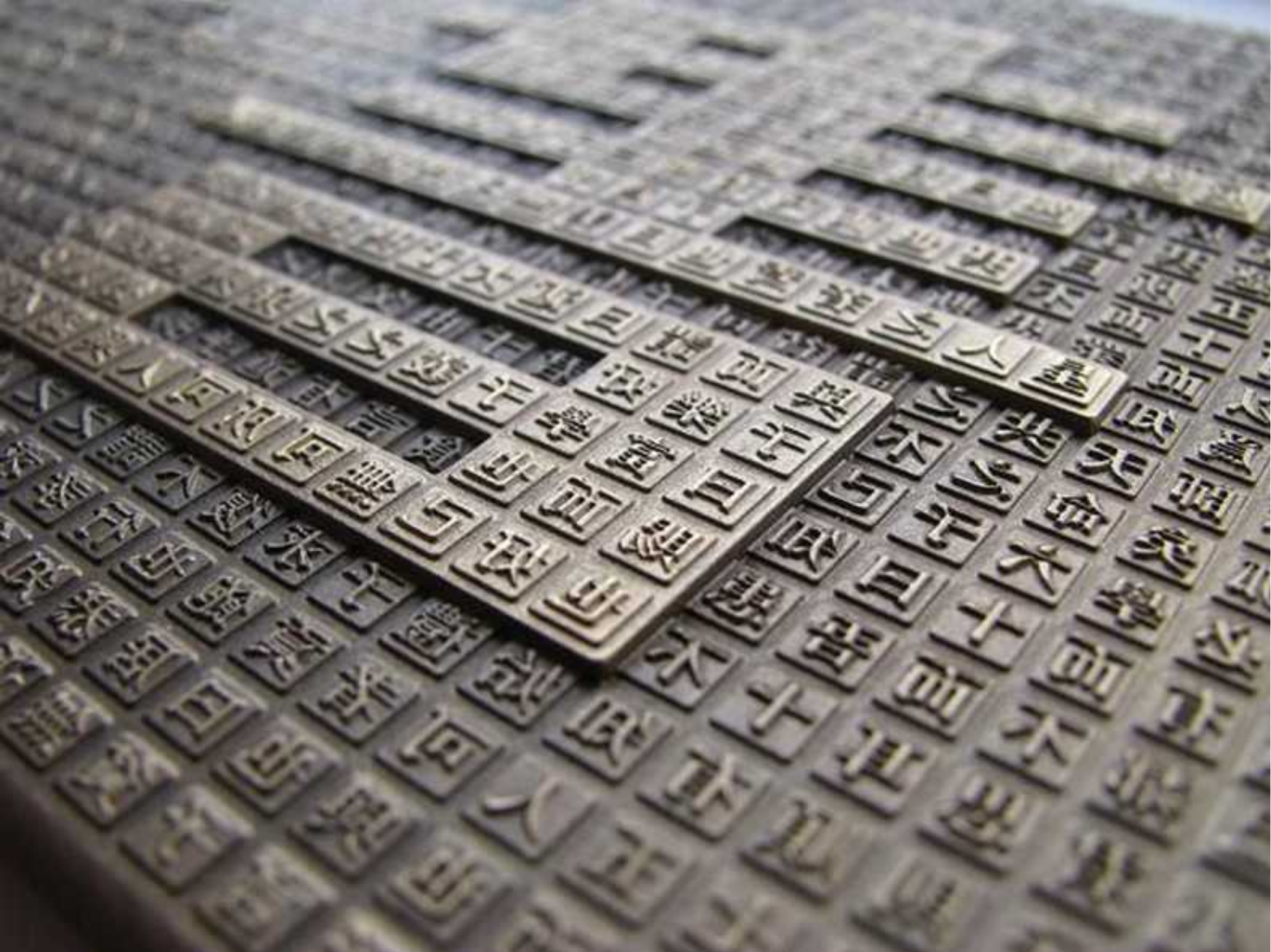
By Etienne Juliot
etienne.juliot@obeo.fr
#ejuliot

A close-up, artistic photograph of a mechanical watch movement. The watch has a white dial with the word 'CHANGES' printed in large, bold, black capital letters. A red second hand is visible, pointing towards the top right. The watch is set against a dark, textured background. The text 'Greatest Innovations' is overlaid in the top left corner.

**Greatest
Innovations**

**are General Purpose
Infrastructures**















Models

UML

BPMN

SYSML

BPEL

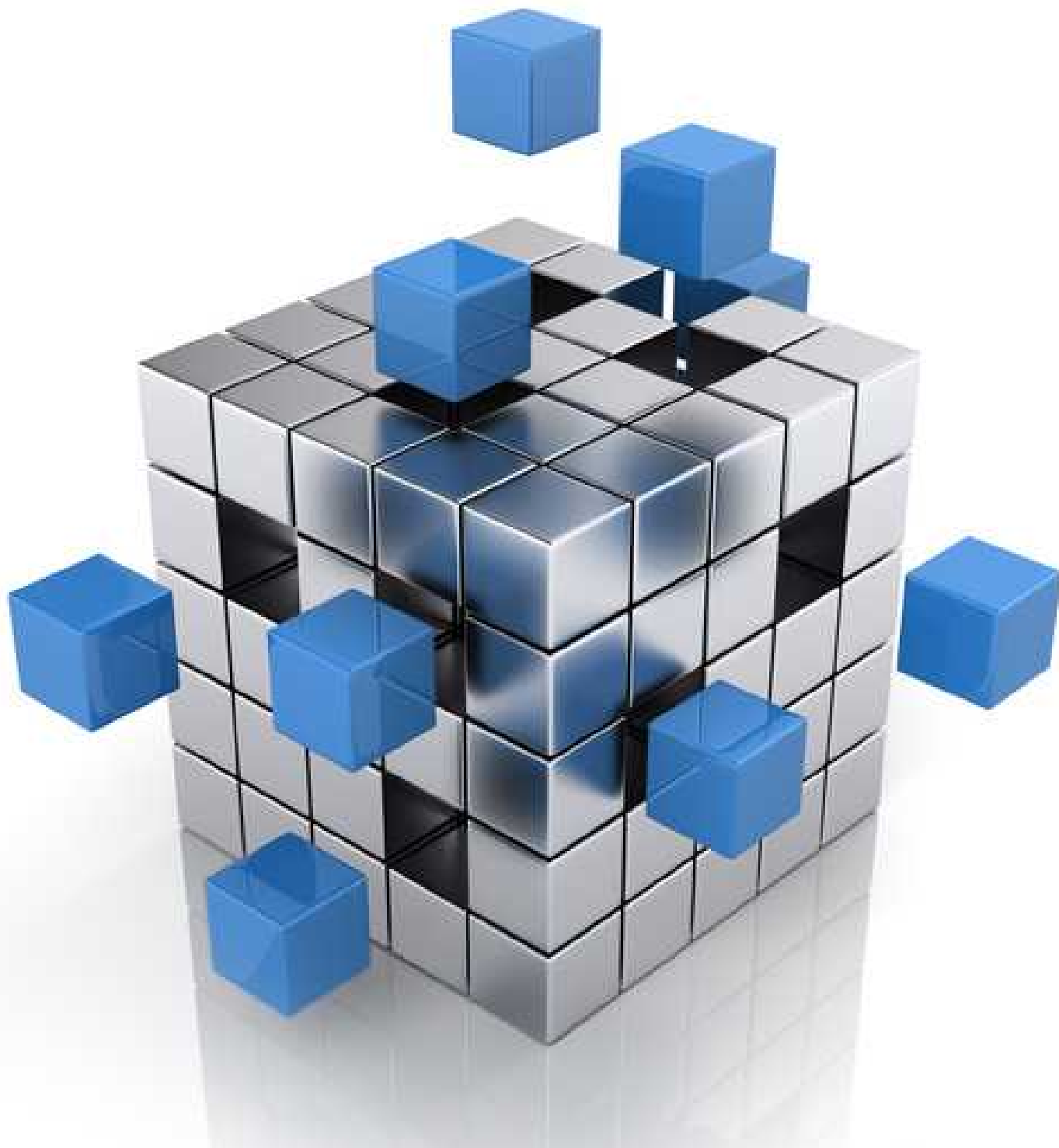
SCA

Autosar

SADT

STOOD

StateChart

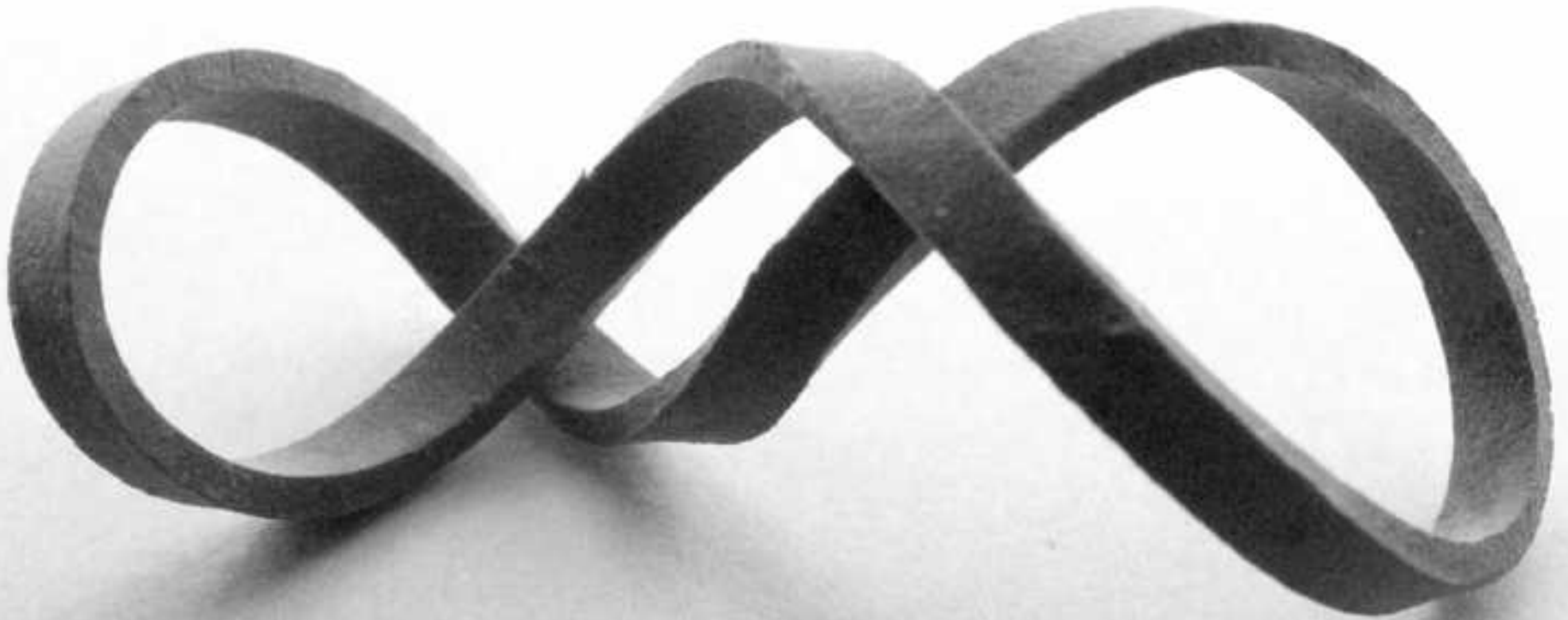




Diversity



Flexibility





Tools which create Tools

Customized Domain Model

A close-up photograph of a slide rule, a mechanical analog computer. The device features multiple scales with numbers and red markings. A sliding window is visible, showing a specific value. The background is dark and textured.

More precise and
easier to leverage

A close-up, artistic photograph of an hourglass. The top bulb is filled with dark, fine-grained sand, while the bottom bulb is mostly empty, showing the clear glass. The hourglass is held by a dark, thin frame. The background is a warm, out-of-focus brown. The text is overlaid on the right side of the image.

Customized Code Generators

**More efficient and
easier to maintain**

Customized Visual Editors

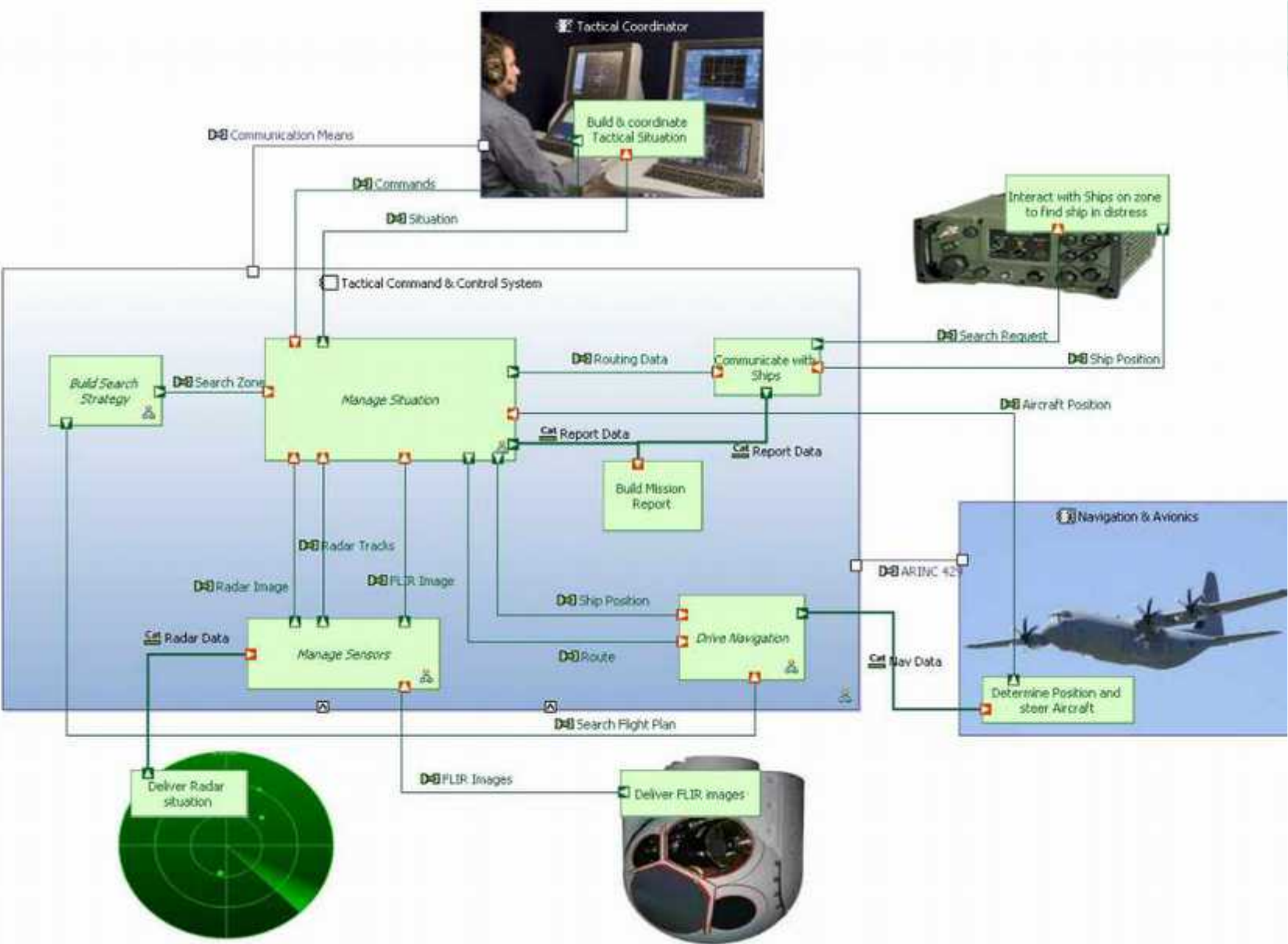


More
understandable

***Make me
a draw***







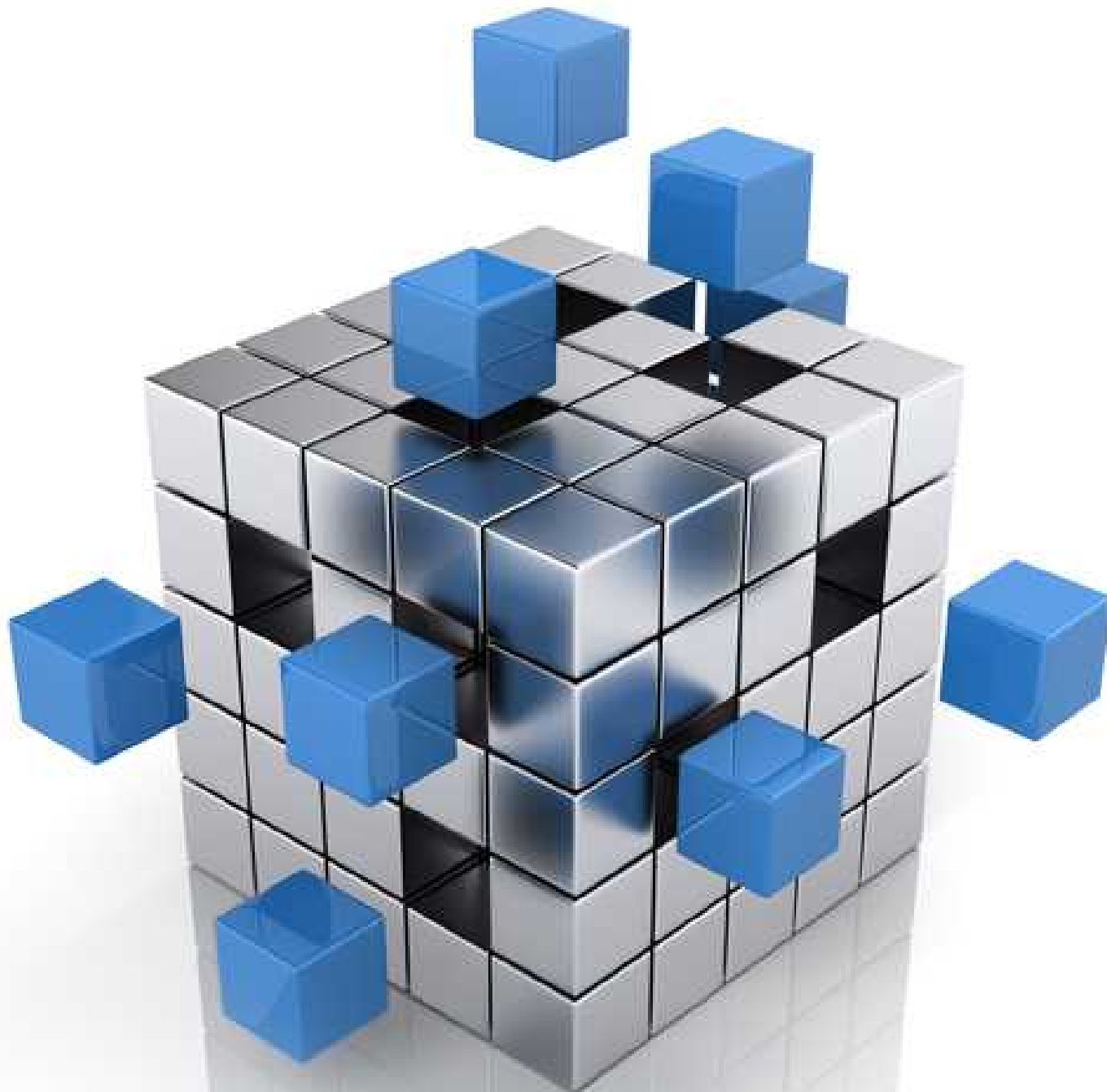




It is a steak

It is a sausage

Viewpoint



MDSD 2.0



Diversity ?





collaboration
is everything



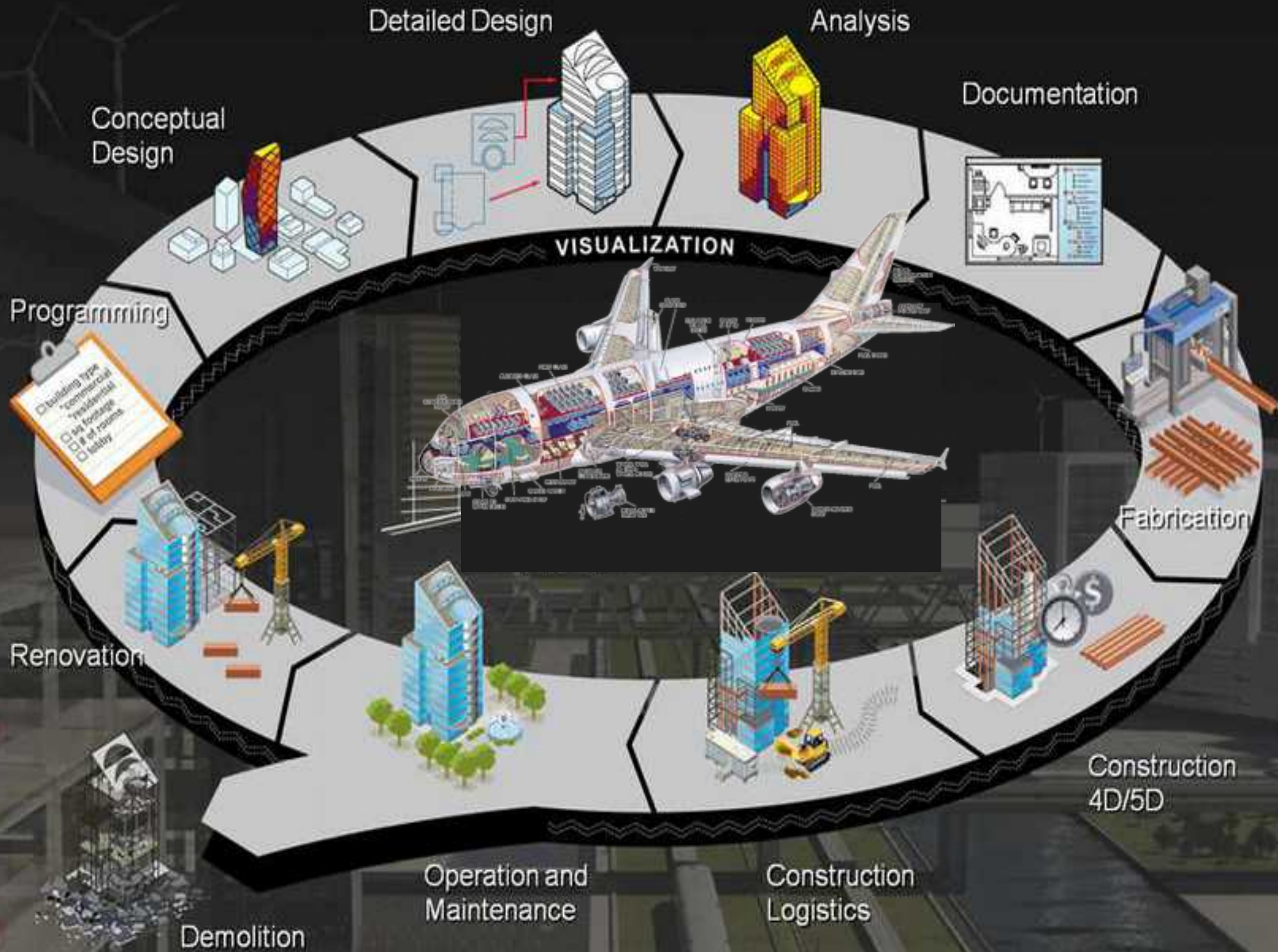


Sirius

System Engineering

eclipse.org/sirius

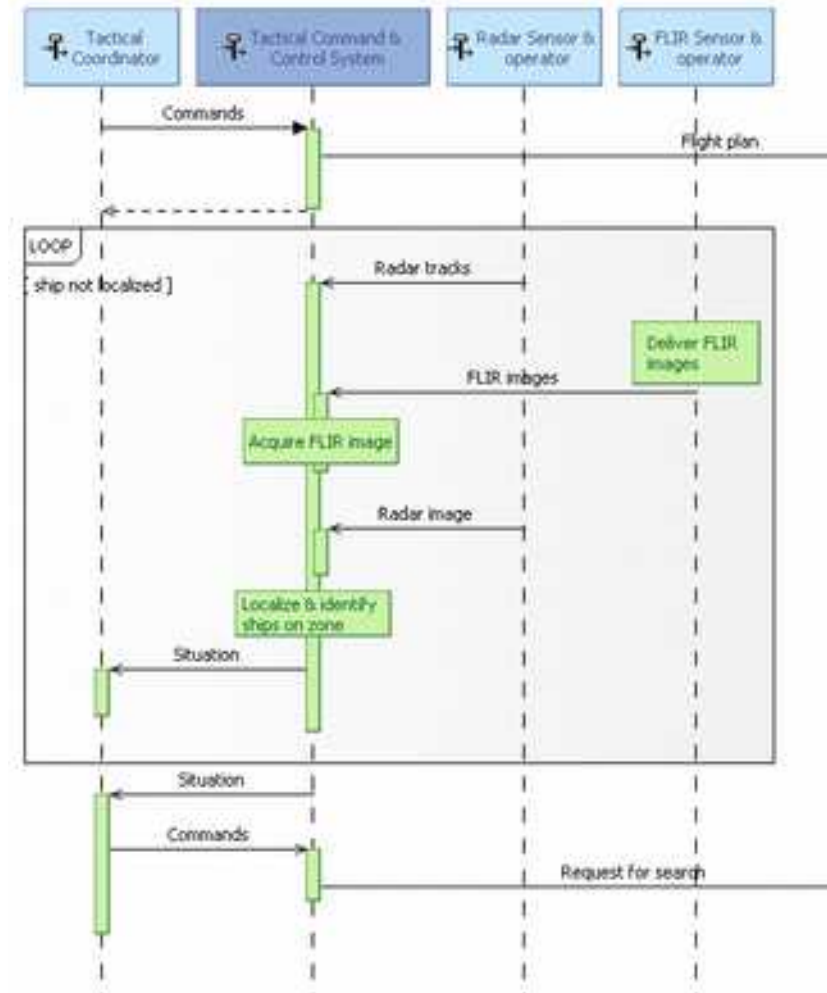
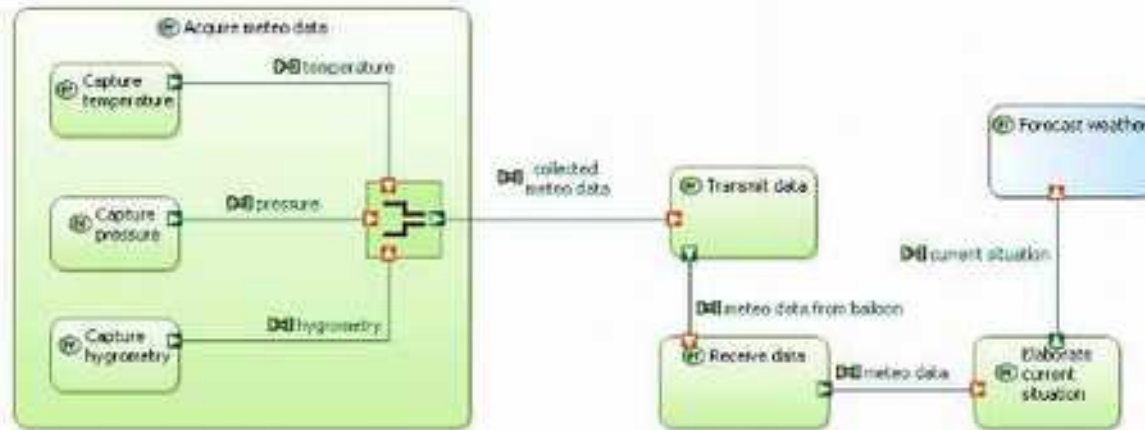






Iron Bird





Operational Analysis Model

What the users of the system need to accomplish

System Functional and Non-Functional Need Model

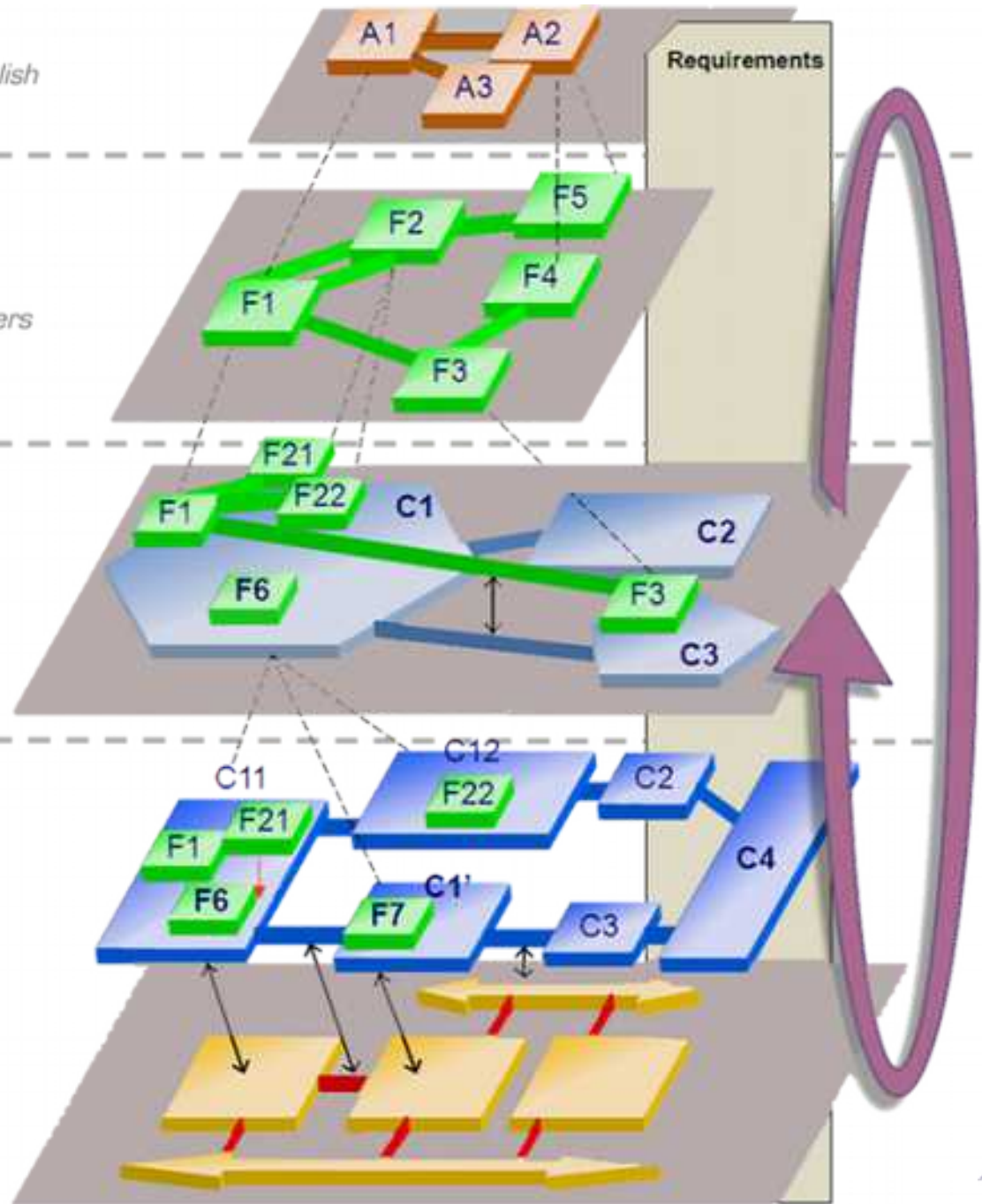
What the system has to accomplish for the users

Logical Architecture Model

*How the system will work
in order to fulfil expectations*

Physical Architecture Model & Product Breakdown

How the system be developed and built



System Analysis ▾

Operational
Analysis

System Analysis

Formalize System Requirements

Logical
Architecture

▶ Transition From Operational Activities



▶ Define Actors, Missions and Capabilities



▾ Refine System Functions, describe Functional Exchanges



[\[SFBD\] Create a new Functional Breakdown diagram](#)



[\[SDFB\] Create a new Functional Dataflow Blank diagram](#)



[\[FS\] Create a new Functional Scenario](#)

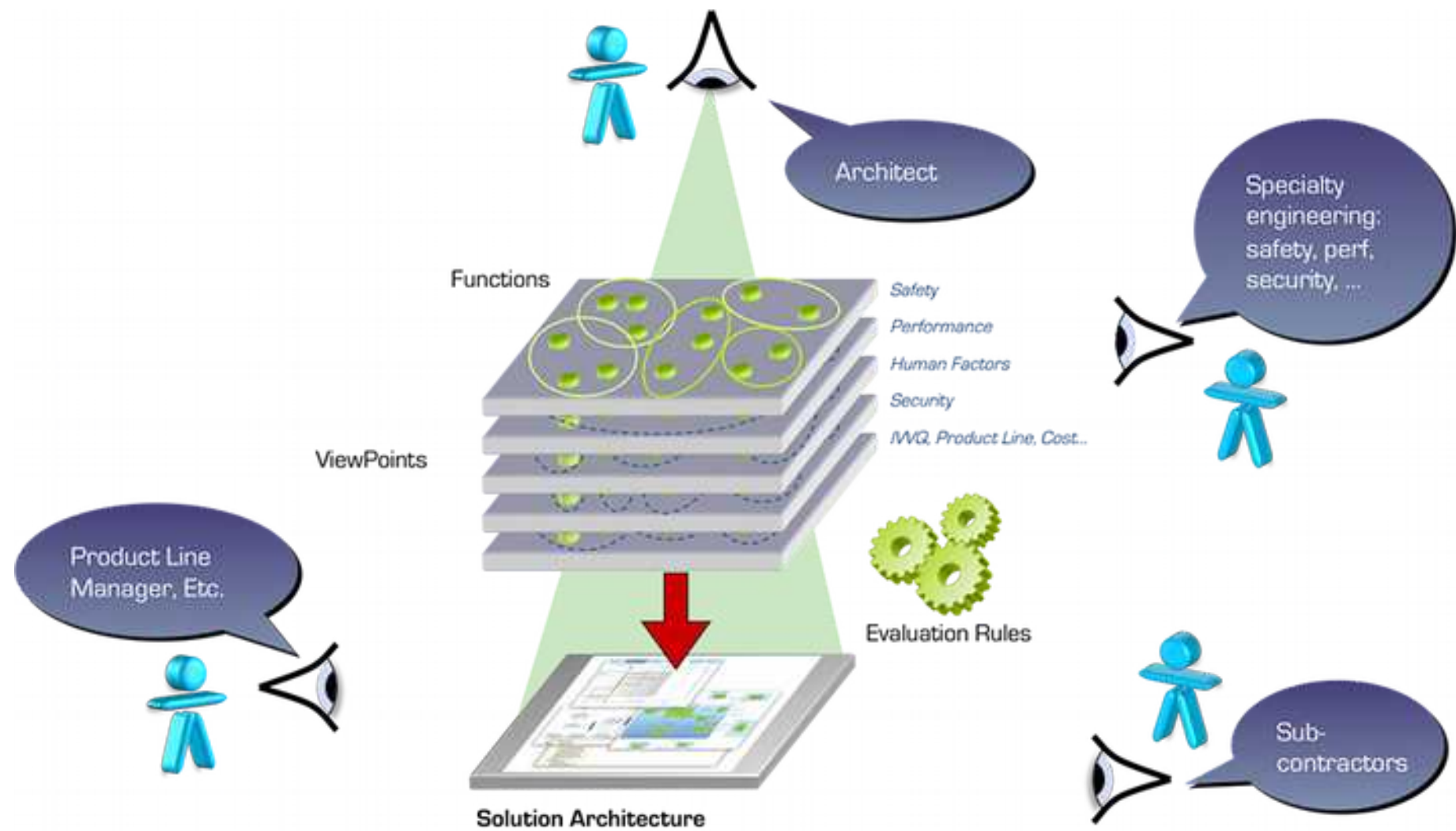
Diagrams Viewer

Select a name to find
? = any character, * = any string

type filter text.

- Common
 - Class Diagram Blank
 - Exchange Scenario
 - Functional Chain Description
 - Function Scenario
 - Modes and States
- System Analysis
 - Contextual Mission
 - Contextual System Actors
 - Missions Blank
 - Missions Capabilities Blank
 - System Actors - Operational Actors
 - System Architecture Blank
 - System Data Flow Blank
 - System Function Breakdown
 - System Functions - Operational Act







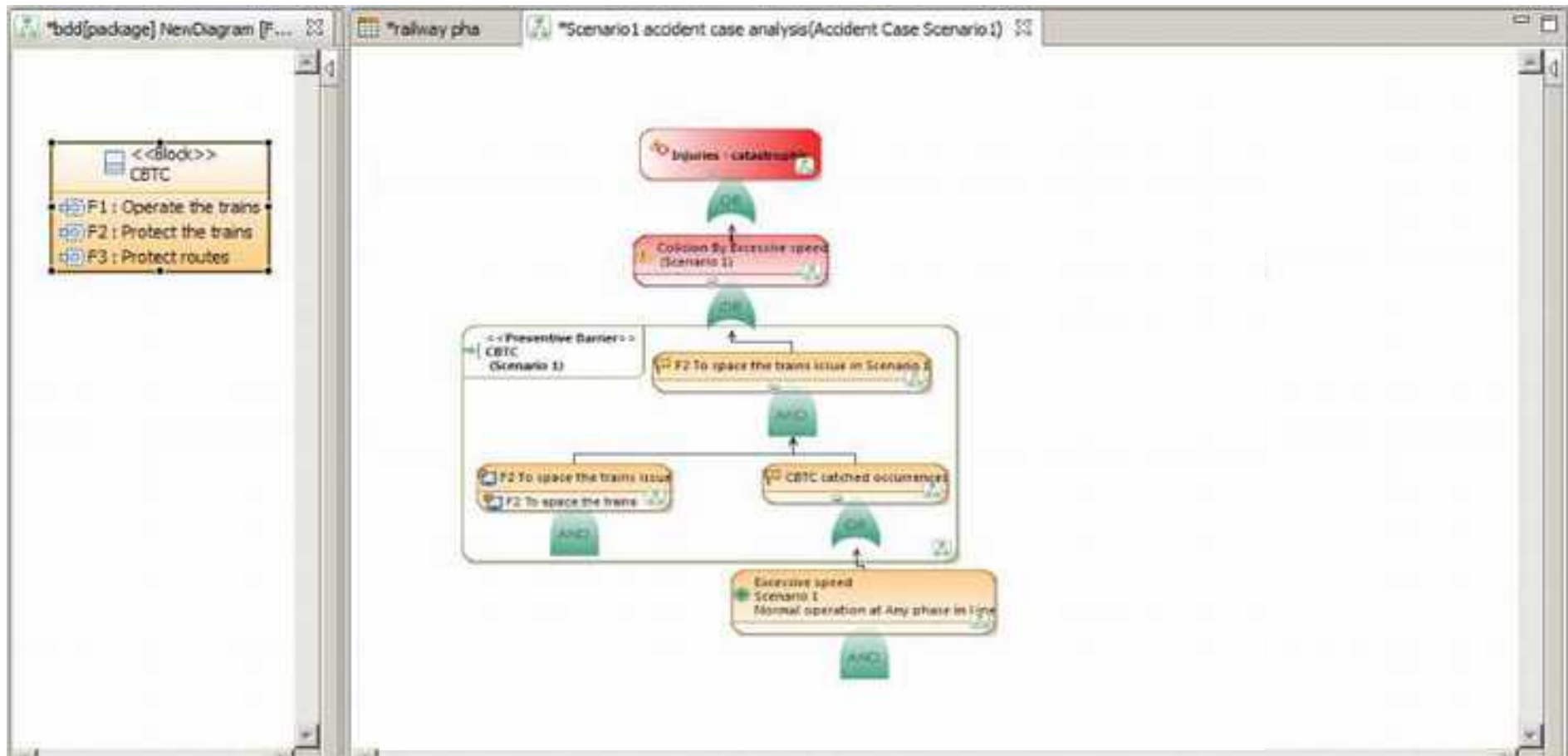
Heterogenous Parts





Capella

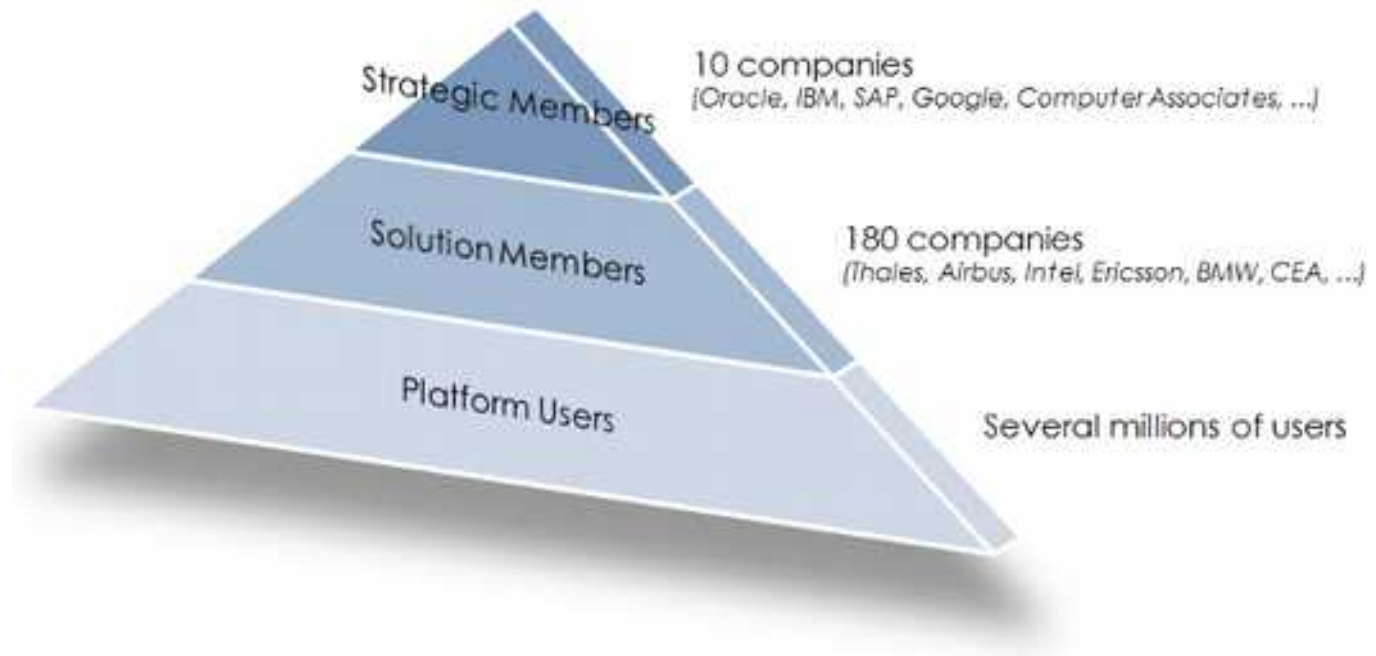




Leadership of Eclipse



- Sustainability
- Dissemination
- Excellence



EcoreTools



ATLO





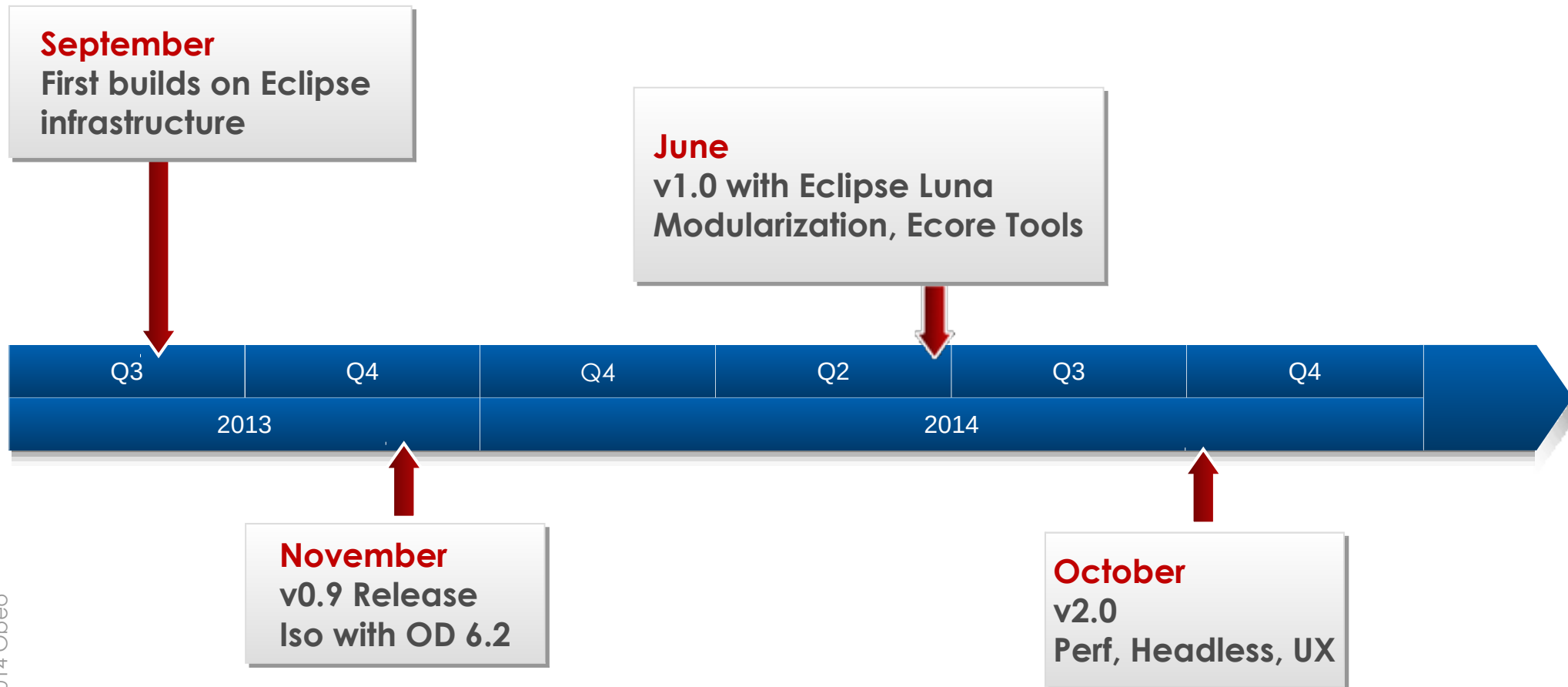
Sirius

The OpenSource project

eclipse.org/sirius



Sirius Roadmap



[illegible]

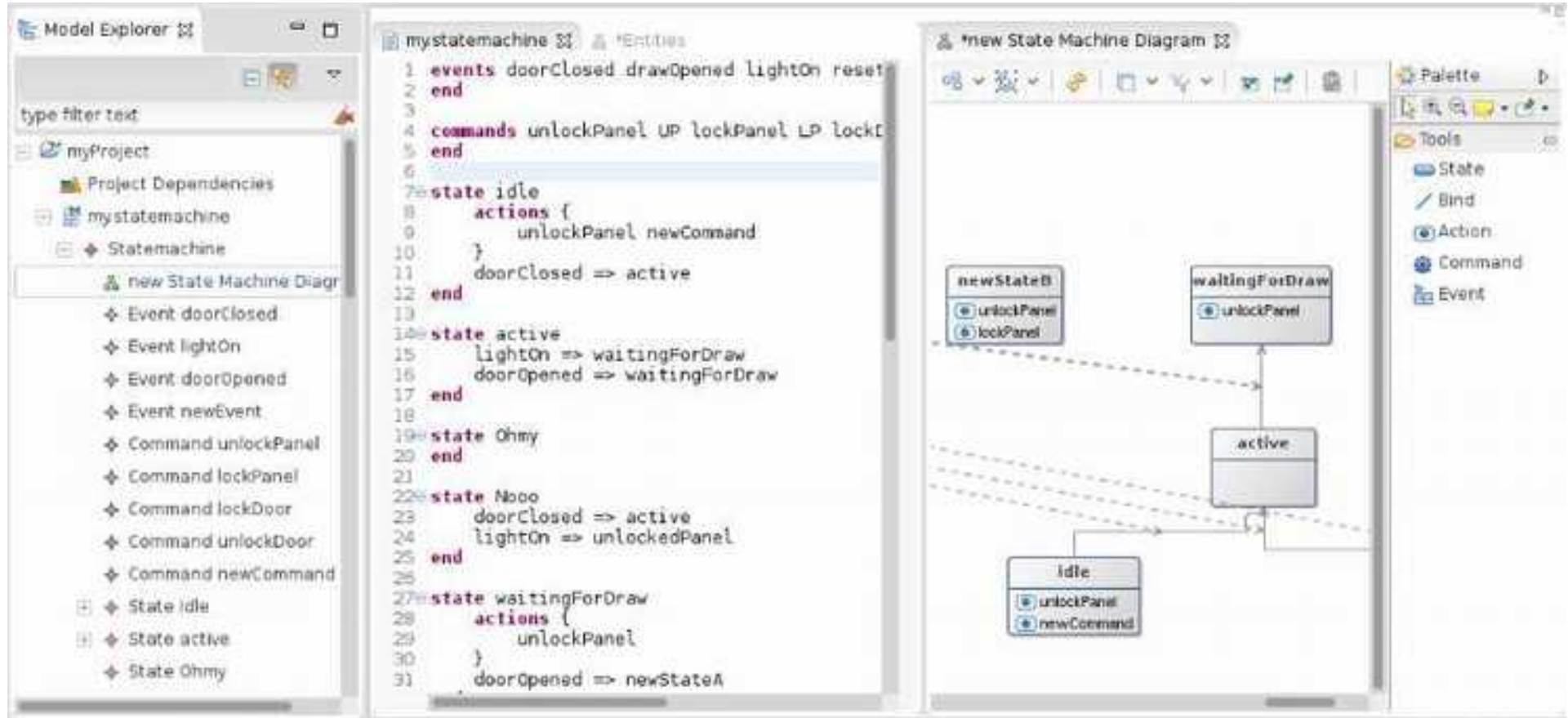
<input checked="" type="checkbox"/>	_____
<input type="checkbox"/>	_____
<input checked="" type="checkbox"/>	_____



DOWNLOAD

Two views of the same model

Xtext



File/Workspace level integration
DSL syntax used as the serialization format
DSL AST used in the Sirius Editor

With or Without EEF



Properties

Composite Processor Robot Central Unit

Property	Value
Capacity	10
Consumption	132
Incoming Flows	
Load	0
Name	Robot Central Unit
Outgoing Flows	
Power Status	none
Status	active
Temperature	24
Usage	unused
Weight	26



Problems Javadoc Declaration Console Properties Search

Base

Documentation

Properties

Name : name

HelpID :

Binding

Model : name

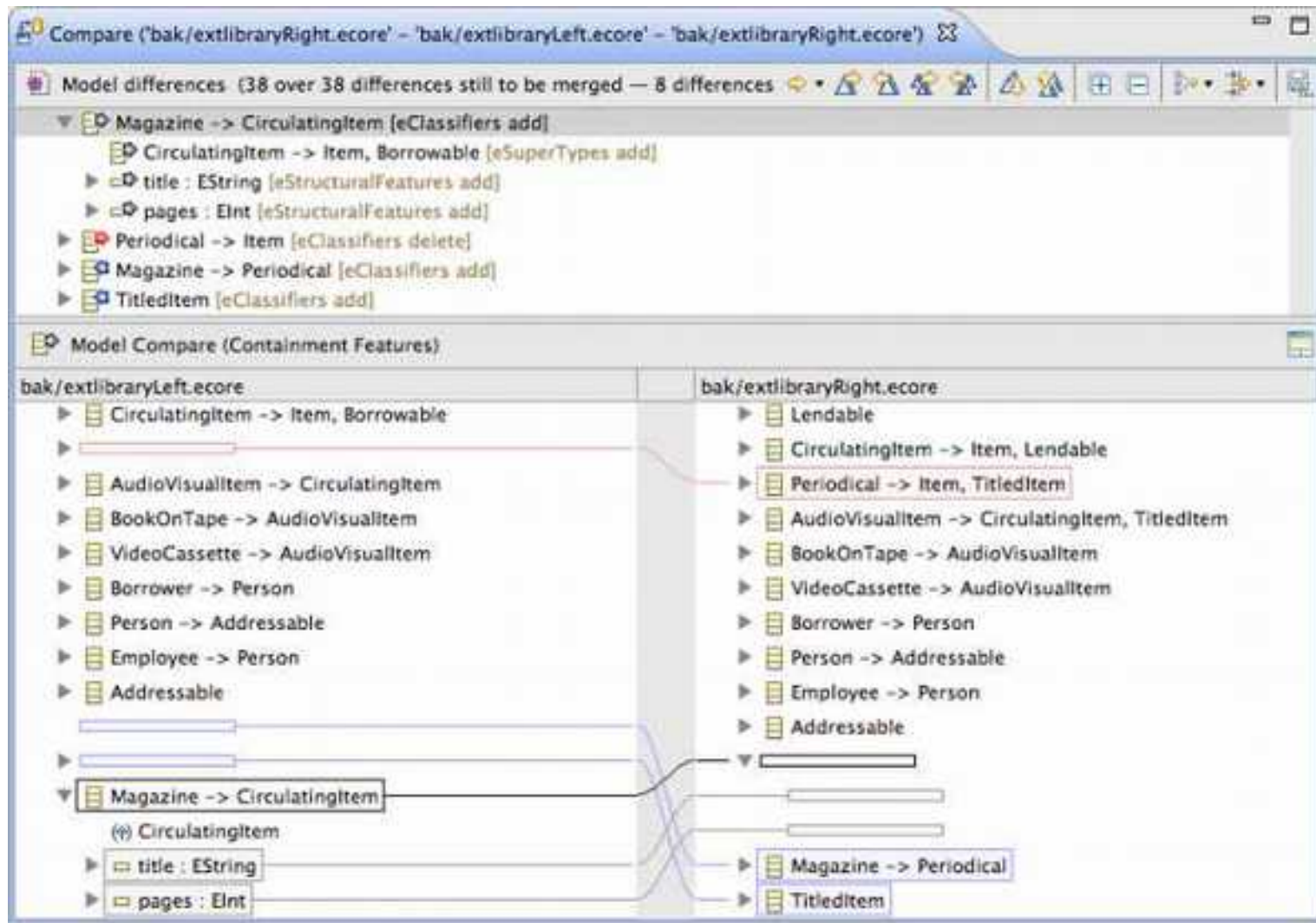
Views :

Views

Element Editor name

Ajouter Supprimer

EMF Compare





Acceleo

```
[template public generateEntity(entity : Entity)]
```

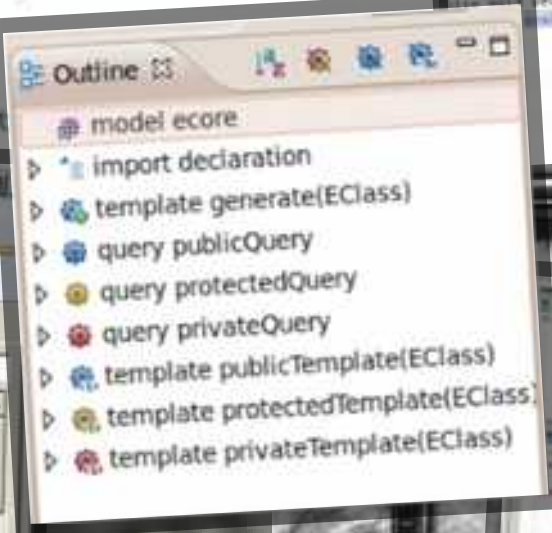
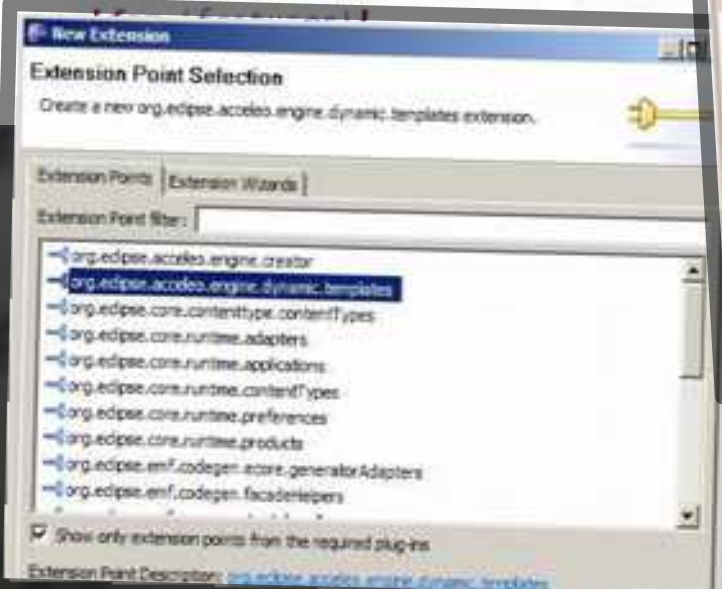
```
[comment @main /]  
[file (getFullPathFile(  
package [eCont
```



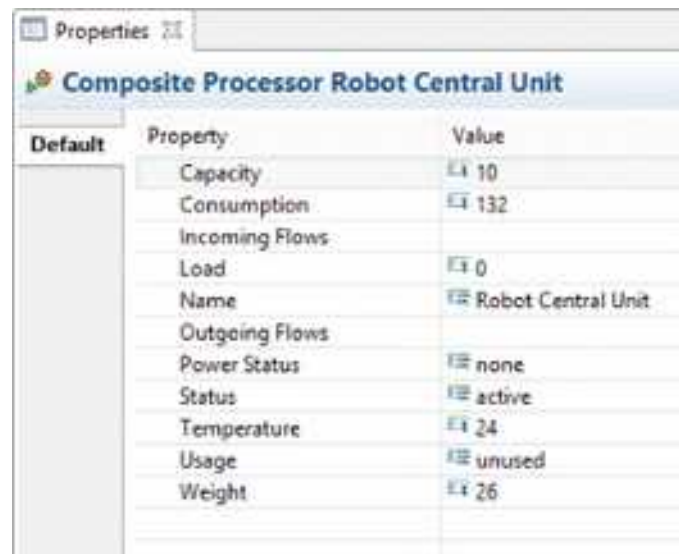
```
[protected (c.name)]  
  
import java.util.List;  
  
[/protected]
```

```
implements Serializable {
```

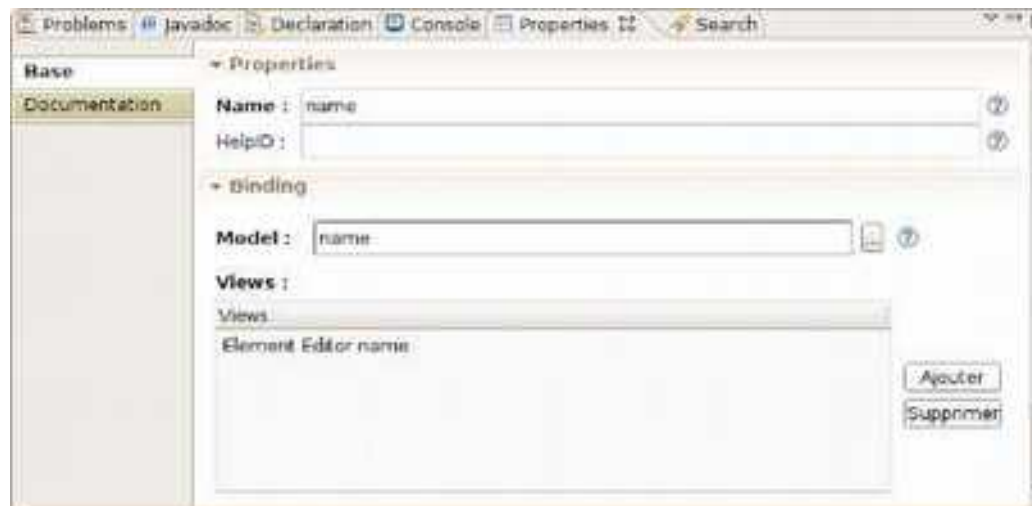
```
[comment Generate code for attribut
```



With or Without EEF



Default	Property	Value
	Capacity	10
	Consumption	132
	Incoming Flows	
	Load	0
	Name	Robot Central Unit
	Outgoing Flows	
	Power Status	none
	Status	active
	Temperature	24
	Usage	unused
	Weight	26



Problems Javadoc Declaration Console Properties Search

Base

Documentation

Properties

Name : name

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Model : name

Views :

Views

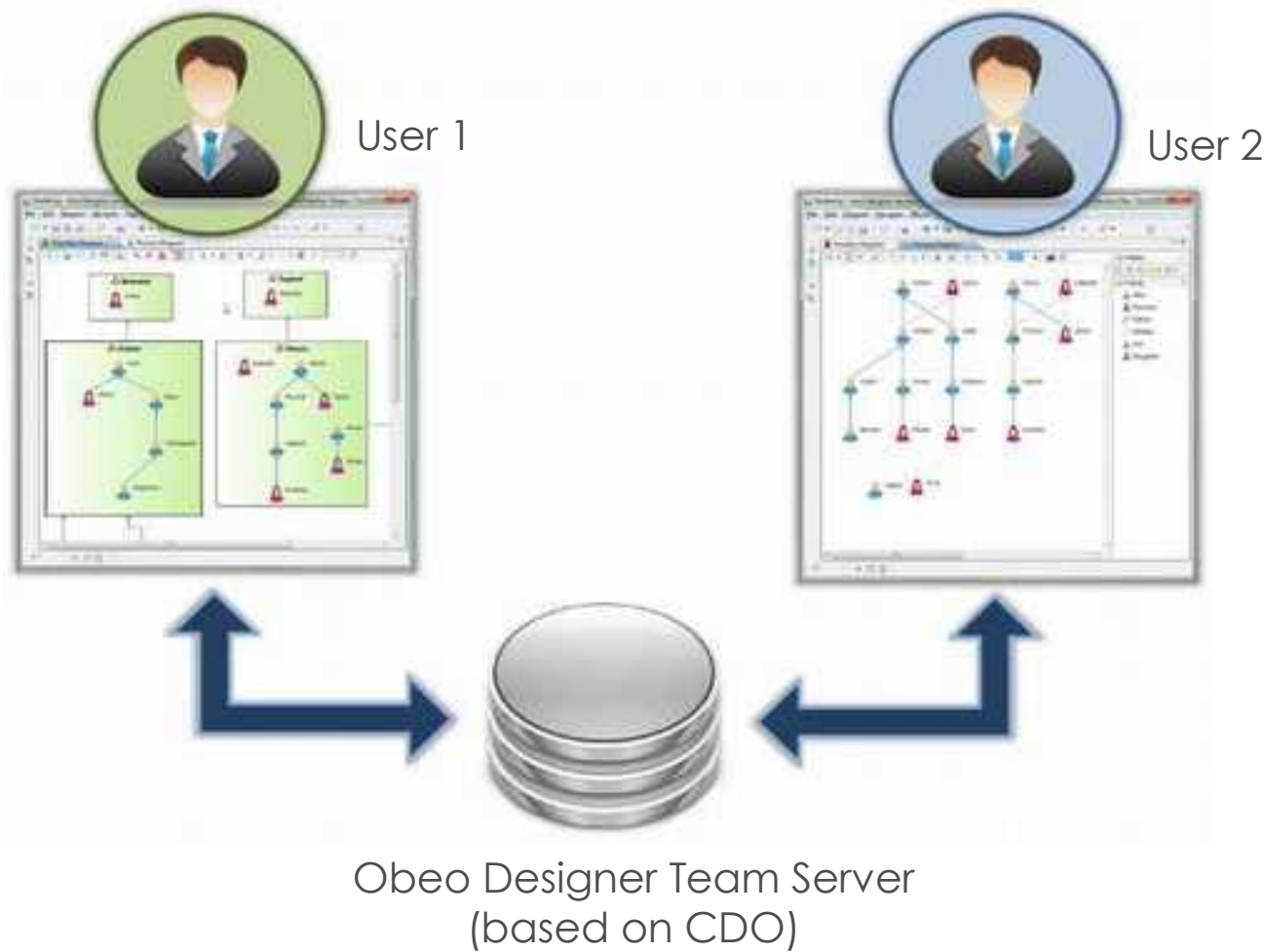
Element Editor name

Ajouter Supprimer



Live Collaboration

- Shared Repository and collaborative features



DSL vs Standards (UML) ?

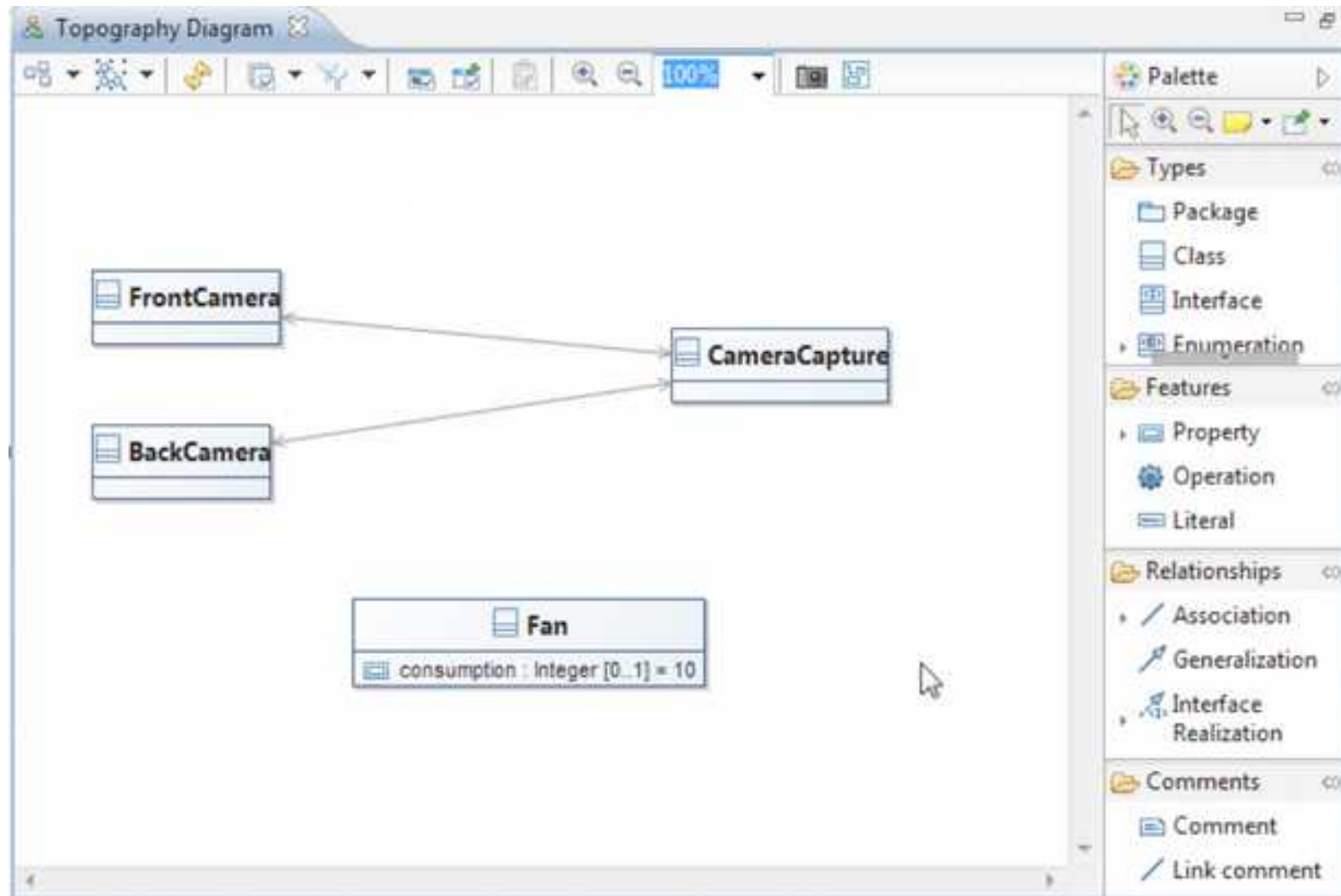
- **DSL = x industrialized standards**
 - Analysis to find the best of breed of each standard
 - Fork, Combine, Extend, Adapt to the business vocabulary
 - Create and reuse Designers
 - Bridge to engines (generators, simulators, validators, ...) and partners



UML : Utopian Markup Language ?



UML, yes, but be carefull about Profils



UML, yes, but be carefull about Profils



```
<upperValue xsi:type="uml:LiteralUnlimitedNatural" xsi:id="_LnPGIbB_EeG06LGzBbJLsw" value=""/>
<lowerValue xsi:type="uml:LiteralInteger" xsi:id="_LnPGIbB_EeG06LGzBbJLsw"/>
</ownedEnd>
</packagedElement>
<packagedElement xsi:type="uml:Class" xsi:id="_T2x1VLB_EeG06LGzBbJLsw" name="Fan">
  <ownedAttribute xsi:id="_U2jVVLB_EeG06LGzBbJLsw" name="consumption">
    <type xsi:type="uml:PrimitiveType" href="pathmap://UML_LIBRARIES/UMLPriIMITIVEtypes.library.uml@Integer"/>
    <upperValue xsi:type="uml:LiteralUnlimitedNatural" xsi:id="_U2o88L0_EeG06LGzBbJLsw" value="1"/>
    <lowerValue xsi:type="uml:LiteralInteger" xsi:id="_U2oN4L0_EeG06LGzBbJLsw"/>
    <defaultValue xsi:type="uml:LiteralString" xsi:id="_#B2B0L0_EeG06LGzBbJLsw" value="10"/>
  </ownedAttribute>
</packagedElement>
</packagedElement>
</packagedElement>
```

```
</elements>
<elements xsi:type="flow:DataSource" volume="6" name="Front Camera">
  <outgoingFlows usage="low" capacity="20" load="6" target="//@elements.1/@elements.0"/>
</elements>
<elements xsi:type="flow:DataSource" usage="standard" volume="5" name="Back Camera">
  <outgoingFlows usage="low" load="5" target="//@elements.1/@elements.0"/>
</elements>
<elements xsi:type="flow:Fan" consumption="20" speed="2000" weight="10"/>
</elements>
<elements xsi:type="flow:DataSource" usage="standard" volume="3" name="Wifi">
  <outgoingFlows usage="standard" capacity="3" load="5" target="//@elements.0/@elements.0"/>
</elements>
</flow:System>
```


Principle

Describe the
Graphical Designer

Leverage the
Models

Define the
Domain Model

1

Business Vocabulary

- Concepts
- Relations
- Properties

2

Representations

- Displayed elements
- Shapes
- Colors
- Fonts

Edition tools

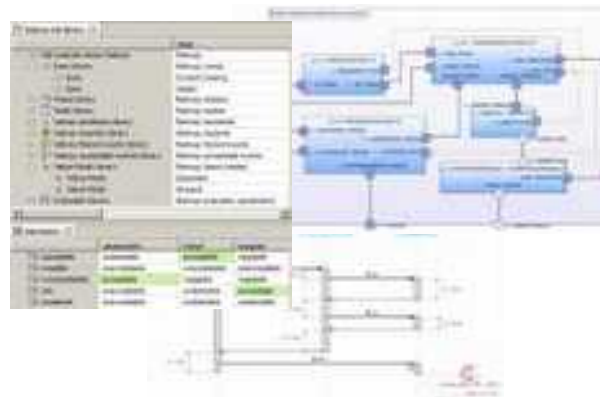
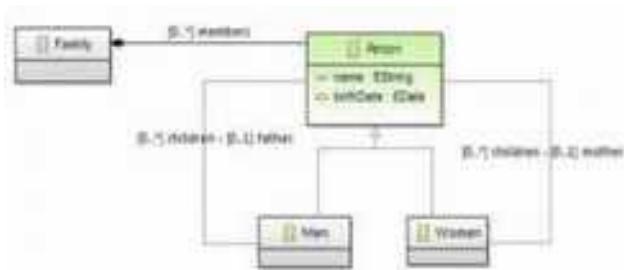
- Palettes
- Drag & Drop

3

Model-Driven Tools

- Generation
- Validation
- Comparison
- Transformation

```
[for (person:Person | family.members)]  
  [person.name | name/] [person  
  [person.name.toLowerCase()]/]  
  family.getMembers().add(person)  
[/for]
```



Is MDSD growing or slow down?

THALES

esa

la Retraite
solidaire

M M A

Atos BULL

ERICSSON

cnes

MINISTÈRE
DE LA DÉFENSE

LIBERTÉ ÉGALITÉ FRATERNITÉ
REPUBLIQUE FRANÇAISE
MINISTÈRE
DES AFFAIRES ÉTRANGÈRES

Capgemini
CONSULTING. TECHNOLOGY. OUTSOURCING

AIRBUS
GROUP

ALSTOM

SAFRAN
AEROSPACE - DEFENCE - SECURITY

erdf
ÉLECTRICITÉ RÉSEAU DISTRIBUTION FRANCE

chorégie

pôle emploi

steria

orange
Business
Services

AREVA

ifp
Energies
nouvelles

MAIF

Projets Jeunes

syleps

ALL4TEC

edf
ROLLS
ROYCE

PEP
CENTRE TECHNIQUE
DE LA PLASTURGIE

MINISTÈRE DE L'ÉCONOMIE
ET DES FINANCES

geensyde
system design for efficiency

Esterline
CMC Electronics

KARI
한국항공우주연구원
Korea Aerospace Research Institute

Loterie
Nationale
Loterij

Auchan

beo
Model Driven Company

Next challenges

- Documentation ↔ Model synchronisation
- DSL for non IT
- MDSD for dev
- Viewpoints
- Graphical / Textual Expressivness



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