

IDEaliSM project presentation

CAxMan event, Barcelona, May 2 2016

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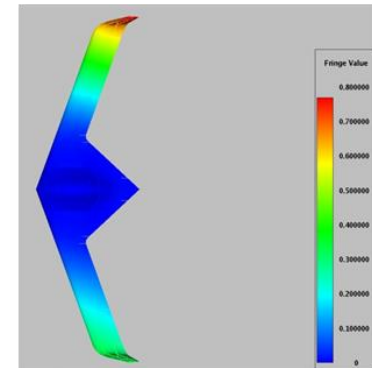
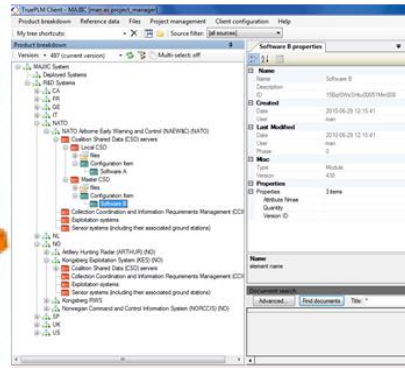
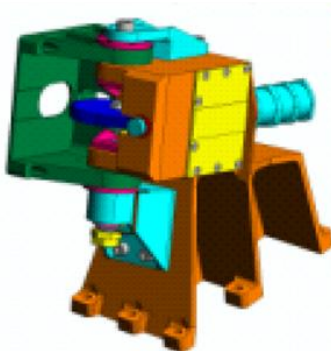
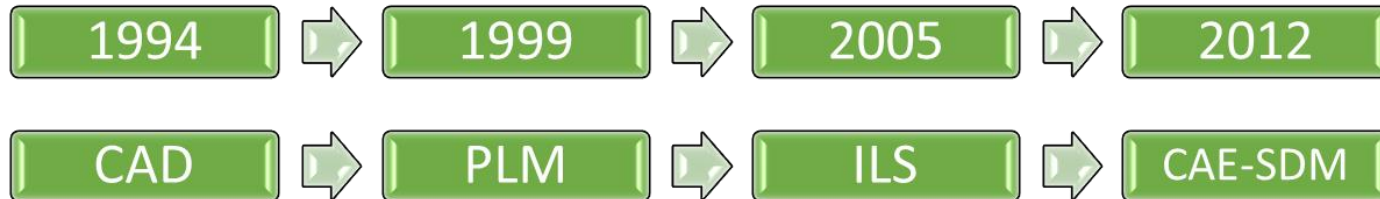
Built Environment



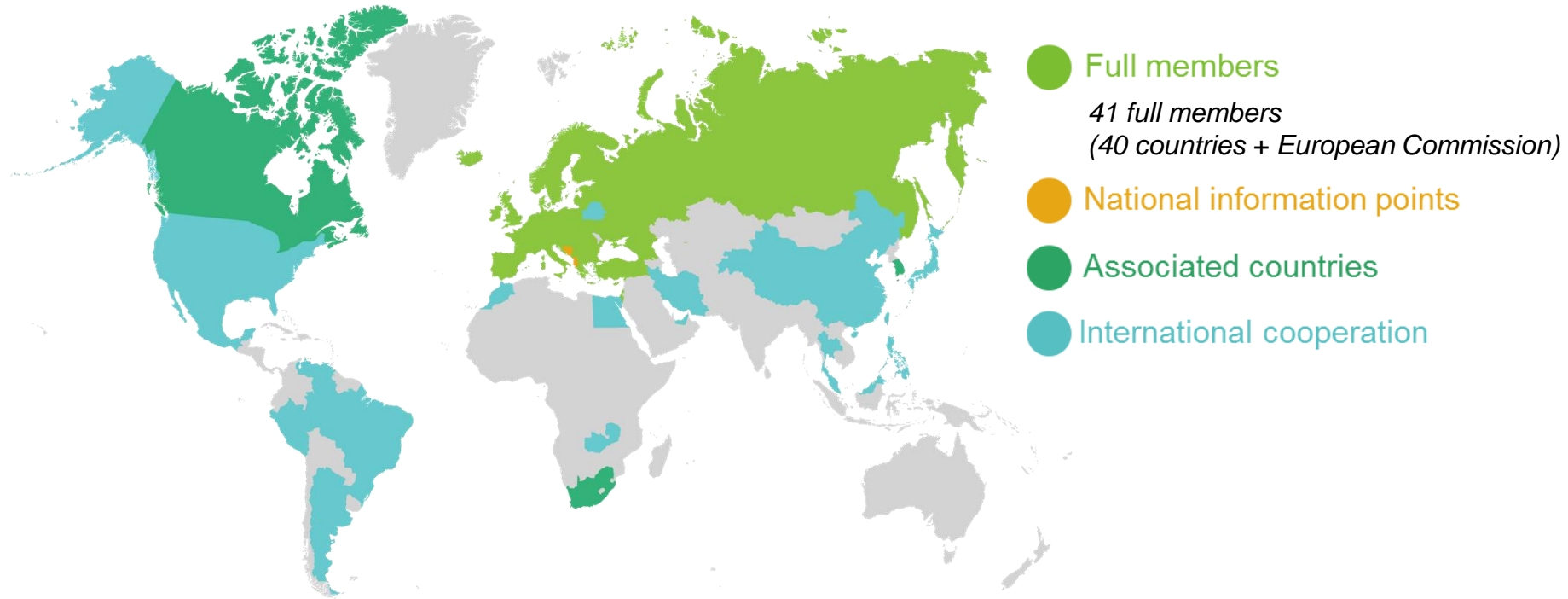
Defence



Aeronautics



The EUREKA framework



- The scope of ITEA is Software-intensive Systems and Services
- EUREKA is a pan-European network for market-oriented, industrial R&D
- Following the EUREKA structure, each ITEA project partner can apply for national funding in their own country

ITEA call 8 – IDEaliSM project



- 14 Partners, 5 Countries, 3 yr program
- Use cases from Aerospace and Automotive
- Integrated & Distributed Engineering Services Framework

IDEALISM
Integrated & Distributed Engineering Services Framework for MDO



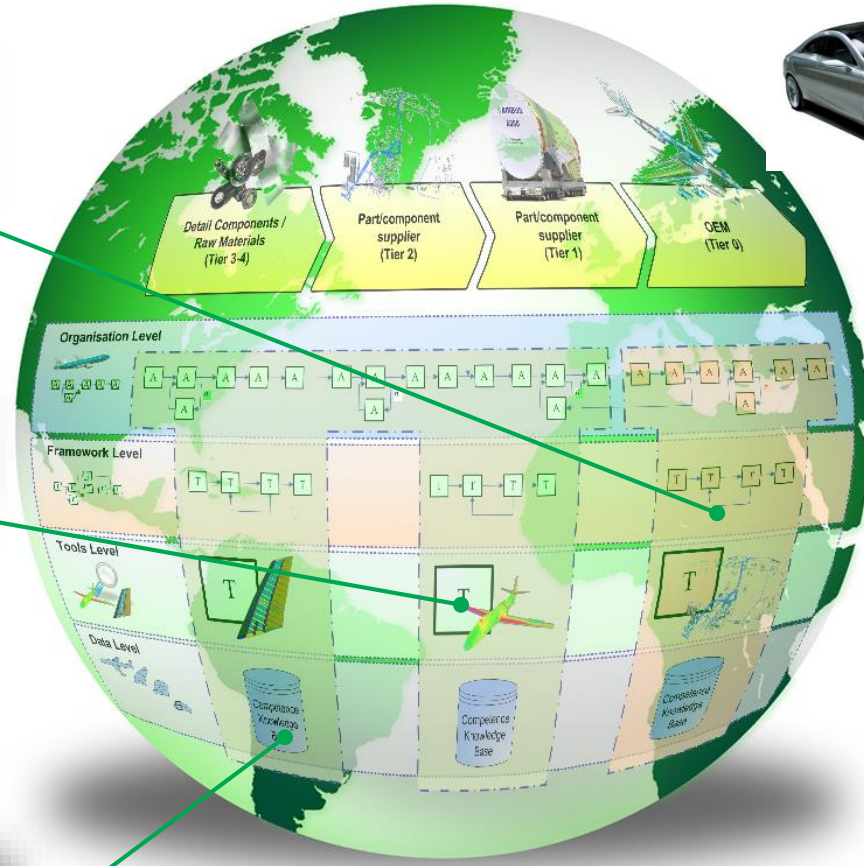
Content

- Introduction
 - Background
 - Project Objectives
 - Main innovations
 - Key deliverables
- Use case demonstrator: “aircraft rudder in one month”
- Summary and next steps

Background: mobility and the Digital society

Digital society: collaboration increasingly virtual

Mobility: need for affordable transport



Integration with a multitude of customers

Specialization based on knowledge and expertise

IDEaliSM vision

- **Drastically improving the time-to-market and development cost** of high-tech structures and systems
- By enabling **continuous integration** of distributed and specialized development teams
- Via a flexible and **service-oriented framework** for *multidisciplinary design optimization* that is capable of integrating people, process and technology

IDEALISM

Integrated & Distributed Engineering Services Framework for MDO

IDEaliSM features 3 main deliverables

An **advanced integration framework**

for distributed multidisciplinary design and optimization, enabling companies to offer and share engineering services

An **engineering language workbench**

to enable flexible configuration of engineering workflows and services and straightforward integration into the advanced integration framework

A **methodology for service-oriented development processes**

to redefine the product development process and information architecture enabling collaboration between service-oriented Competence Centres in Distributed Development Teams

Objectives, innovations and consortium

Use case 1B

Aircraft design challenge

A: Accelerated aircraft MDO concept design study



AIRBUS
DEFENCE & SPACE



1A

B: Accelerated development of an aircraft rudder



FOKKER
AEROSTRUCTURES **IDEC**



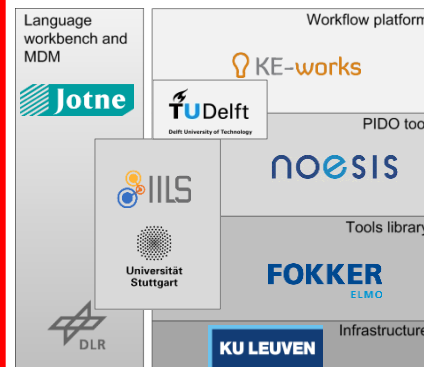
1B

10-day harness

Aerospace: wire harness layout in 10 days



FOKKER
ELMO



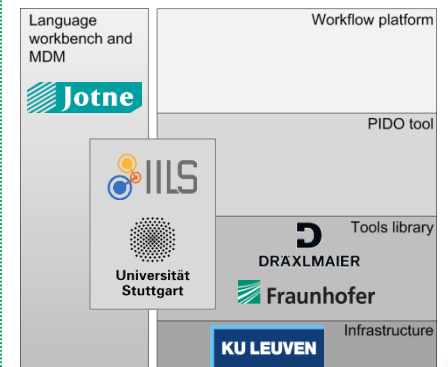
2

Cockpit in 3 weeks

Automotive: cockpit wire harness design in 3 weeks



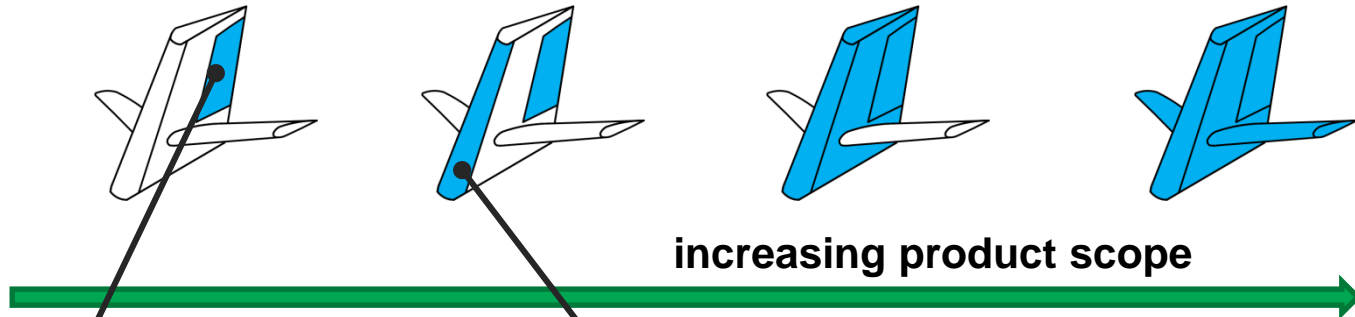
DRÄXLMAIER



3

Use case - Rudder in one Month

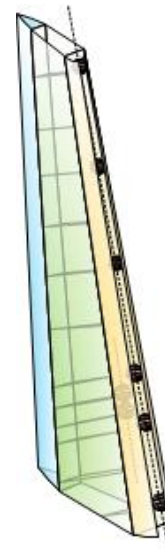
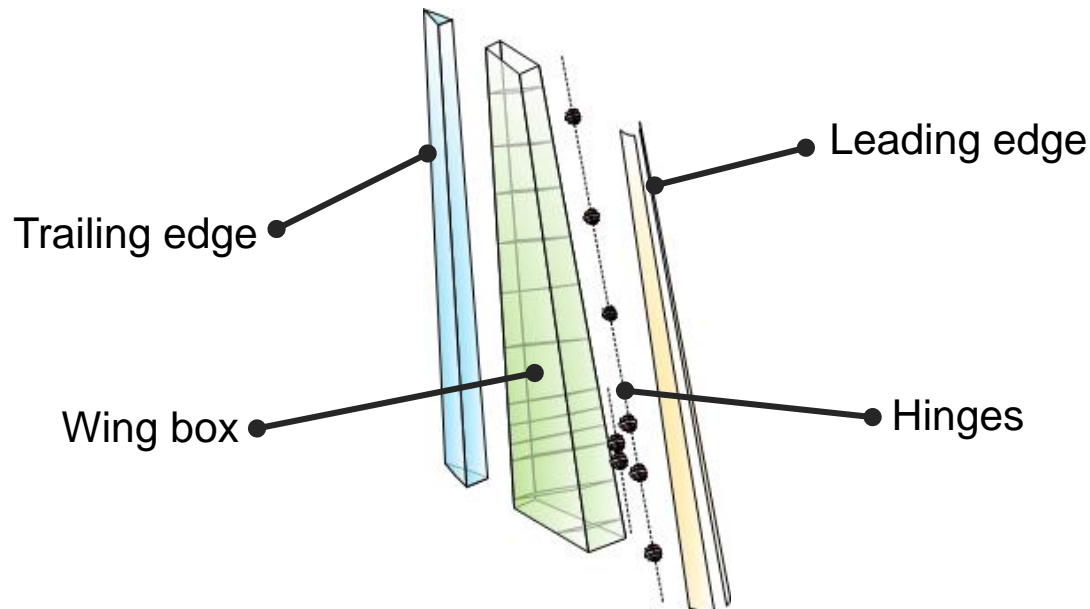
Product:



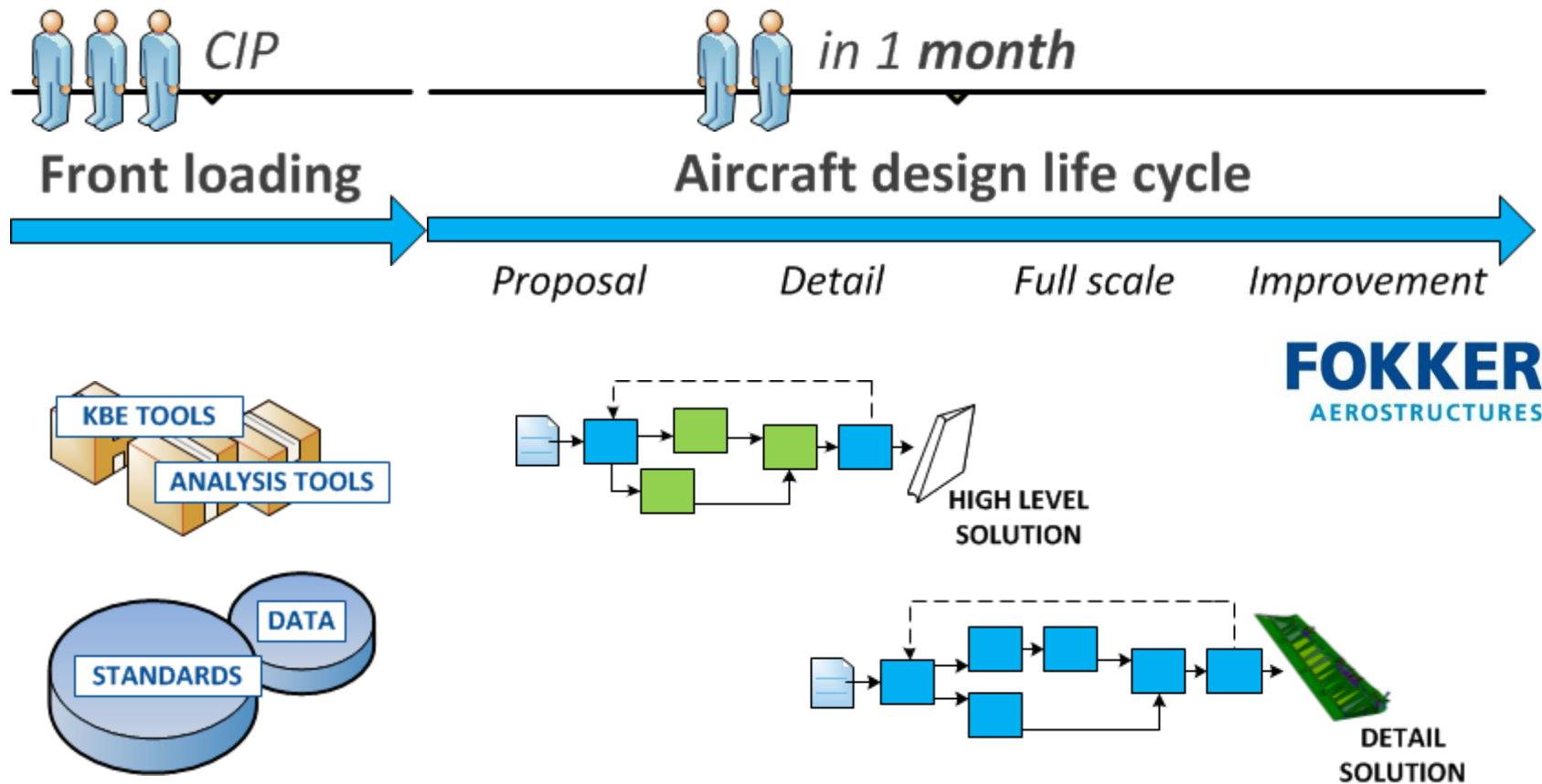
Scope use case
Fokker Aerostructures: **rudder**

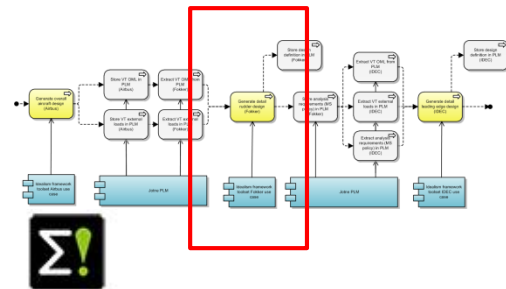
Scope use case
IDEC: **VT leading edge**

FOKKER
AEROSTRUCTURES

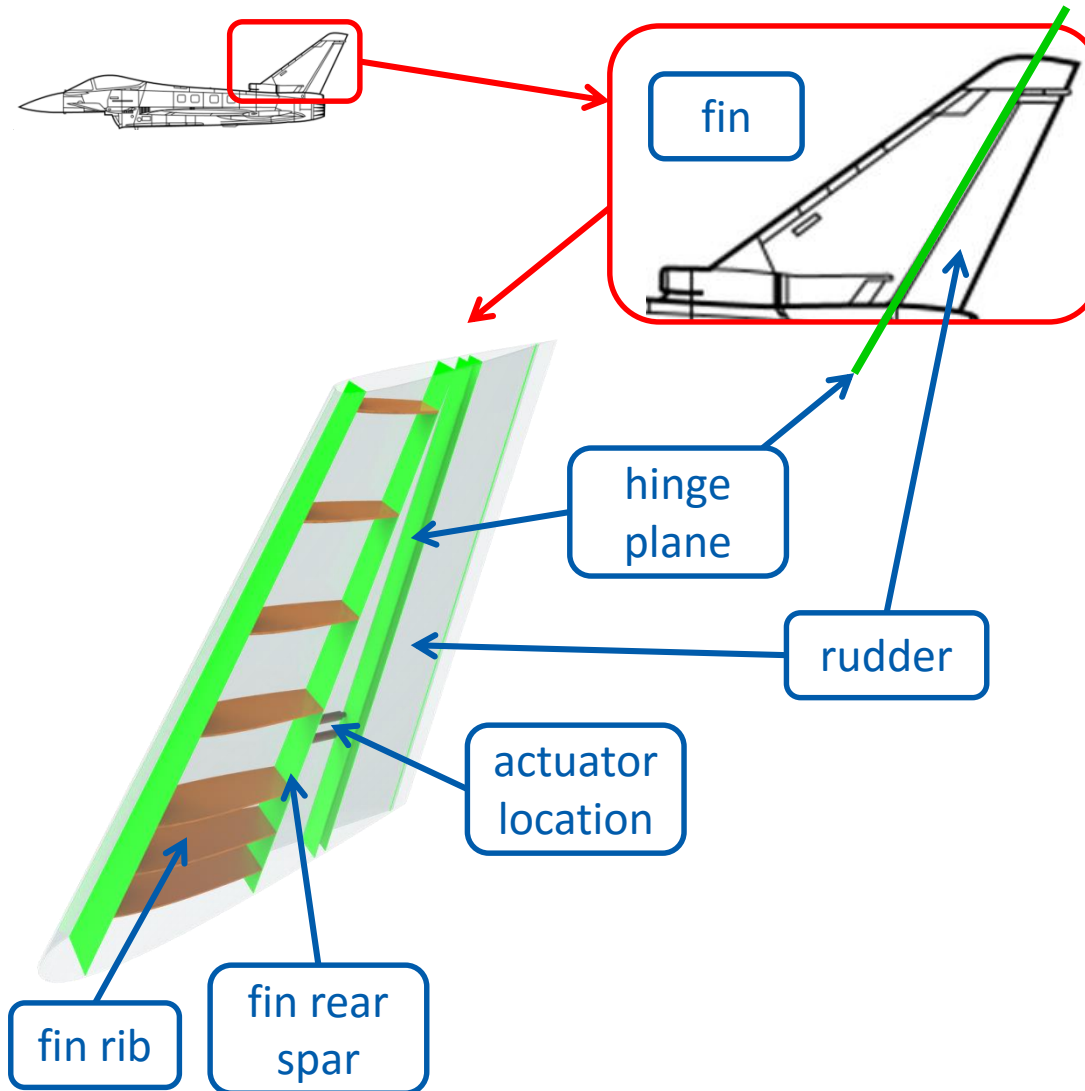


Ambition

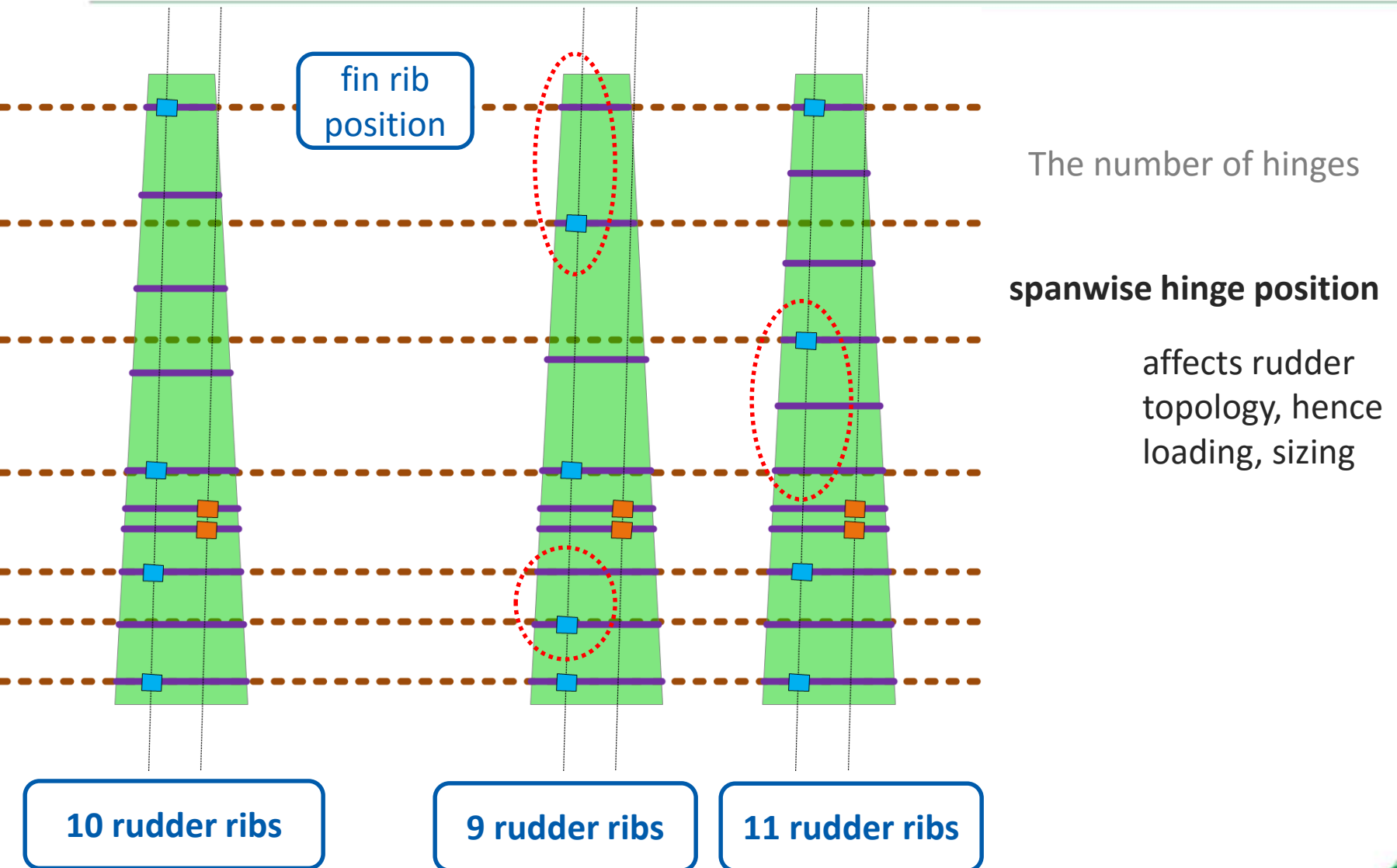




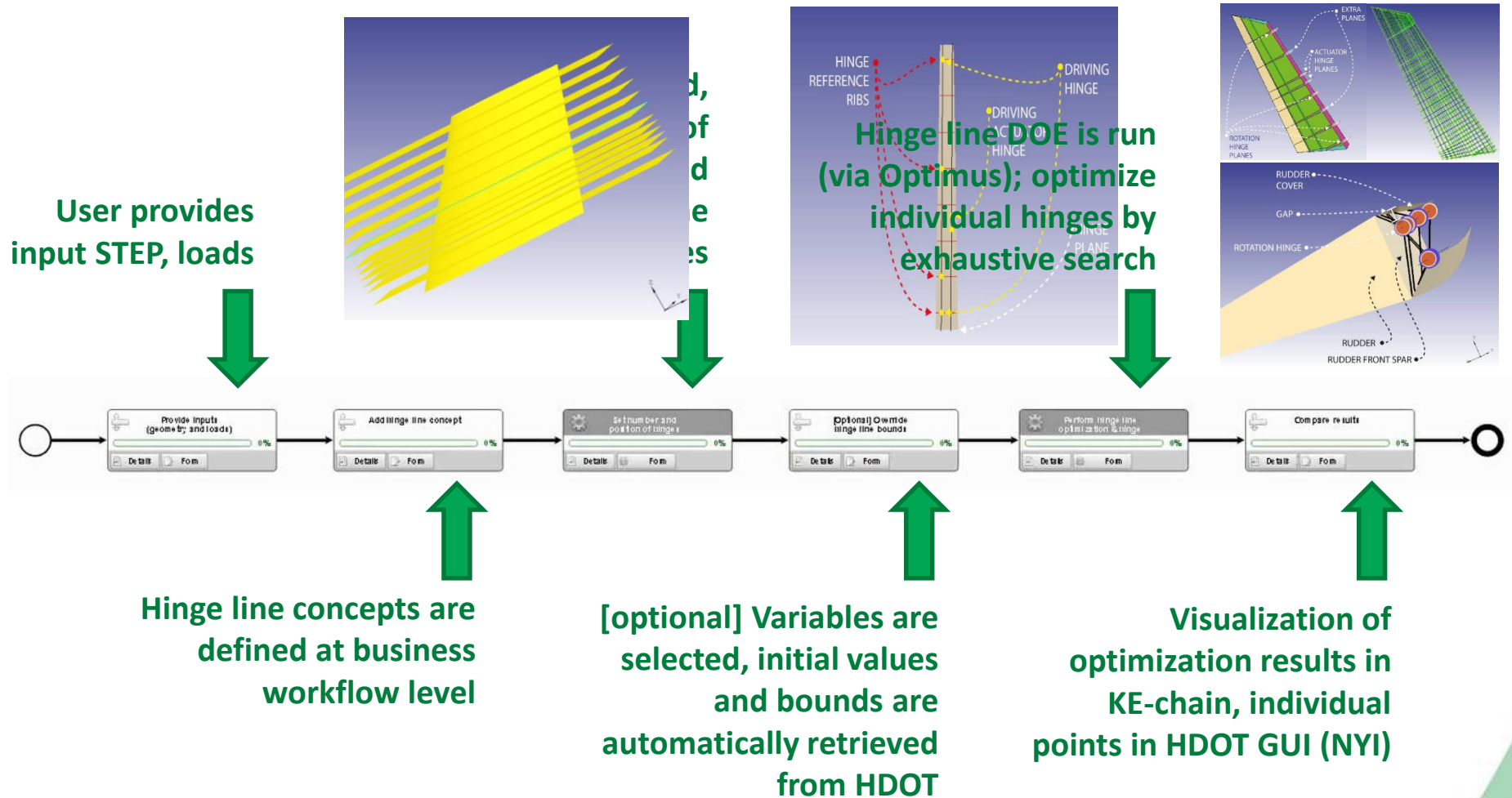
Today's demonstrator



What can we vary?



Today's demonstrator

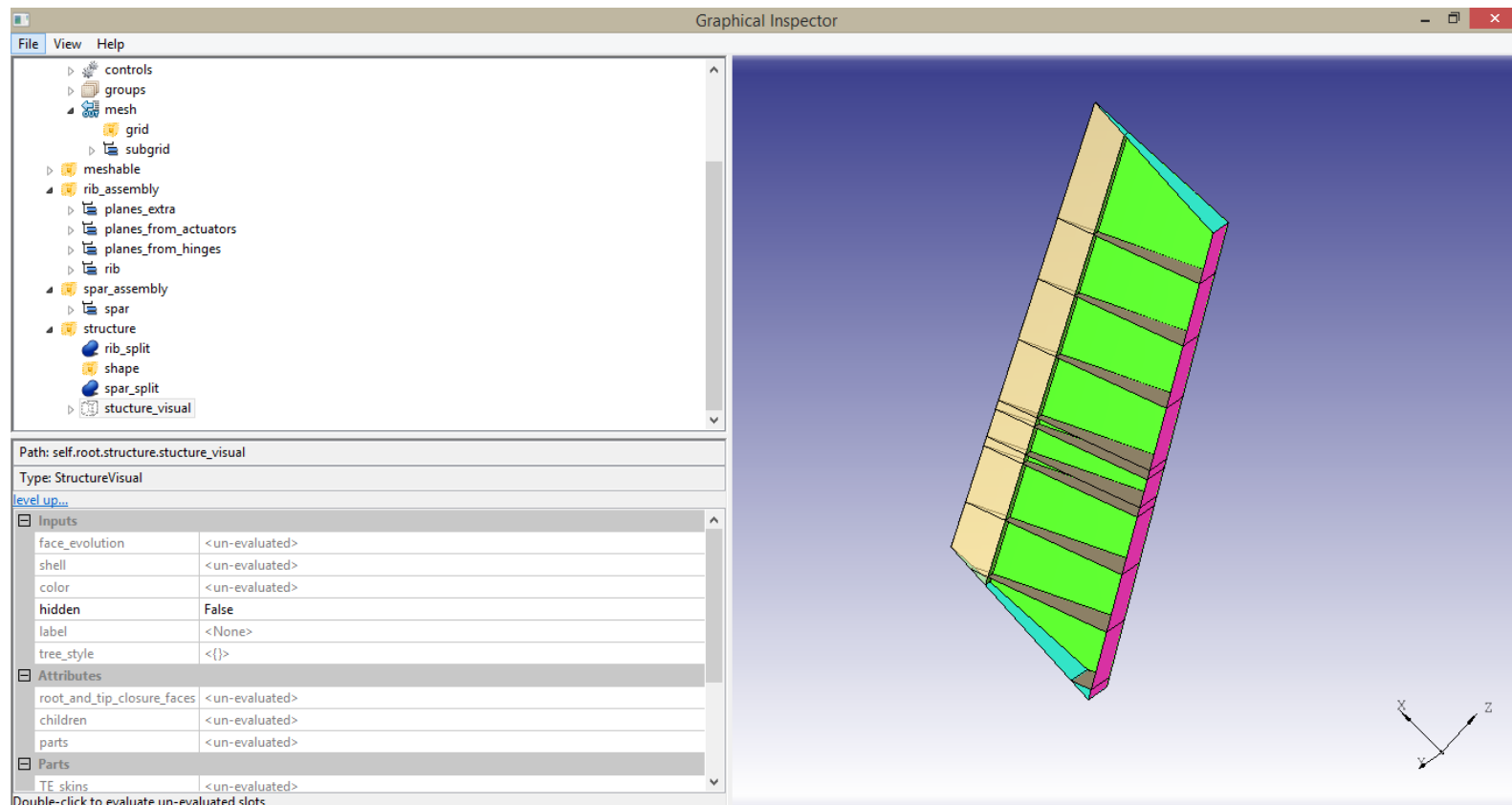
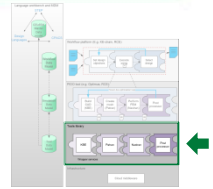


Use case 1B: Demonstration / video

Framework Component 3/5

Tool Library

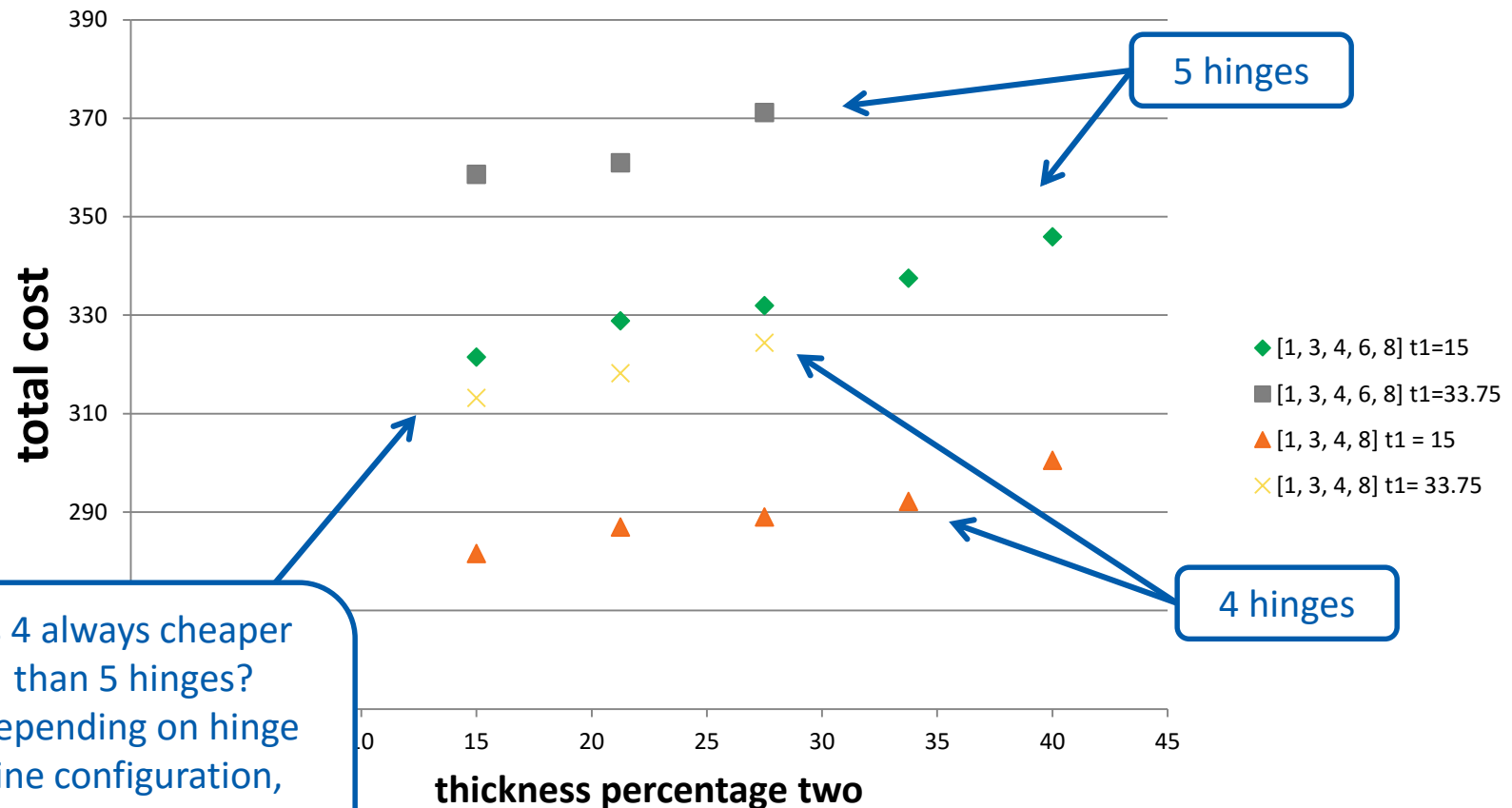
- Providing analysis capabilities



paraPy (TU Delft)

Some DOE results

**Thickness percentage two vs total cost
for 2 hinge configurations and a constant t1**

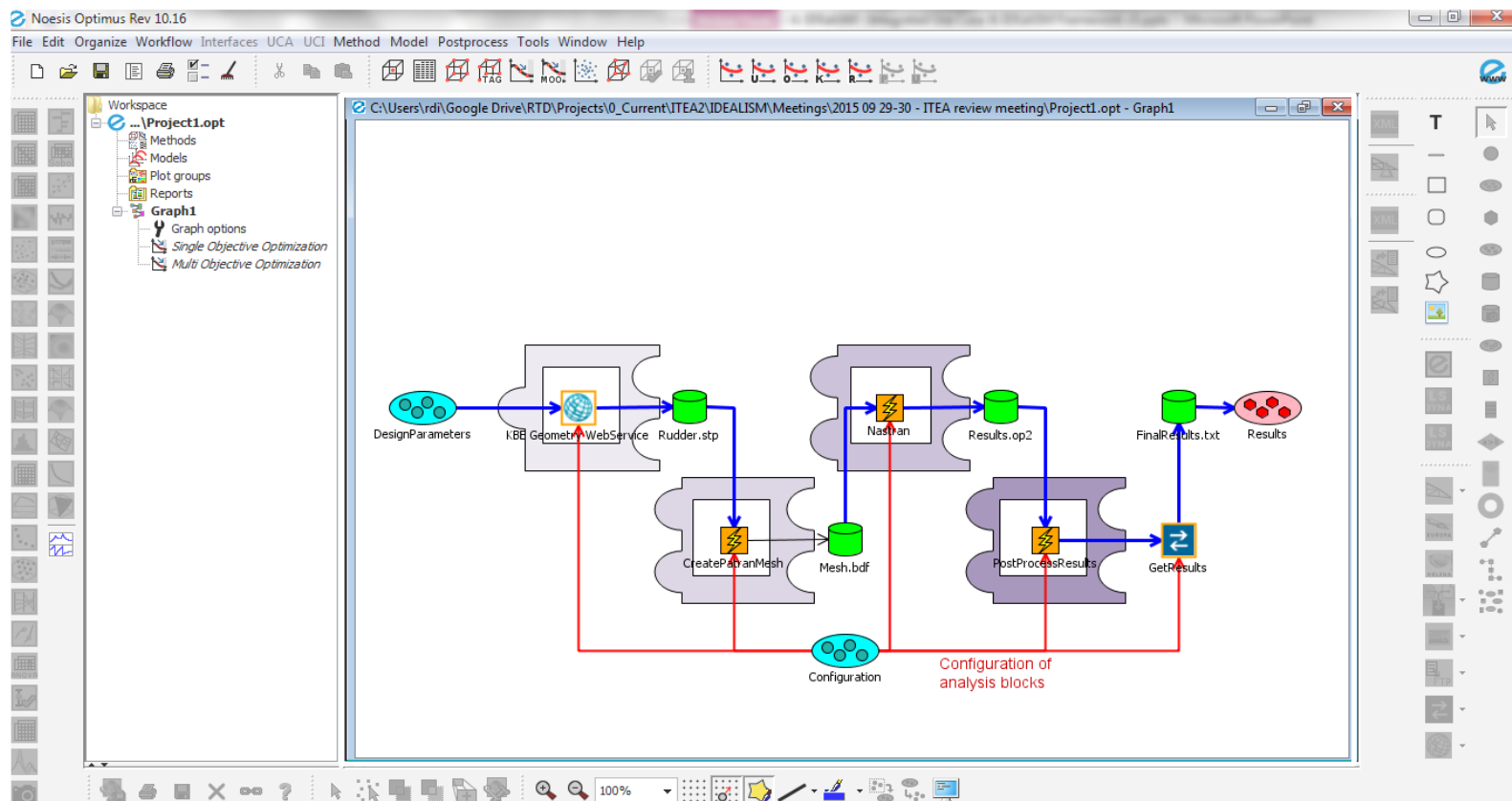
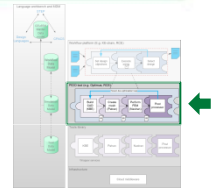


Is 4 always cheaper than 5 hinges?
Depending on hinge line configuration, cost of a 4 and 5 hinge system can be close

Framework Component 2/5

PIDO Tool

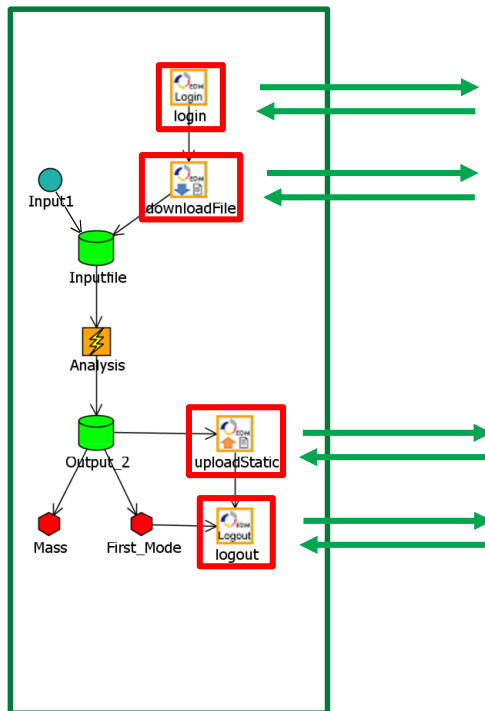
- Materializing workflows
- Performing multidisciplinary design optimization (MDO)



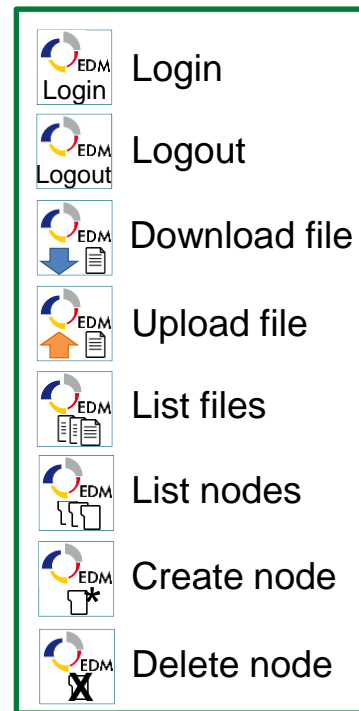
Optimus (Noesis)

Integration PIDO – PLM

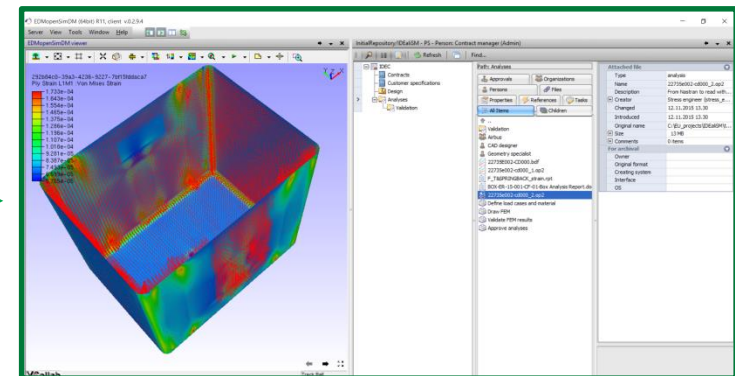
Noesis Optimus workflow



Optimus – EDM server interface



ISO 10303 (STEP) Open SimDM



Video

**Automatic interaction between simulation workflows and
ISO 10303 (STEP) – Open SimDM**

Video showing how the various tools has been integrated to the ISO 10303 (STEP) repository using the Jotne OpenSimDM application

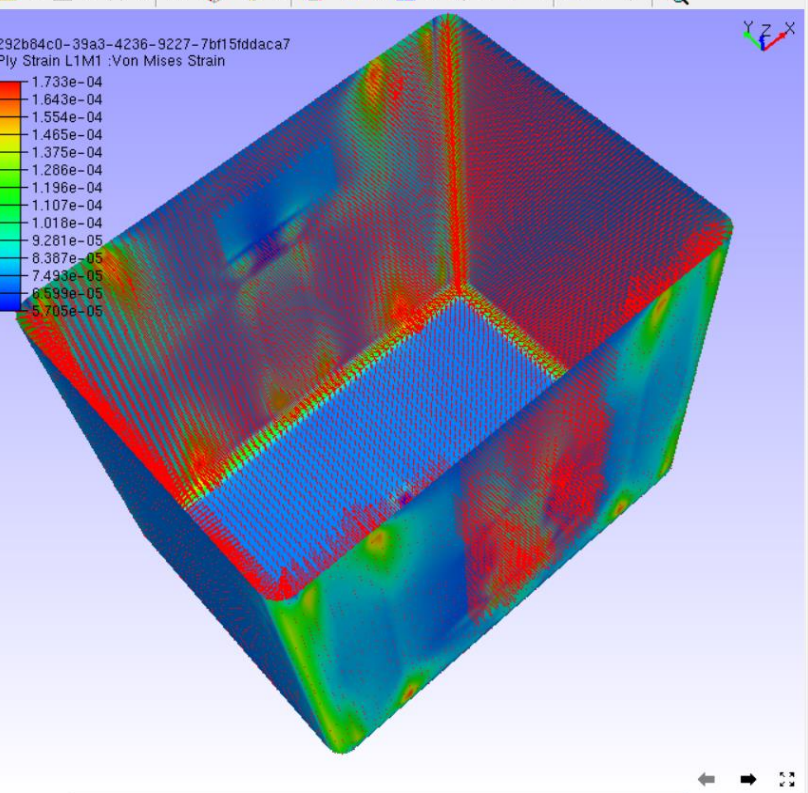
All data in ISO 10303-209 - Open SimDM

EDMOpenSimDM (64bit) R11, client v.0.2.9.4

Server View Tools Window Help

EDMOpenSimDM viewer

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Ply Strain L1M1 : Von Mises Strain



1.733e-04
1.643e-04
1.554e-04
1.465e-04
1.375e-04
1.286e-04
1.196e-04
1.107e-04
1.018e-04
9.281e-05
8.387e-05
7.493e-05
6.599e-05
5.705e-05

InitialRepository/IDEalISM - PS - Person: Contract manager (Admin)

Refresh Find...

Path: Analyses

Approvals Organizations
Persons Files
Properties References Tasks
All Items Children

Validation
Airbus
CAD designer
Geometry specialist
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22735E002-cd000_1.op2
F_T&SPRINGBACK_strain.rpt
BOX-ER-15-001-CF-01-Box Analysis Report.do
22735E002-cd000_2.op2
Define load cases and material
Draw FEM
Validate FEM results
Approve analyses

Attached file

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Introduced	12.11.2015 13.30
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Comments	0 items
For archival	
Owner	
Original format	
Creating system	
Interface	
OS	

VCollab

Track Ball

18.11.2015 10.25.06

10.25
18.11.2015

Achievements (from demonstrator)

Achievement

Modular framework with hybrid workflows, containing both simulation workflows, engineering services and manual tasks

First setup of language workbench to accelerate development of domain-specific applications (rudder hinge design)

Data storage, archiving and exchange between different framework setups using ISO 10303-209 (STEP repository using Jotne OpenSimDM)

Thank you for your attention

<https://itea3.org/project/idealism.html>