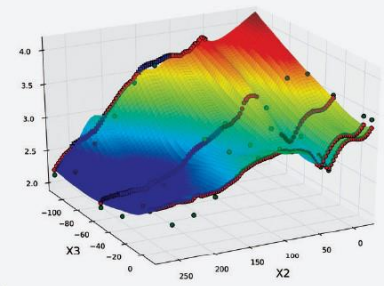
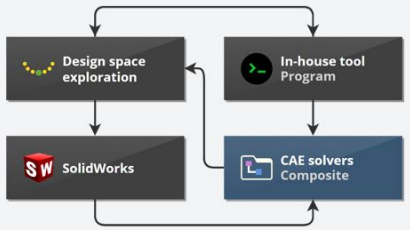
pSeven





Aras Innovator & pSeven Enterprise

Demo scenario

Gaspard Berthelin

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Aras Innovator + pSeven Enterprise demo

Main goal of the demo is to demonstrate an integration example with ARAS Innovator and pSeven Enterprise for some typical industry process: design process of the turbine disk.

ARAS Innovator is used in the demo as an **SPDM** platform and provide the following:

- workflow engine for business processes;
- functionality for data models creation;
- simulation data storage capabilities;
- simulation data versioning control.

pSeven Enterprise is used in the demo as a **web-based platform for simulation processes automation** with following functionality:

- workflow engine for simulation processes automation;
- possibility to combine local and remote execution of simulation workflow blocks (data pre- and postprocessing, solvers execution and etc.) within one workflow;
- access via REST API.

pSeven Enterprise as a Low-code Simulation Workflow Engine for SPDM solutions

CAD/CAE &
In-house/legacy
tools

...

SOLIDWORKS

SIEMENS NX

Ansys

OPENMANIFOLD

STAR-CCM+

SIMSCALE

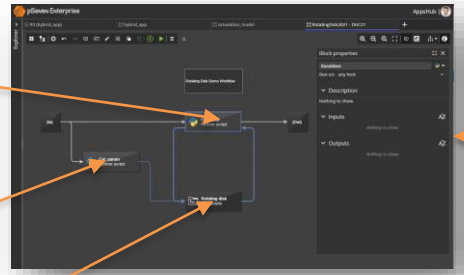
rescale

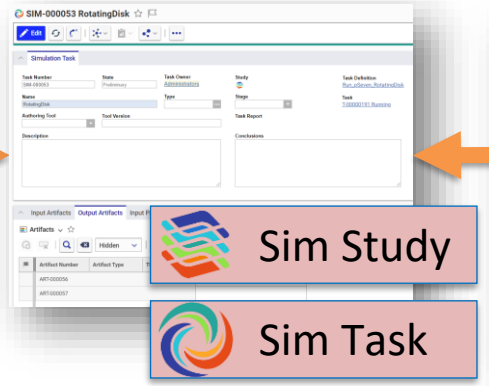
python

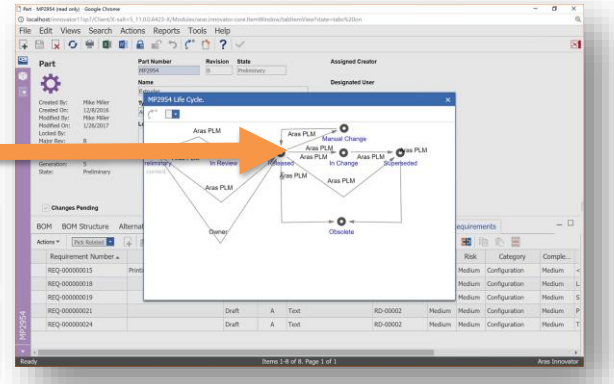
...

pSeven Enterprise

aras







Sim Study

Sim Task

Task Def

Exec Type

Artifact

Simulation Workflow

Low-code to wrap & automate quickly

Task/Approval Workflow

Process lifecycle & Artifact management

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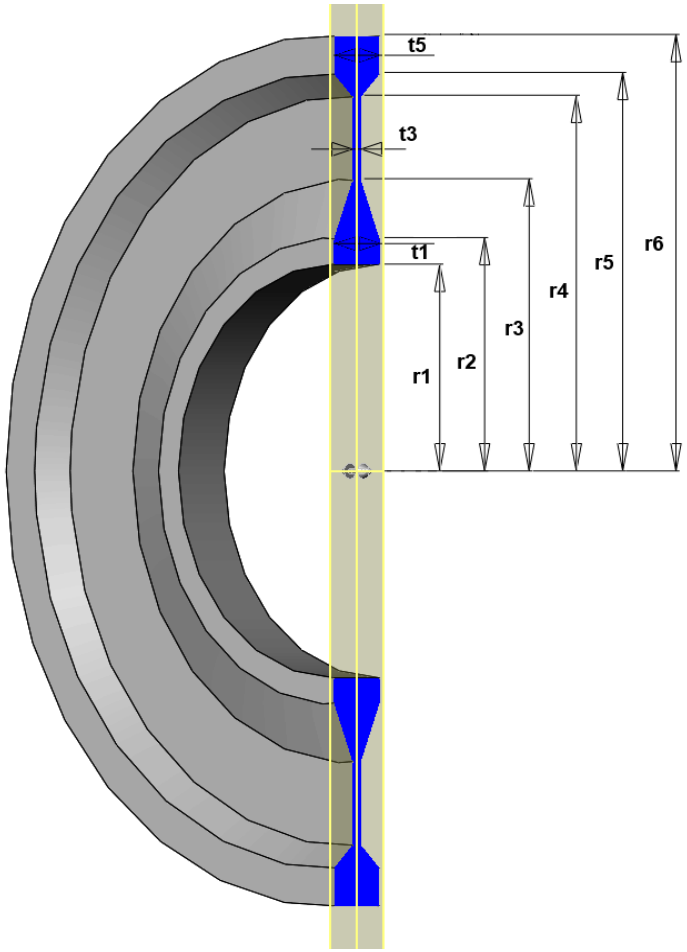
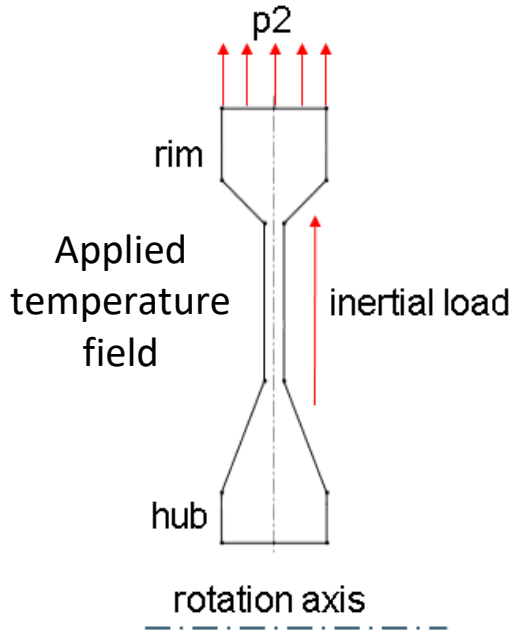
Demo scenario: study object

- Study object of the demo: turbine disk
- High-speed rotating disk geometry is described by 6 radii *(**r1 – r6**)* and 3 thickness (**t1, t3, t5**) parameters
- The disk is subjected to inertial load, temperature field and additional loads from blades mounted on the disk:
  - p2 = -Mb*ω^2/(2π*t5), N/m^2
  - ω = 2πN /60, rad/s
- Temperature field for a structural analysis should be taken from a thermal analysis.

Rotating disk geometric model (parameterized CAD model)



Loads in structural model



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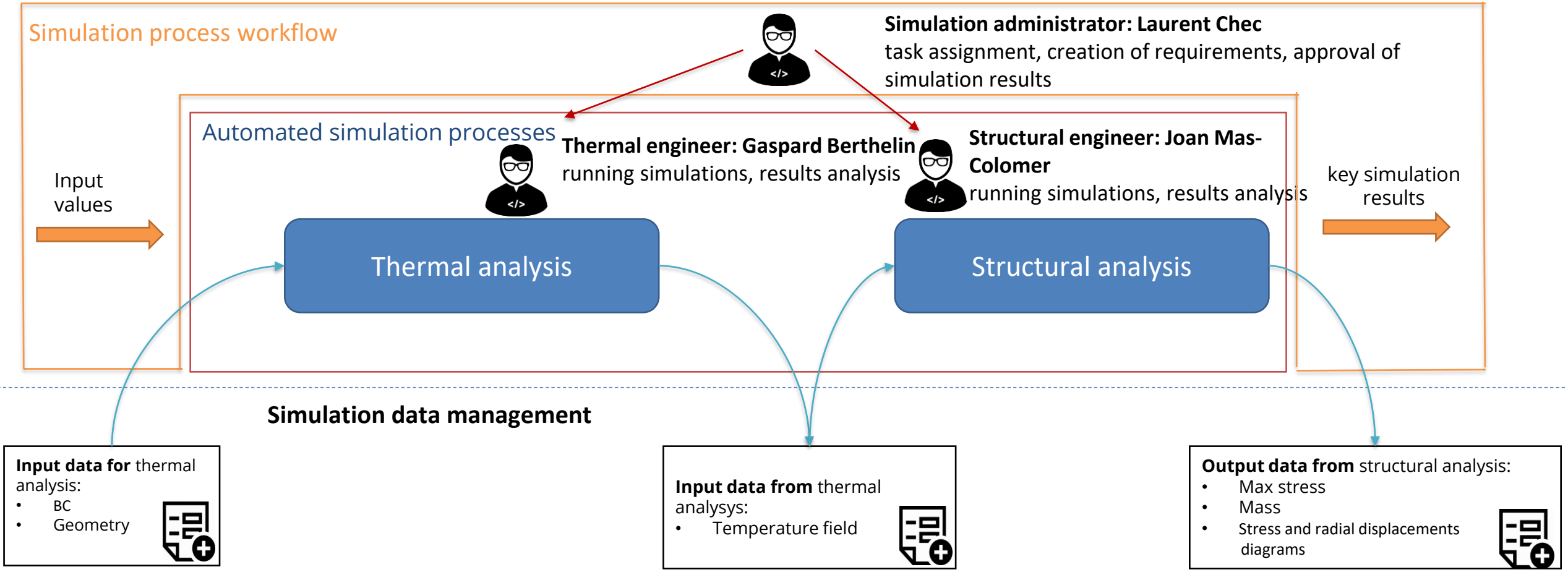
Demo scenario: turbine disk design process



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Logic of Aras Innovator and pSeven Enterprise integration

ARAS Innovator:

1. Checks that the input data meets the template contents and create an instance of input data model

2. Launches simulation process workflow in pSeven Enterprise via REST API with full input data model

3. Checks the output from pSeven Enterprise, creates an instance of output data model and stores it

Input data

Input data template (input data model)

Contents (example):

1) Set of geometric parameters values (dictionary)
2) Temperature (file)

Launch of the automated simulation process

REST API

REST API

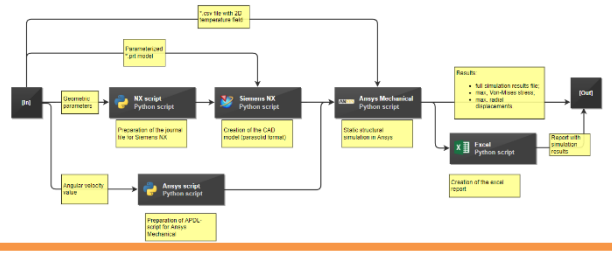
Output data template (output data model)

Contents (example):

1) Maximum Von-Mises stress (scalar value)
2) Mass (scalar value)
3) Diagrams (file)

Output data

Simulation workflow



ARAS Innovator

pSeven Enterprise

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