



PLATFORM SIMULATION IN ELECTRICAL ENGINE  
DEVELOPMENT - SEAMLESS DATA FLOW FROM  
REQUIREMENTS TO ASSEMBLY PLANNING



**Nicolas  
BROSSARDT**

Project Manager  
Functional Development  
and Data Management  
BMW AG



**Morten  
HUBER**

CATIA Industry  
Process Consultant  
Dassault Systèmes



**Florian  
HÜBLER**

Industry Process  
Consultant  
Dassault Systèmes

# PLATFORM SIMULATION IN ELECTRICAL ENGINE DEVELOPMENT

SEAMLESS DATA FLOW FROM REQUIREMENTS TO ASSEMBLY PLANNING



# WELCOME.



**Florian Hübler (3DS)**

Industry Process Consultant  
SIMULIA



**Morten Huber (3DS)**

Industry Process Consultant  
CATIA Systems

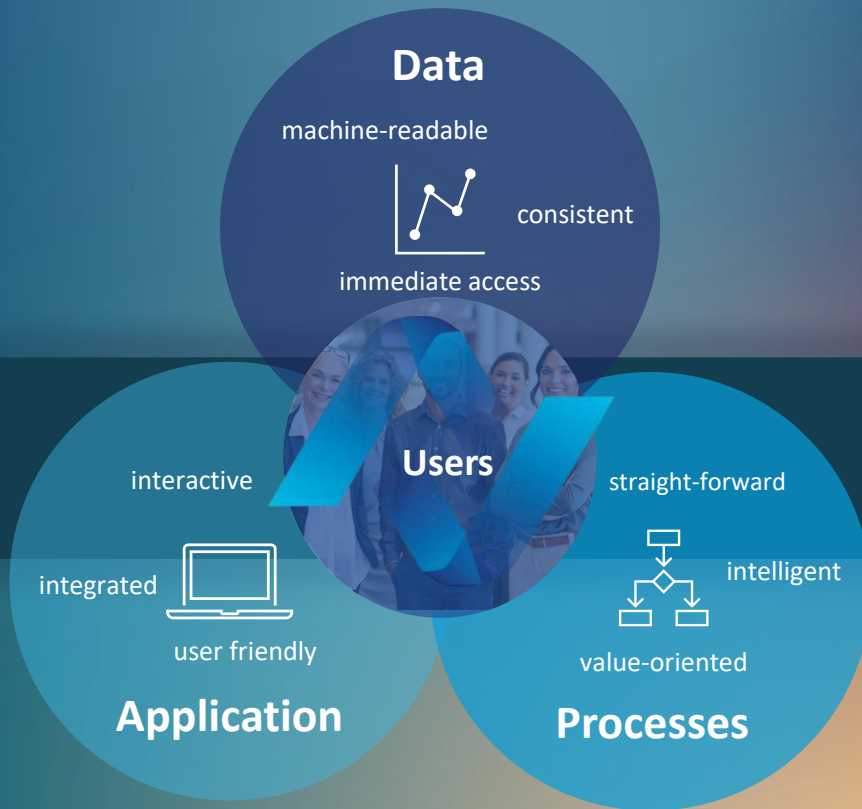


**Nicolas Brossardt (BMW)**

Project Lead  
Platform Simulation (PLASIM)

# KEYNOTE BMW.

Digitalization of our operating system.



Strengthening the core value creation.

## DIGITAL ART OF ENGINEERING.

# WHAT IS THE PLATFORM SIMULATION (PLASIM) VISION?

**“THE NEW HOW”**  
is powered  
by simulation.



We guarantee a single point of truth.



We live data consistency.



We enable collaboration.



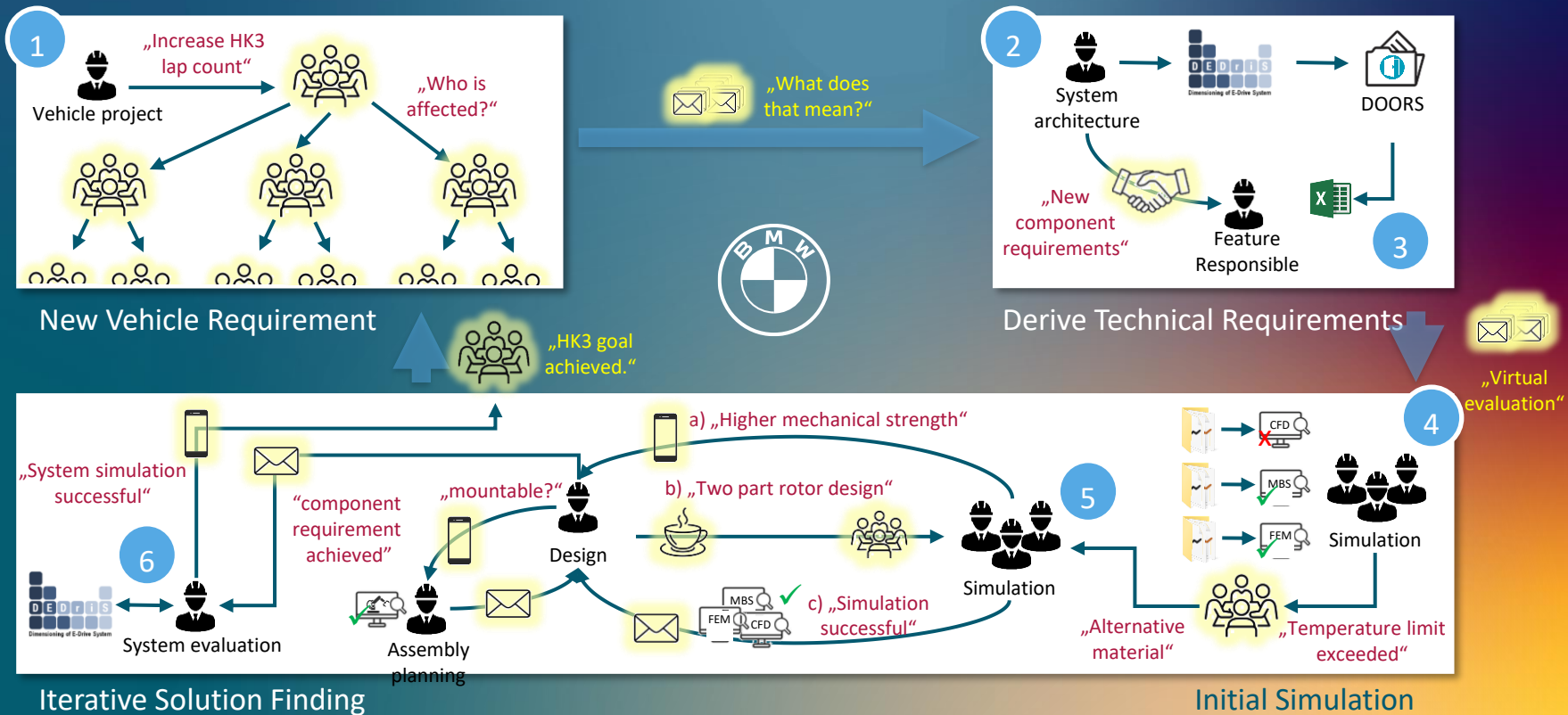
We master concept variants.



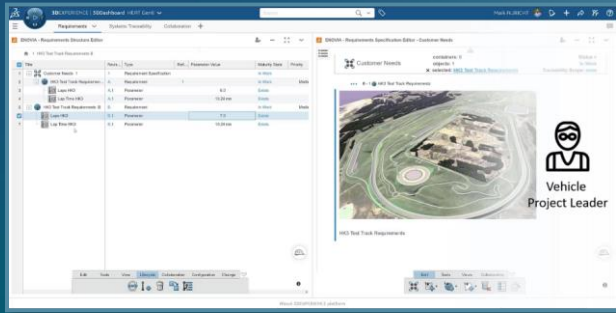
We are up to date.



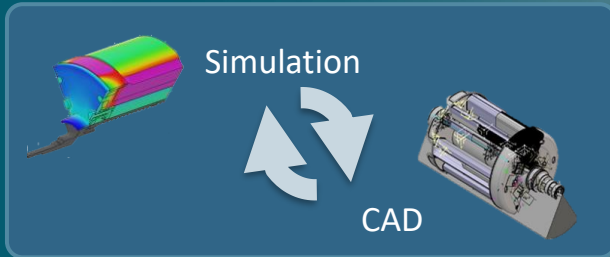
# PLASIM POC HEAT: SCENARIO.



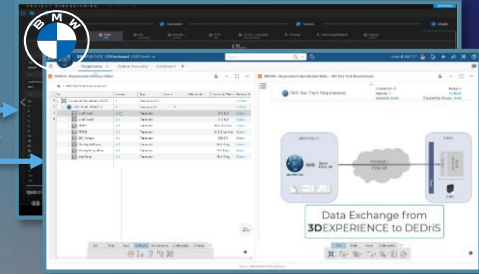
# PLASIM POC HEAT: VISION.



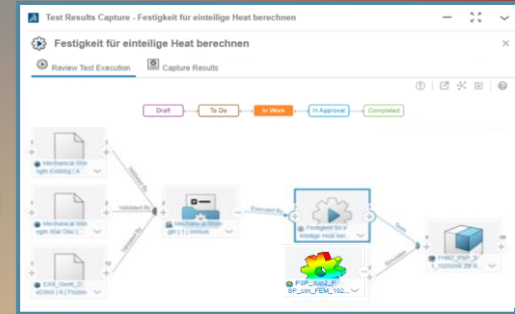
New Vehicle Requirement



Iterative Solution Finding



Derive Technical Requirements



Initial Simulation

# DEMO: New Vehicle Requirement.

The screenshot shows two side-by-side windows from the ENOVIA software. The left window, titled 'Requirements Structure Editor', displays a hierarchical tree of requirements. The right window, titled 'Requirements Specification Editor - Stakeholder Needs', shows the details of a specific requirement.

Title	Parameter V...	Revision	Type
Stakeholder Needs 1		1	Requirement Specification
High-Level Anforderung 1		1	Chapter
HK3 Test Track Requirement A		A	Requirement
Rundenzeit HK3	6	A.1	Parameter
Rundenzeit HK3	10.24 s	A.1	Parameter

**1 - High-Level Anforderung**

1 - 1 HK3 Test Track Requirement

Das Fahrzeug soll eine Rundenzeit von 6 Runden mit einer Rundenzeit von 10.24s bewältigen können.



Vehicle  
Project Leader

Vehicle  
requirement

New vehicle  
requirement



# DEMO: Derive Technical Requirements.

The screenshot displays the 3DEXPERIENCE Systems Synthesis interface. The top navigation bar includes 'Requirements' and 'Traceability' tabs. The main workspace is divided into four vertical panels: 'Requirement', 'Functional', 'Logical', and 'Product'. The 'Requirement' panel shows a 'High-Level Anforderung' requirement. The 'Functional' panel is highlighted with a dashed blue border and contains a head-and-gears icon. Below these panels is a 'Validation & Verification' section. On the right, a table lists requirements:

Name	Rev.	Title	Description
rsp-R1132100206868-00003997	1	Stakeholder Needs	
chp-R1132100206868-00003819	1	High-Level Anforderung	
req-R1132100206868-00018295	B	HK3 Test Track Requirement	Das Fahrzeug soll eine Rundenzeit von 7 Runden mit einer Rundenzeit von 10.24s bewältigen können.

Below the table is an image of a race track. The bottom status bar shows 'ENOVIA - 3D Navigate'.



System Architect

Impact Analysis

System-Simulation

Technical requirement

# DEMO: Derive Technical Requirements.

The screenshot displays two side-by-side windows from the ENOVIA software suite. The left window, titled 'ENOVIA - Requirements Structure Editor', shows a tree view of requirements under 'Stakeholder Needs 1'. The right window, titled 'ENOVIA - Requirements Specification Editor - Stakeholder Needs', shows a detailed view of a requirement titled '1 - High-Level Anforderung'. The requirement text states: '1 - 1 HK3 Test Track Requirement. Das Fahrzeug soll eine Rundenzahl von 7 Runden mit einer Rundenzeit von 10.24s bewältigen können.' Below the text is an aerial photograph of a racetrack.

Title	Parameter V...	Revision	Type
1 Stakeholder Needs 1		1	Requirement Specification
2 High-Level Anforderung 1		1	Chapter
3 HK3 Test Track Requirement B		B	Requirement
4 Rundenzahl HK3	7	B.1	Parameter
5 Rundenzeit HK3	10.24 s	B.1	Parameter



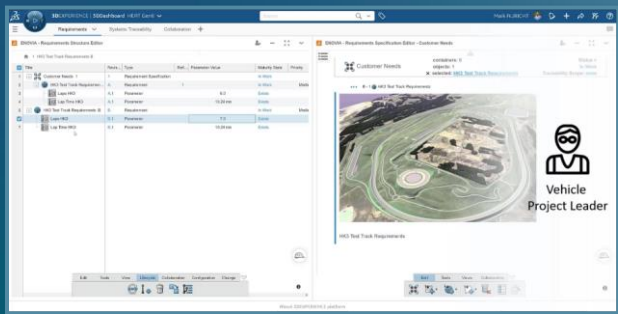
System  
Architect

Impact  
Analysis

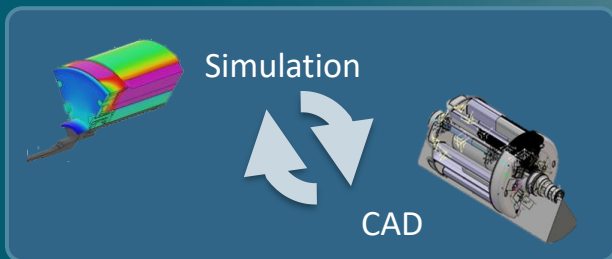
System-  
Simulation

Technical  
requirement

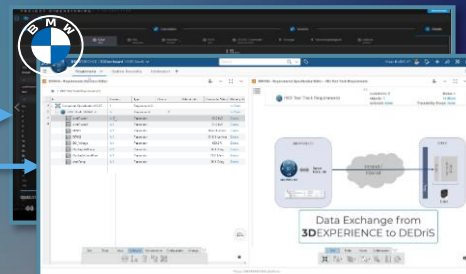
# PLASIM POC HEAT: VISION.



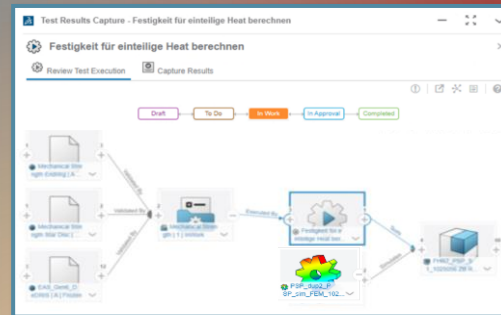
New Vehicle Requirement



Iterative Solution Finding



Derive Technical Requirements



Initial Simulation

# DEMO: Check Test Plan with New Requirement.

The screenshot shows the 3DEXPERIENCE software interface. The top navigation bar includes the 3DEXPERIENCE logo, the user name 'Florian Huebler', and various icons. The main content area is divided into several panels:

- Test Plan for HEAT EAS Gen6:** A table listing requirements with columns for Title, Maturity, and Status.
- First Simulation Run:** A panel showing the status of a simulation run, including a flow diagram and test result data.
- ENOVIA - 3D Markup:** A panel for managing 3D markup.
- ENOVIA - Collaborative Lifecycle:** A panel for managing the collaborative lifecycle.

Title	Maturity	Status
Testplan for HEAT EAS Gen6	In-Active	
Mechanical Strength	In-Active	
Check Mechanical Strength	Auto-Ended	Passed
First Simulation Run	In-Active	Failed
Deformation of Assembly	In-Active	
Cooling	In-Active	
Bearing Forces	In-Active	
Assembly	In-Active	

The simulation run status panel shows a flow diagram with stages: Private, In Work, Frozen, Released, and Obsolete. The status is 'Failed'. Test Result Data includes:

- PSP\_slp2\_PSP\_sim\_FEM\_1025056.ZB
- Markup\_PSP\_slp2\_PSP\_sim\_FEM\_1025056.ZB.A.1



Feature  
Responsible

Check  
Test Plan

Test failed

Order  
redesign and  
validation

# DEMO: Design Change.

The screenshot displays the 3DEXPERIENCE 3DDashboard interface. The main window shows a 'SIMULIA - Physics Simulation Review' of a 3D model of a mechanical part. The notification center on the right lists several messages:

- 11 nicht gelesene Benachrichtigungen
- HEUTE
- 17:21 Florian Huebler hat Ihnen ein Problem zugewiesen **Aenderung Stuetzring 1->2-teilig**
- 17:21 Florian Huebler hat die Faelligkeit des Problems **Aenderung Stuetzring 1->2-teilig** in Ausstehend geaendert.
- MO., 07. NOV. 2022
- 15:31 FH Florian Huebler moechte das folgende Live-Dashboard fuer Sie als **Eigentuer** freigeben: **HEAT Demo**
- 10:55 PS Die Rolle **Test Manager** wurde Ihnen gewaehrt. Wenn Sie mit der Rolle beginnen moechten, klicken Sie auf den Compass.
- FR., 14. OKT. 2022
- 12:21 PS Die Rolle **Fluid Dynamics Engineer** wurde Ihnen gewaehrt. Wenn Sie mit der Rolle beginnen moechten, klicken Sie auf den Compass.
- FR., 09. SEPT. 2022
- 15:58 PS Die Rolle **Structural Analysis Engineer** wurde Ihnen gewaehrt. Wenn Sie mit der Rolle beginnen moechten, klicken Sie auf den Compass.
- 15:57 PS Die Rolle **Multidisciplinary Optimization Engineer** wurde Ihnen gewaehrt. Wenn Sie mit der Rolle beginnen moechten, klicken Sie auf den Compass.



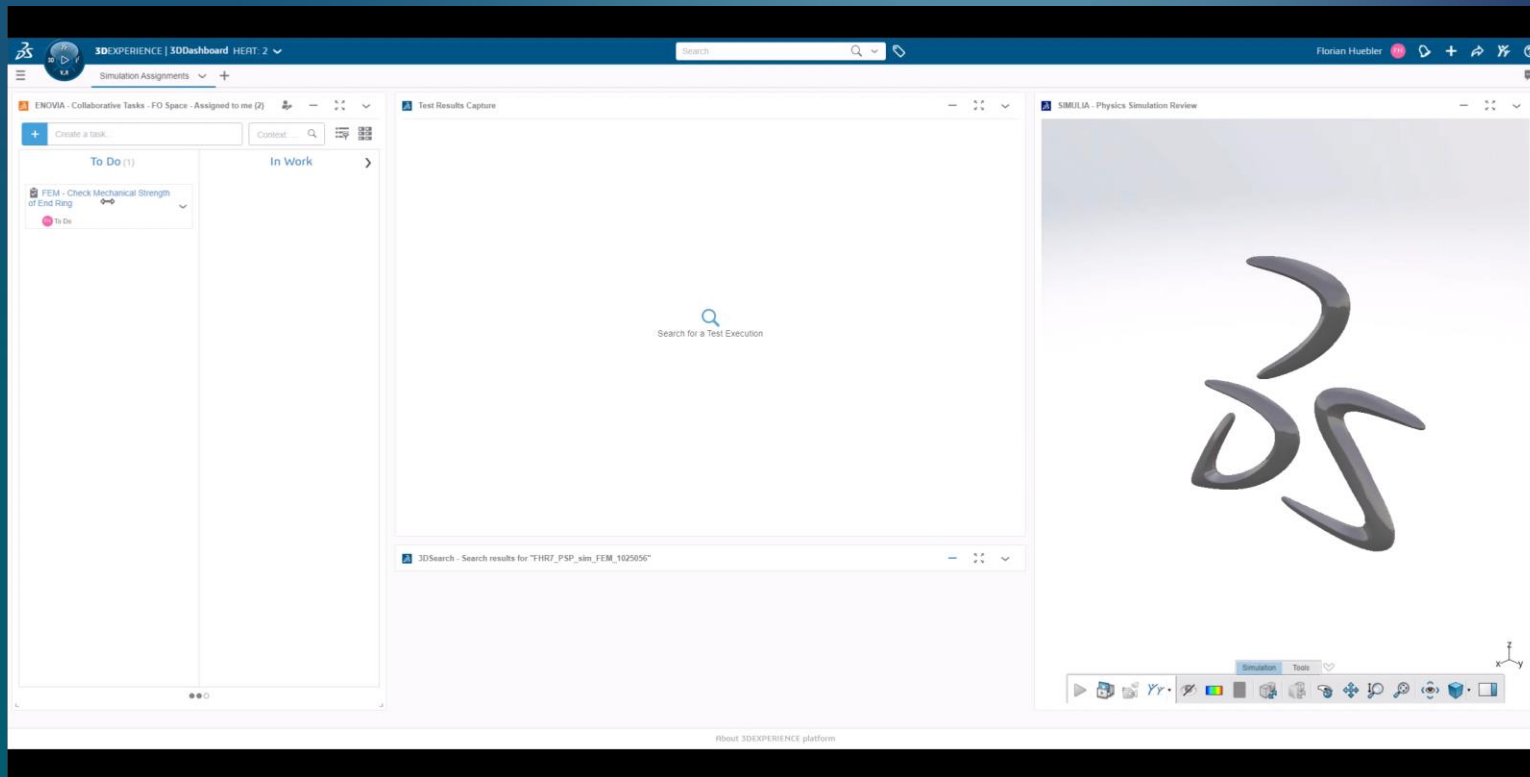
Design

Receive  
design task

Replace part  
in assembly

Mark task as  
complete

# DEMO: Initial Simulation.



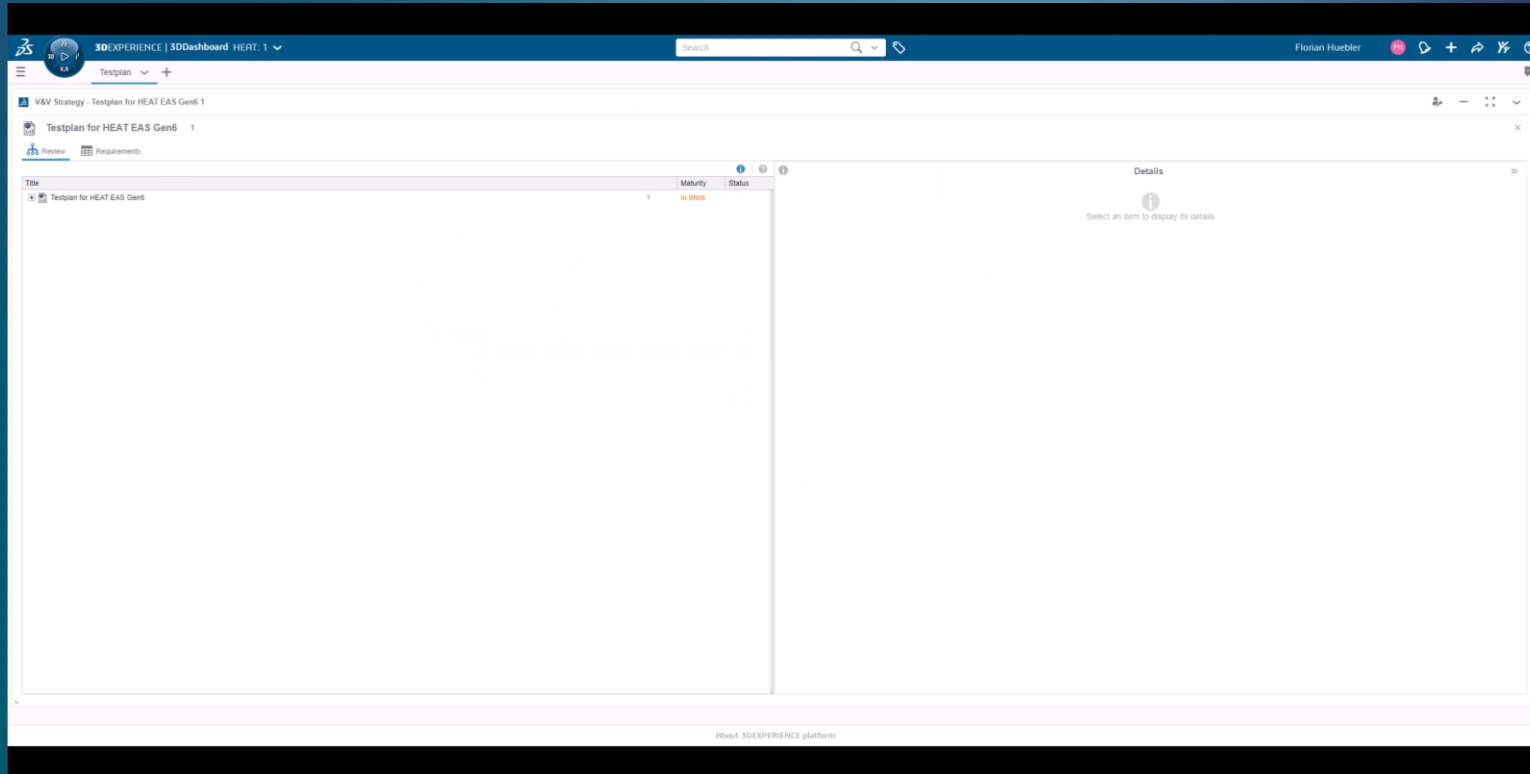
Simulation

Receive task  
+ data

Revised  
design for  
Simulation

Attach  
results

# DEMO: Iterative Solution Finding.



Feature  
Responsible

Check  
Test Plan



...



1

Stage  
"MODSIM"



3DX OOTB  
functionality.

2

Stage  
"Chances"



Link to existing  
CAE world.

3

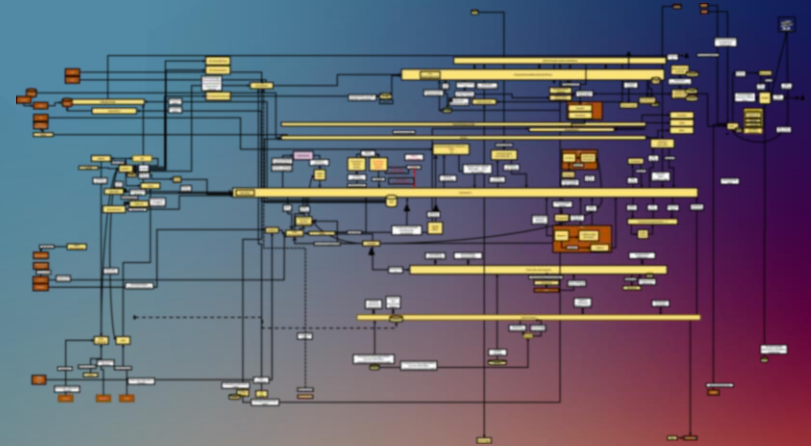
Stage  
"Vision"



Connected  
Engineering.



## Seamless INTEROPERABILITY and flexible INTEGRATION in our Engineering Platform.



*“SIMULIA will be the new unified, open platform supporting all simulation domains.”*  
Bernard Charlès, 2005

Support of Third Party Formats

Full API Access through Web Interfaces



Mesh Based Morphing

Comprehensive Functional Data Management

Reliable Releases

THANK YOU FOR YOUR INTEREST

