

**Groundbreaking
Simulation Solutions**

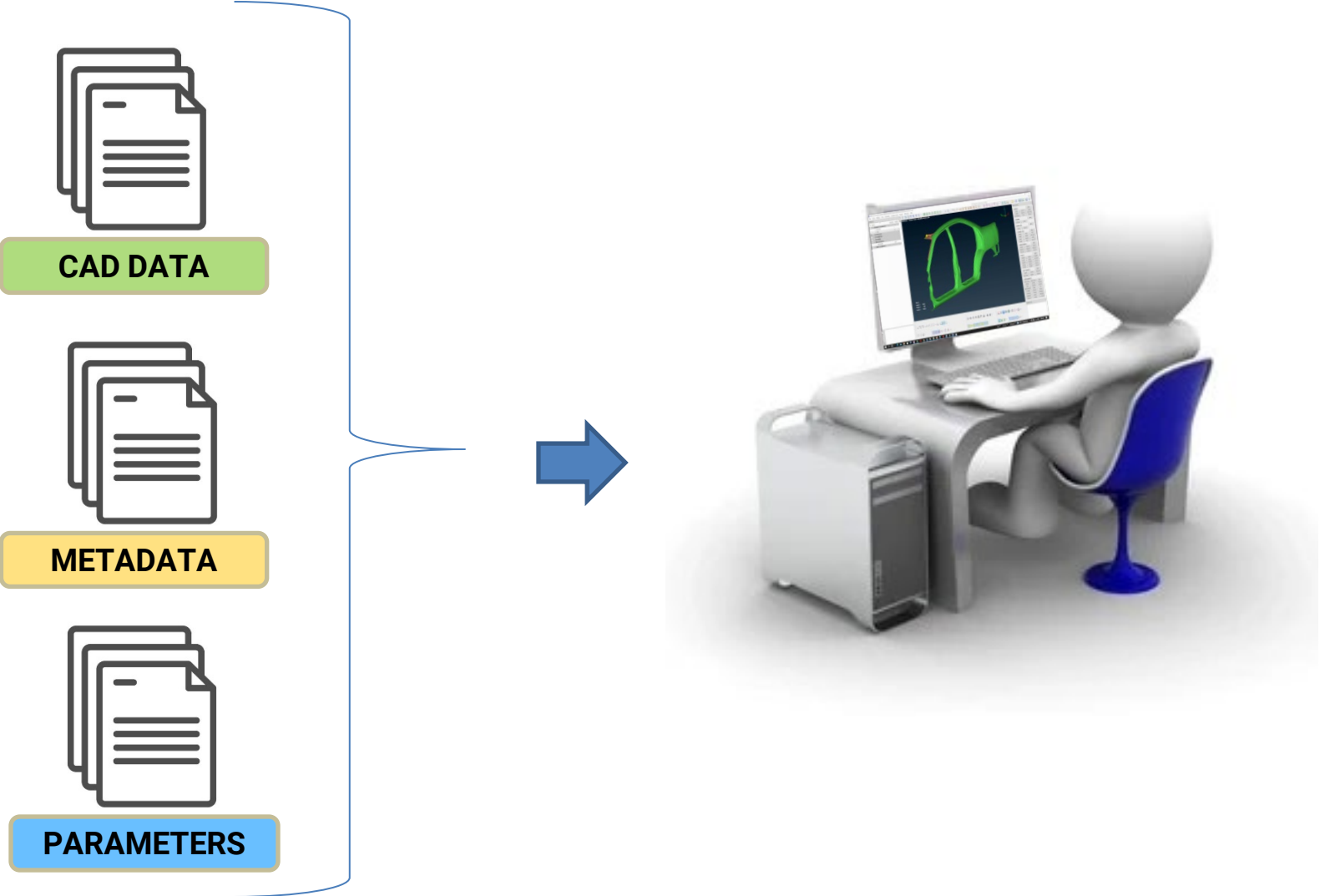
physics on screen

Addressing challenges in the BiW model build-up process in AUDI AG

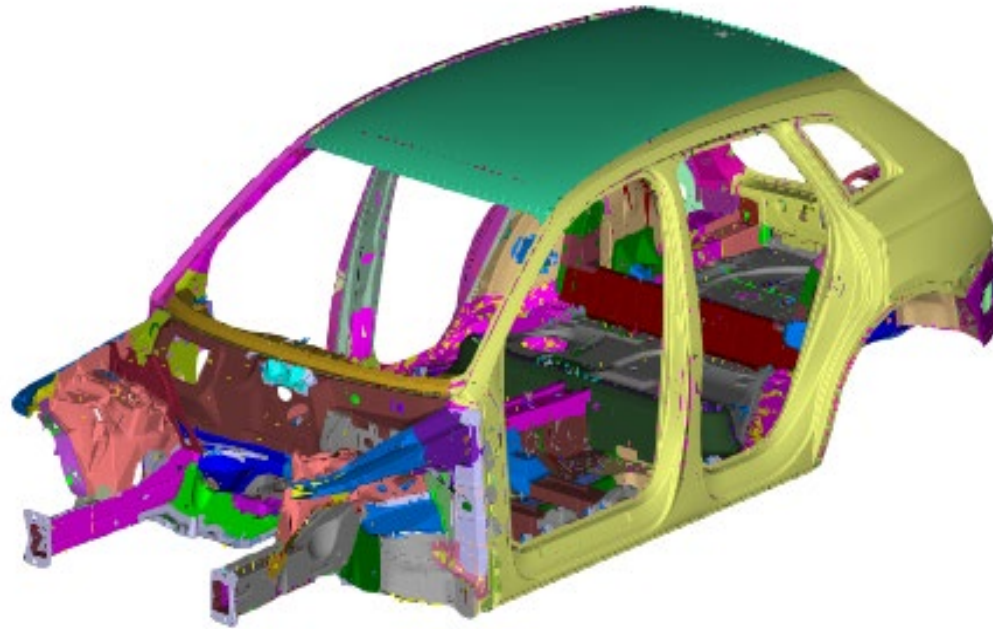
Athanasios Fassas BETA CAE Systems

Richard Lindner AUDI AG

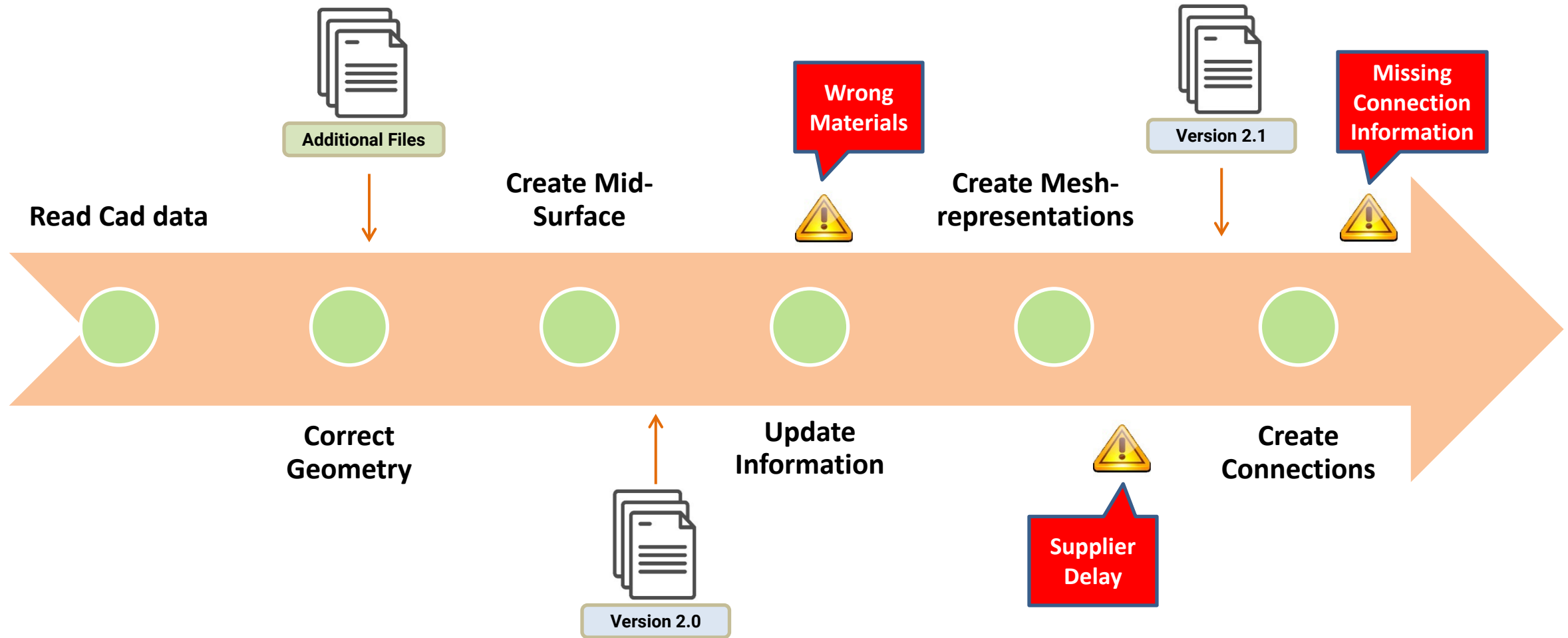
Ideal BIW-Process



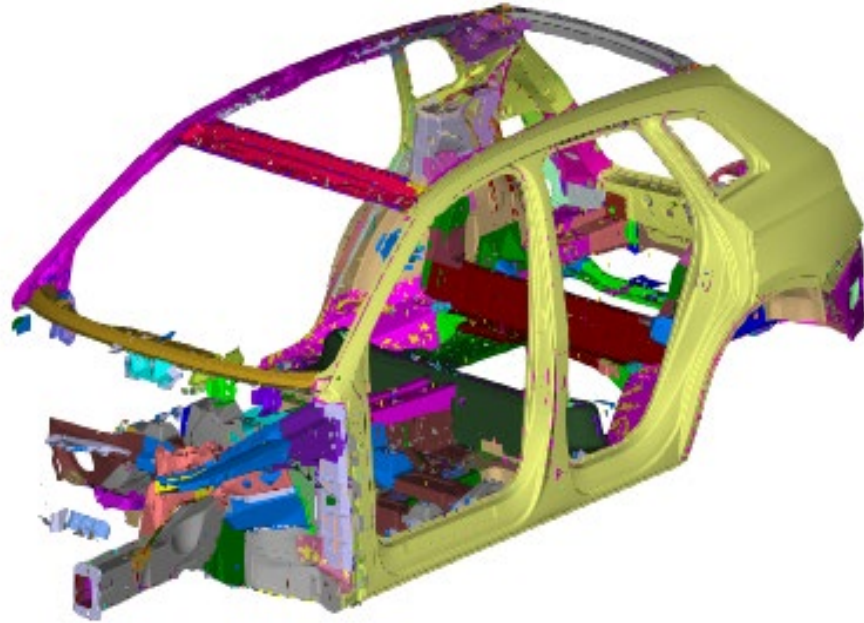
Ideal BIW-Process



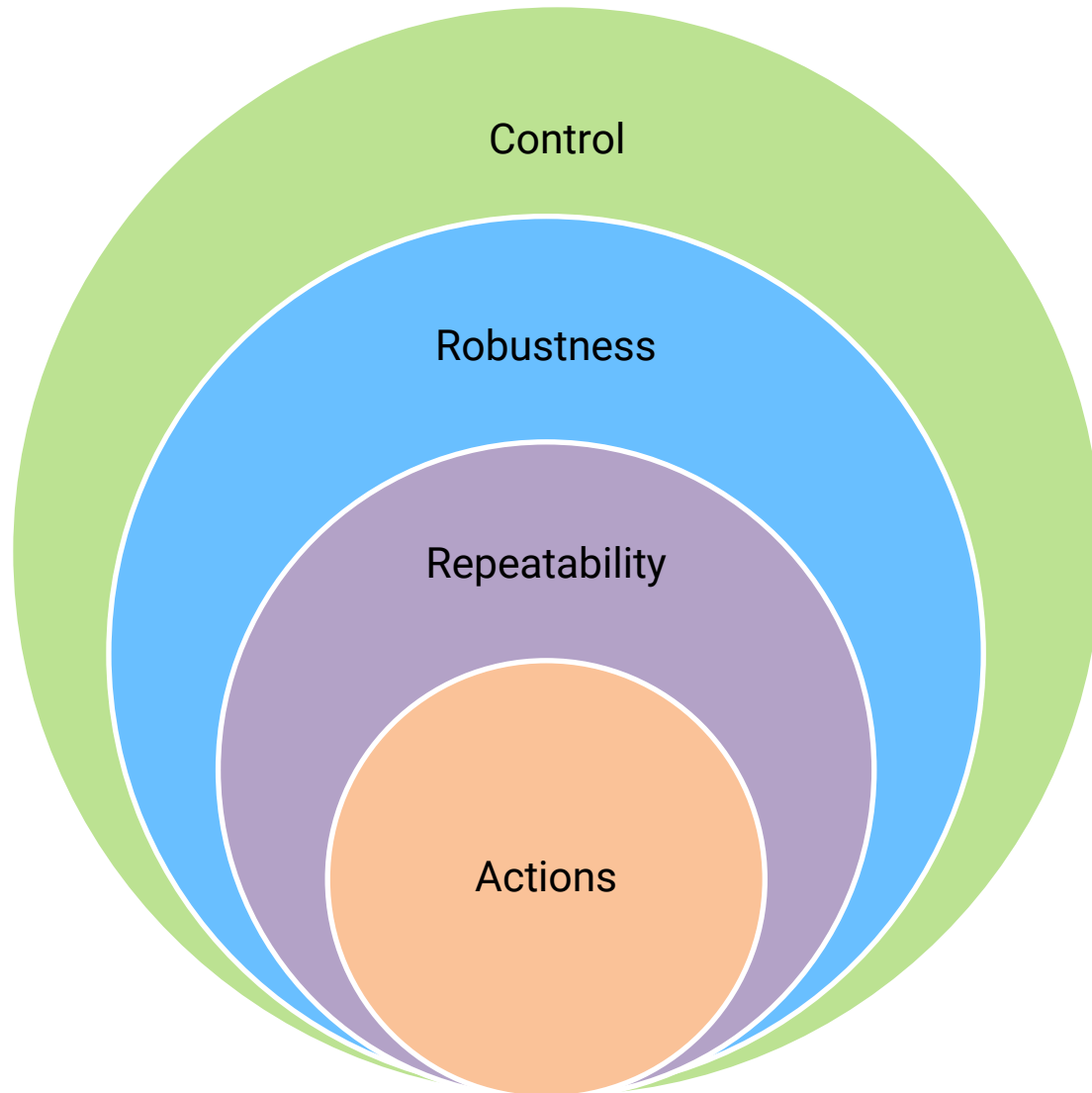
Real BIW-Process



Real BIW-Process



What we need



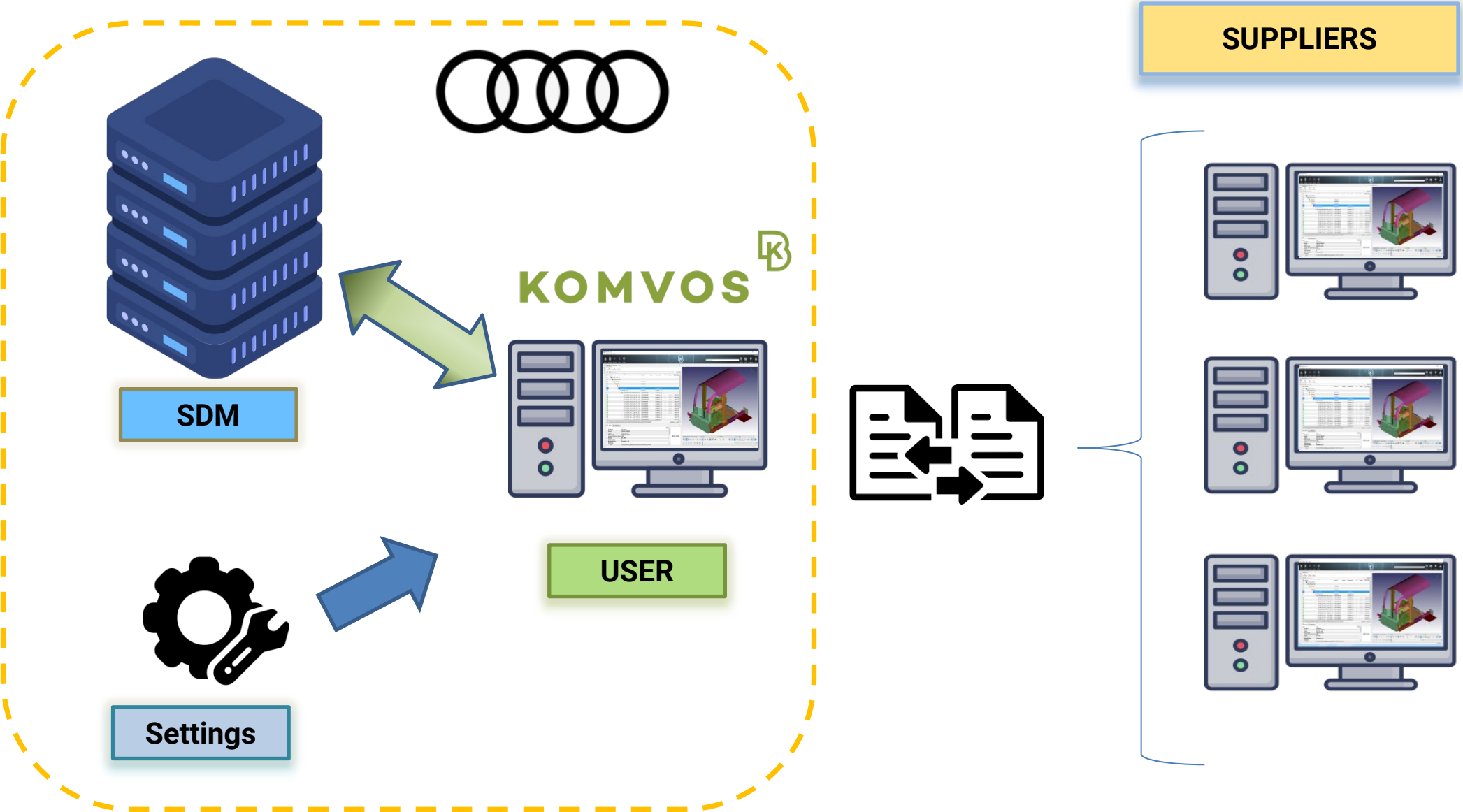
Identify problems
Communication with user

User independent process
Data Traceability

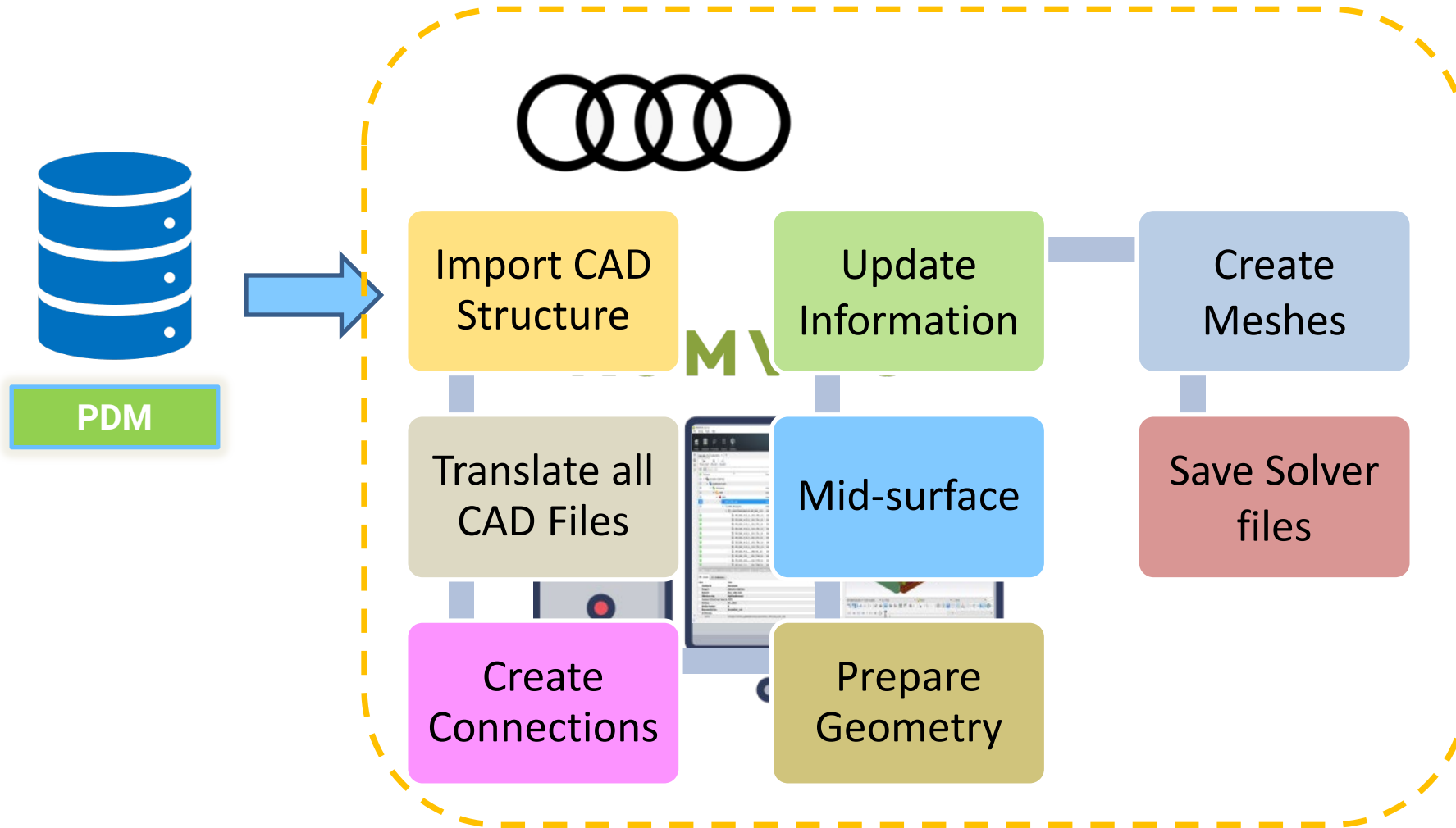
Pre-defined:
Action Scripts
Parameters and Settings

Process Analysis
Communication with Data-
systems

Architecture



Define Actions



Reading CAD data

The screenshot displays a CAD software interface with two main windows: Part Manager and META Viewer.

Part Manager: Shows a hierarchical tree structure of parts. A yellow callout box with the text "Save Subsystem" is overlaid on the tree. At the bottom, a summary table is visible:

Parts	1244	Part Files	2459
Found in DM	539	File exists	0
Not found in DM	143	File does not exist	2459

A "Check in DM" button is located below the table.

META Viewer: Displays a 3D model of a car chassis, showing various components in different colors (red, green, purple, blue).

Create BIW Subsystem

Subsystems × +

Where Used Lifecycle Iteration

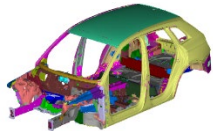
Search in DM

Contents	Module Id	Representation	PID	Thickness
▼ AU426_0ME				
▼ PRAEZISE				
▼ Karosserie	Karosserie			
▼ PDM	Karosserie			
▼ BXX	Karosserie			
▼ 100_ALL_LL_ND	Karosserie	translated_cad		
▼ Part Structure	Karosserie	translated_cad		
> 1K0_802_607__DMU_TM__006__GEWINDEPL...	1000LE960	translated_cad	1 1	Default M
> 1K0_802_607__DMU_TM__006__GEWINDEPL...	1000LE960	translated_cad	1 1	Default M
> 1K0_802_607__DMU_TM__006__GEWINDEPL...	1000LE960	translated_cad	1 1	Default M
> 1K0_802_607__DMU_TM__006__GEWINDEPL...	1000LE960	translated_cad	1 1	Default M
> 1K0_803_941_A__DMU_TM__002_431_MUTTERHAL...	1000Y3WD09	translated_cad	1, 2, 3 1, 1, 1	Default M
> 1K0_803_941_A__DMU_TM__003_430_MUTTERHAL...	1000Y3V272	translated_cad	1, 2, 3 1, 1, 1	Default M
> 1K0_803_941_A__DMU_TM__004_426_MUTTERHAL...	1000XMR990	translated_cad	1, 2 1, 1	Default M
> 1K0_803_941_A__DMU_TM__004_427_MUTTERHAL...	1000JXNXC86	translated_cad	1, 2 1, 1	Default M
> 1K0_803_941_A__PCA_TM__002_431_MUTTERHAL...	1000Y3WC12	translated_cad	1, 2, 3 1, 1, 1	Default M
> 1K0_803_941_A__PCA_TM__003_430_MUTTERHAL...	1000Y3V175	translated_cad	1, 2, 3 1, 1, 1	Default M
> 1K0_803_941_A__PCA_TM__004_426_MUTTERHAL...	1000XMR893	translated_cad	1, 2, 3 1, 1, 1	Default M

DM: D:/WORK/Custmrs/GERMANY/AUDI/9th_Congress/KOMVOS/data/KONFERENZ/AU426_AUDI_Q5/DATABASE/ Subsystems 2 | selected 1

Details References Changeset

Name	Value
Module Id	Karosserie
Project	AU426_0ME
Variant	100_ALL_LL_ND
Milestone leg	PRAEZISE
Connect Structure Source	PDM
Version	XX_2023
Study Version	0
Representation	translated_cad
Attributes	
Name	AU426_0ME_PRAEZISE_Karosserie_PDM_100_AL



Create BIW Subsystem

The screenshot displays the ANSYS Workbench Subsystems environment. The top toolbar includes 'Where Used', 'Lifecycle', and 'Iteration' buttons. A search bar is present with the text 'Search in DM'. The main area shows a tree view of the subsystem structure:

- Contents
 - AU426_0ME
 - PRAEZISE
 - Karosserie
 - PDM
 - BXX
 - 100_ALL_LL_ND (Selected)

The selected item '100_ALL_LL_ND' has a context menu open, listing the following actions:

- Open in ANSA
- Open specific repr in ANSA
- Translate CAD
- Prepare For Midsurface
- Create Midsurface
- Distribute Information
- Create Common
- Run Batchmesh
- Run sequence of actions

Below the tree view, the 'Details' panel shows the following properties for the selected subsystem:

Name	Value
Module Id	Karosserie
Project	AU426_0ME
Variant	100_ALL_LL_ND
Milestone leg	PRAEZISE
Connect Structure Source	PDM
Version	XX_2023
Study Version	0
Representation	translated_cad
Attributes	
Name	AU426_0ME_PRAEZISE_Karosserie_PDM_100_AL

On the right side of the details panel, a 3D model of a car body is shown in a semi-transparent view, highlighting the internal structure.

Execute actions

Translate CAD - Subsystem: Sonder_digKF_Karosserie_TDM_ECE_150

DM	Status	Error	Module Id	Name	General note	Part File
<input checked="" type="checkbox"/>	<input type="radio"/>	missing translated_cad	100034P5P398	8V0_809_237__PCA_T...	Geometry	..._M8_SAEU_LE_B_20190218.CATPart
<input checked="" type="checkbox"/>	<input type="radio"/>	missing translated_cad	10002TECC728	8V0_809_237__PCA_T...	Geometry	..._M8_SAEU_LE_B_20190218.CATPart
<input checked="" type="checkbox"/>	<input type="radio"/>	missing translated_cad	10002TD34072	8W0_809_625_A_PCA_T...	Geometry	...RST_S_A_UNTEN_20190208.CATPart
<input checked="" type="checkbox"/>	<input type="radio"/>	missing translated_cad	10002TD3TM32	8W0_809_625_A_PCA_T...	Geometry	...RST_S_A_UNTEN_20190208.CATPart
<input checked="" type="checkbox"/>	<input type="radio"/>	missing translated_cad	10002TEC3707	8W0_810_727__PCA_T...	Geometry	...EIL_2__S_B_INNEN_20181130.CATPart
<input checked="" type="checkbox"/>	<input type="radio"/>	missing translated_cad	10002TD16903	8W0_810_727__PCA_T...	Geometry	...EIL_2__S_B_INNEN_20190114.CATPart
<input checked="" type="checkbox"/>	<input type="radio"/>	missing translated_cad	10002Y7XPD23	85H_800_401__VEE_V...	Connections	...EQ5_HUT_.CATPart
<input checked="" type="checkbox"/>	<input type="radio"/>	missing translated_cad	10002Y7XPM93	85H_800_414__VEE_V...	Connections	...ERIE_AUFBA_U_1_2_.CATPart
<input checked="" type="checkbox"/>	<input type="radio"/>	missing translated_cad	10002Y7XPR78	85H_800_415__VEE_V...	Connections	...ERIE_AUFBA_U_3_.CATPart
<input checked="" type="checkbox"/>	<input type="radio"/>	missing translated_cad	10002Y7XR293	85H_800_416__VEE_V...	Connections	...ERIE_AUFBA_U_4_5_.CATPart
<input checked="" type="checkbox"/>	<input type="radio"/>	missing translated_cad	10002Y7XR584	85H_800_725__VEE_V...	Connections	...BAU_2_3_.CATPart
<input checked="" type="checkbox"/>	<input type="radio"/>	missing translated_cad	100033V54K67	85H_802_845__PCA_T...	Geometry	...AUFNAHME_20190208.CATPart
<input checked="" type="checkbox"/>	<input type="radio"/>	missing translated_cad	100033V5E118	85H_802_845__PCA_T...	Geometry	...AUFNAHME_20180208.CATPart
<input checked="" type="checkbox"/>	<input type="radio"/>	missing translated_cad	100033V5JY60	85H_802_845__PCA_T...	Geometry	...AUFNAHME_20190208.CATPart
<input checked="" type="checkbox"/>	<input type="radio"/>	missing translated_cad	100033V4Y788	85H_802_845__PCA_T...	Geometry	...AUFNAHME_20190208.CATPart
<input checked="" type="checkbox"/>	<input type="radio"/>	missing translated_cad	10002TELL474	85H_803_087__PCA_T...	Geometry	...EL_POS_V_20190208.CATPart
<input checked="" type="checkbox"/>	<input type="radio"/>	missing translated_cad	10002TELN026	85H_803_088__PCA_T...	Geometry	...EL_POS_V_20190208.CATPart
<input checked="" type="checkbox"/>	<input type="radio"/>	missing translated_cad	1000281EWW05	85H_803_857__PCA_T...	Geometry	...GSWINKEL_20190208.CATPart
<input checked="" type="checkbox"/>	<input type="radio"/>	missing translated_cad	1000281EWY96	85H_803_858__PCA_T...	Geometry	...GSWINKEL_20190208.CATPart
<input checked="" type="checkbox"/>	<input type="radio"/>	missing translated_cad	10002TET5K46	85H_804_475__PCA_T...	Geometry	...ENVERRI_EGELUNG_20190208.CATPart
<input checked="" type="checkbox"/>	<input type="radio"/>	missing translated_cad	10002TEWVL12	85H_804_475__PCA_T...	Geometry	...ENVERRI_EGELUNG_20190208.CATPart
<input checked="" type="checkbox"/>	<input type="radio"/>	missing translated_cad	10002TEK2665	85H_804_547__PCA_T...	Geometry	...NGSBLECH_20190208.CATPart
<input checked="" type="checkbox"/>	<input type="radio"/>	missing translated_cad	10002TEPWL45	85H_804_547__PCA_T...	Geometry	...NGSBLECH_20190208.CATPart

total 251 | selected 0

Report directory: /home/thanasis/tmp/tmpy6pt6jdh/translate_cad_report_jr8d6p9r2023-03-17_08.43.47.597178

Communication with the user

The screenshot displays a software interface with a table of Data Model (DM) items. The table has four columns: DM, Name, Geometry Status, and General note. A legend in the top left corner explains the color coding for the DM items:

- White circle: midsurface Not found in DM
- Green circle: midsurface Found in DM
- Orange circle: midsurface with geometry issues Found in DM
- Red circle: Missing ready_for_midsurface

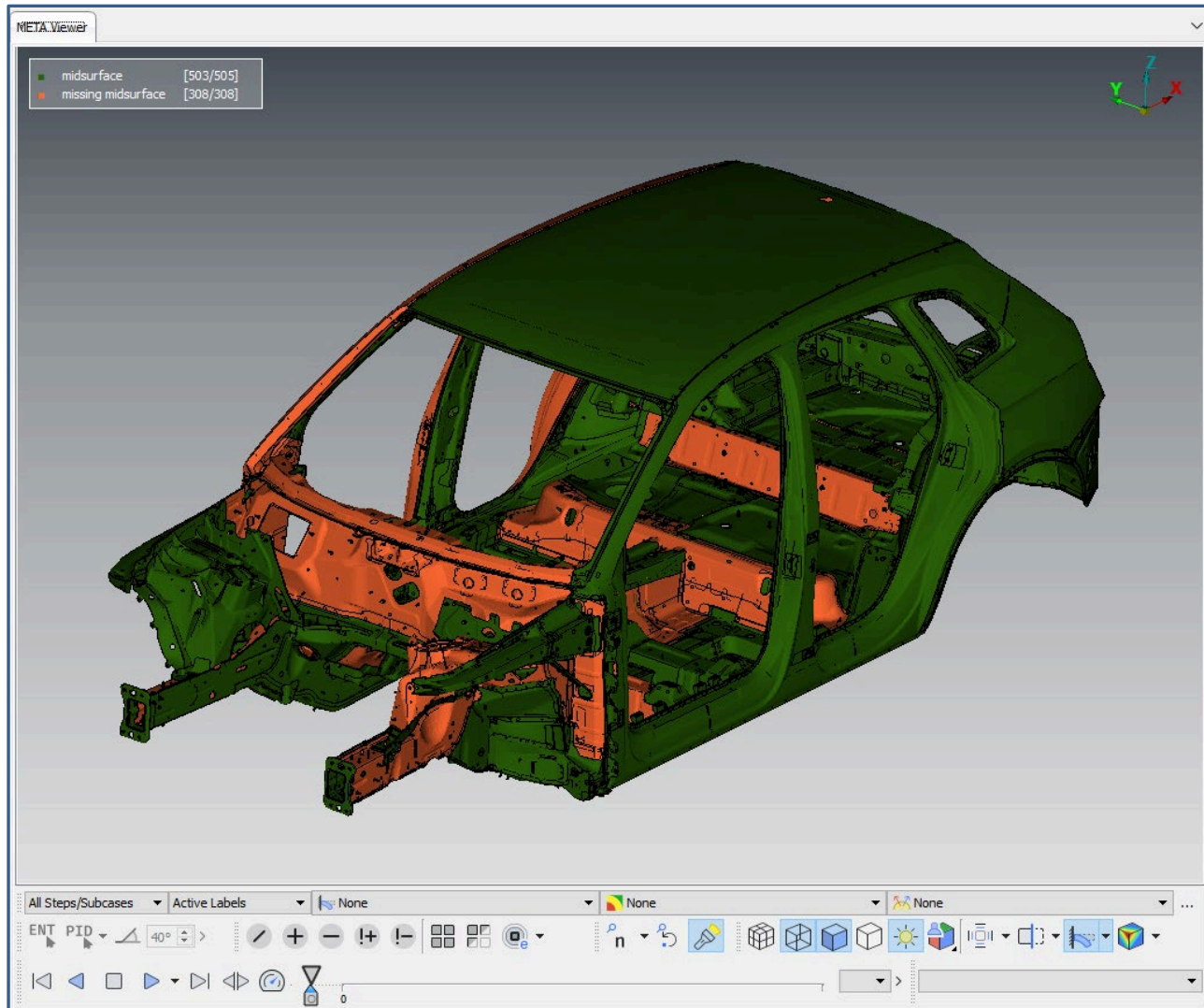
The table contains several rows, some of which are highlighted in red, indicating errors. A large red error message is overlaid on the table, reading: "Invalid right_hand_part_number! Please check geometry! Possible geometry issues!".

DM	Name	Geometry Status	General note
<input type="checkbox"/>	: midsurface Not found in DM		Corresponding right side part : 8MA_809_820__
<input type="checkbox"/>	: midsurface Found in DM		Right side part
<input type="checkbox"/>	: midsurface with geometry issues Found in DM		Geometry
<input type="checkbox"/>	: Missing ready_for_midsurface		Geometry
<input type="checkbox"/>	midsurface exists 80A_810_221_B_PCA_TM_...	OK	Geometry
<input type="checkbox"/>	midsurface exists 80A_810_222_B_PCA_TM_...	OK	
<input type="checkbox"/>	midsurface exists 8MA_809_227_PCA_TM_...	OK	
<input type="checkbox"/>	midsurface exists 8MA_809_228_PCA_TM_...	OK	Right side part
<input type="checkbox"/>	midsurface exists 8MA_809_609_...		ould be...
<input type="checkbox"/>	midsurface exists 8MA_809_610_...		
<input checked="" type="checkbox"/>	missing midsurface 8V0_809_237_PCA_TM_...	OK	Geometry
<input checked="" type="checkbox"/>	missing midsurface 8V0_809_237_PCA_TM_...	OK	Geometry
<input type="checkbox"/>	missing translated_cad 2Q0_809_589_A_DMU_TM_...		Geometry
<input type="checkbox"/>	missing translated_cad 8MA_803_788_PCA_TM_...		Geometry
<input type="checkbox"/>	missing translated_cad 8MA_805_313_PCA_TM_...		Geometry
<input type="checkbox"/>	missing translated_cad 8MA_809_150_PCA_TM_...		Geometry
<input type="checkbox"/>	missing translated_cad 8MA_809_286_PCA_TM_...		Geometry
<input type="checkbox"/>	missing translated_cad 8MA_809_308_PCA_TM_...		Geometry

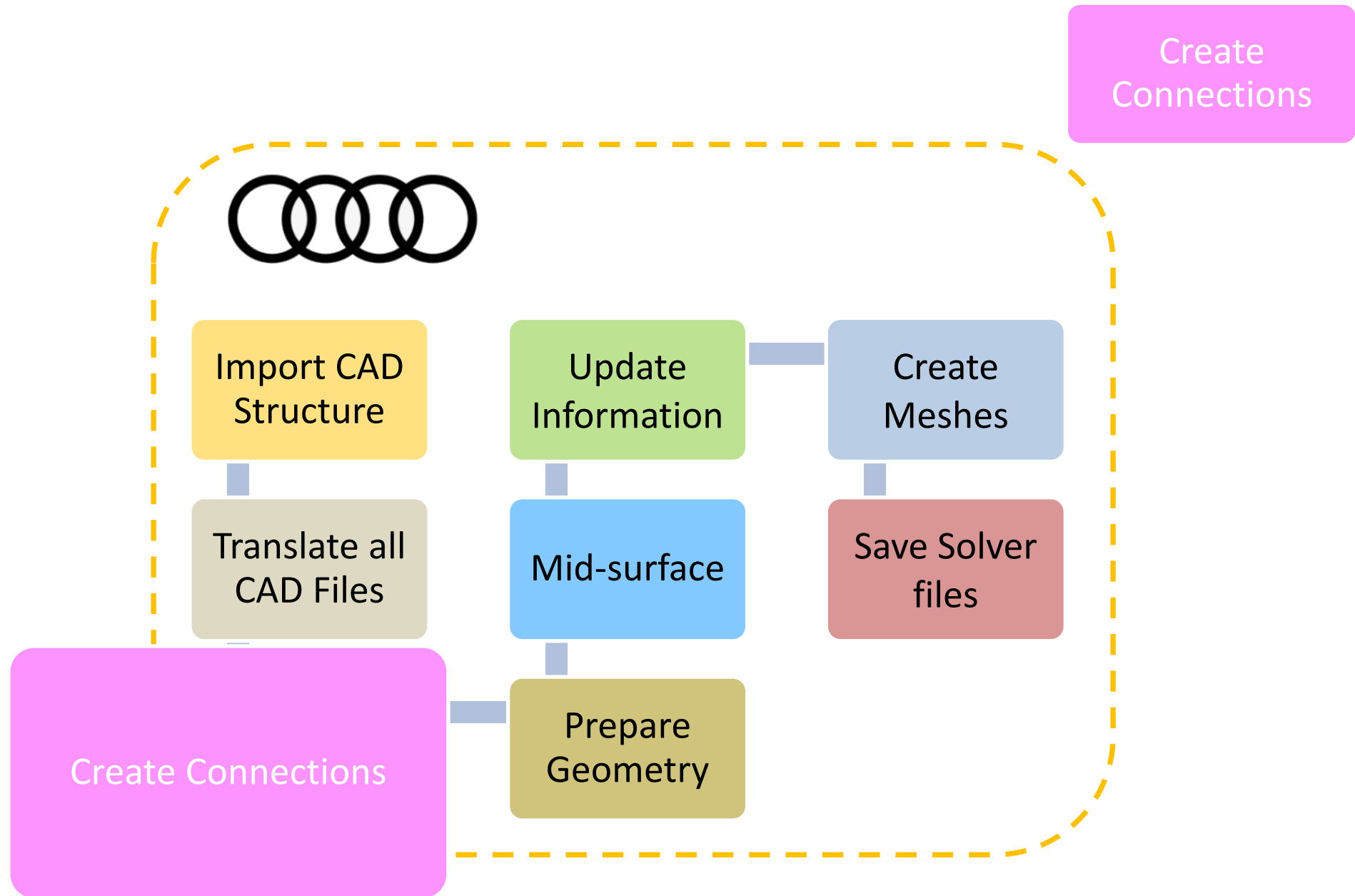
total 69 | selected 0

Report directory: > Start Refresh

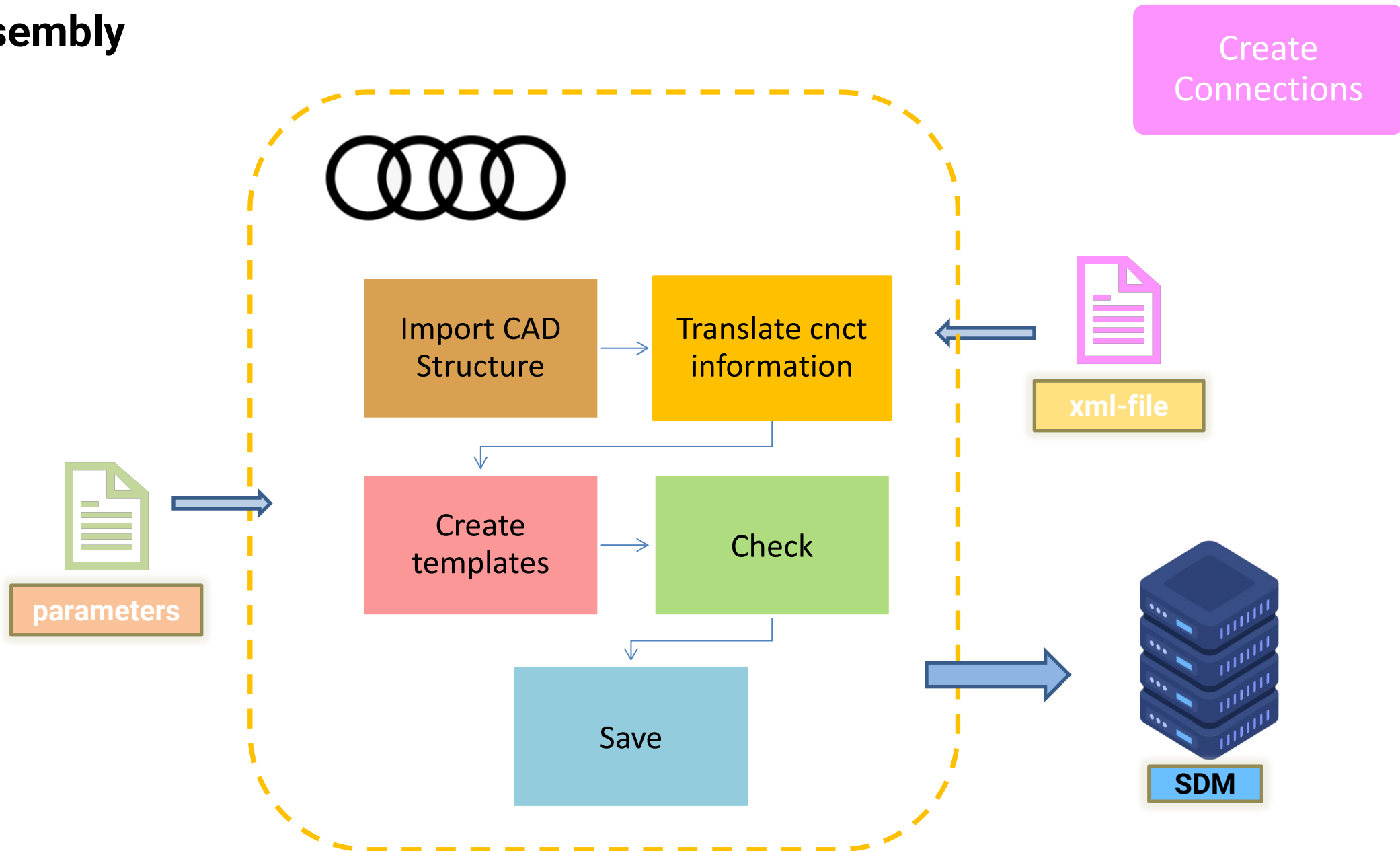
Check the integrity



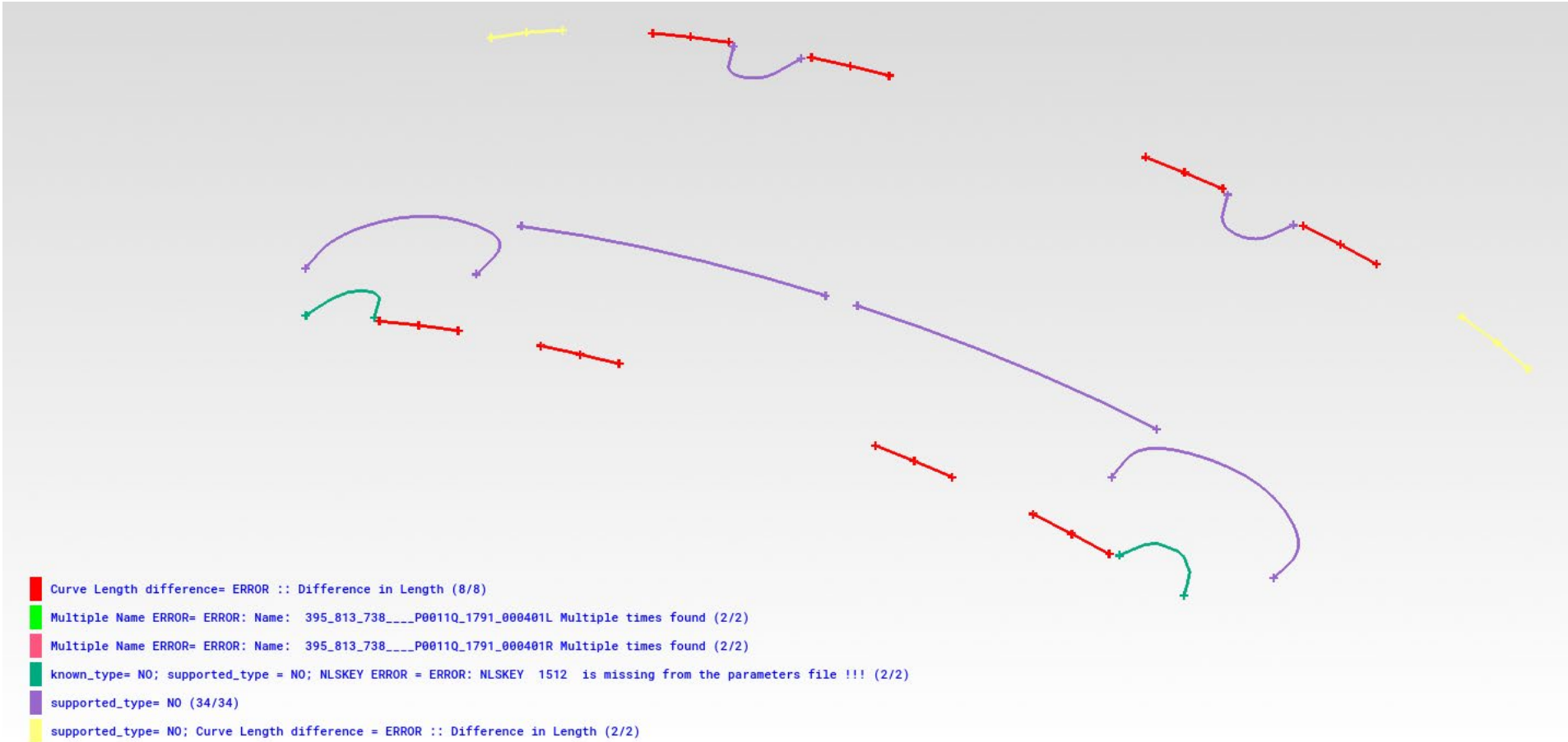
Assembly



Assembly



Check Connections Validity



Manual update

The screenshot shows a CAD software interface with a tree view of a car body assembly. The tree view is expanded to show the '100_ALL_LL_ND' part structure. A context menu is open over the '100_ALL_LL_ND' part, listing various actions such as 'Open in ANSA', 'Open specific repr in ANSA', 'Translate CAD', 'Prepare For Midsurface', 'Create Midsurface', 'Distribute Information', 'Create Common', 'Run Batchmesh', and 'Run sequence of actions'. The 'Open in ANSA' and 'Open specific repr in ANSA' options are highlighted with a red box.

Name	Value
Module Id	Karosserie
Project	AU426_0ME
Variant	100_ALL_LL_ND
Milestone leg	PRAEZISE
Connect Structure Source	PDM
Version	XX_2023
Study Version	0
Representation	translated_cad
Attributes	
Name	AU426_0ME_PRAEZISE_Karosserie_PDM_100_AL

Manual update

The screenshot displays the ANSA v22.1.3 software interface. The main window shows a 3D model of a car body, rendered in yellow and green, with various components highlighted in different colors. The interface includes a menu bar (File, Tools, Utilities, Lists, Assembly, Analysis Tools, Plugins, Windows, Help), a toolbar, and a database panel on the left. The database panel lists various entities and their counts:

Name	Number
ANSAPART	814
ANSA_SUBSYSTEM	1
EDGE	
<input checked="" type="checkbox"/> ELEMENT	2811178 25
<input checked="" type="checkbox"/> GEOMETRY	3767497 47
<input type="checkbox"/> CONS	2465305
<input checked="" type="checkbox"/> FACE	486491 47
<input checked="" type="checkbox"/> HOT_POINT	815698
<input type="checkbox"/> WPLANE	3 0
INCLUDE	1
> MATERIAL	539
<input type="checkbox"/> NODE	2435498
<input checked="" type="checkbox"/> PROPERTY	4628
PART_SHELL	4628

The PAM-CRASH menu is open, showing various options for model preparation and analysis. The menu is organized into several sections:

- GENERAL**: Save in DM, Save Sub. Hierarchy, Save Solver Specific.
- CHECK**: Check Geometry, Check PID NAMES, Check CAD Data, Check Rhpn, Check Mesh.
- PID**: Create PID XLSX, Read PID XLSX.
- CONNECTION DM**: Load cnct repr., Save cnct repr.
- CONNECTIONS**: Update Connectivity, Replace Connectivity, Create Templates, Delete Templates, Realize Connection, Erase Fe-Rep Conn., Create CNCT Entity, Open CNCT XLSX.
- FATXML**: Create FATXML.
- NUMBERING**: RENUMBER Entities.
- MESH**: CP PARAMs from B.

The Info panel at the bottom left shows the following details:

```
Info
Shell
LAST EDIT :
HOST : AUDIINW42235153
USER : e4deg2w
DATE :31-MAY-2023 10:01:53
Creating index for tooltips from 1
Done.
```

The bottom status bar shows the current entity type as ENT PID and the view angle as 100°.

Communicate information



Model Report



Part Attributes	
Name	85H_803_209_PCA_TM_024
Module Id	10002CMTJW08
Version	025
Representation	translated_cad
User/AUDI/CHECK/CheckCadValidity/part_status	Error
User/AUDI/CHECK/CheckCadValidity/Part Message	W: Name ,E: Multi Prop
User/AUDI/CHECK/CheckCadValidity/Catia Message	E: Missing Material 3 ,E: Missing Material 4
User/AUDI/CHECK/CheckCadValidity/check_part_correct_number_vols	LO
User/AUDI/CHECK/CheckCadValidity/check_part_multi_property	UNDEF
User/AUDI/CHECK/CheckCadValidity/check_part_property_body	LO

Traceability

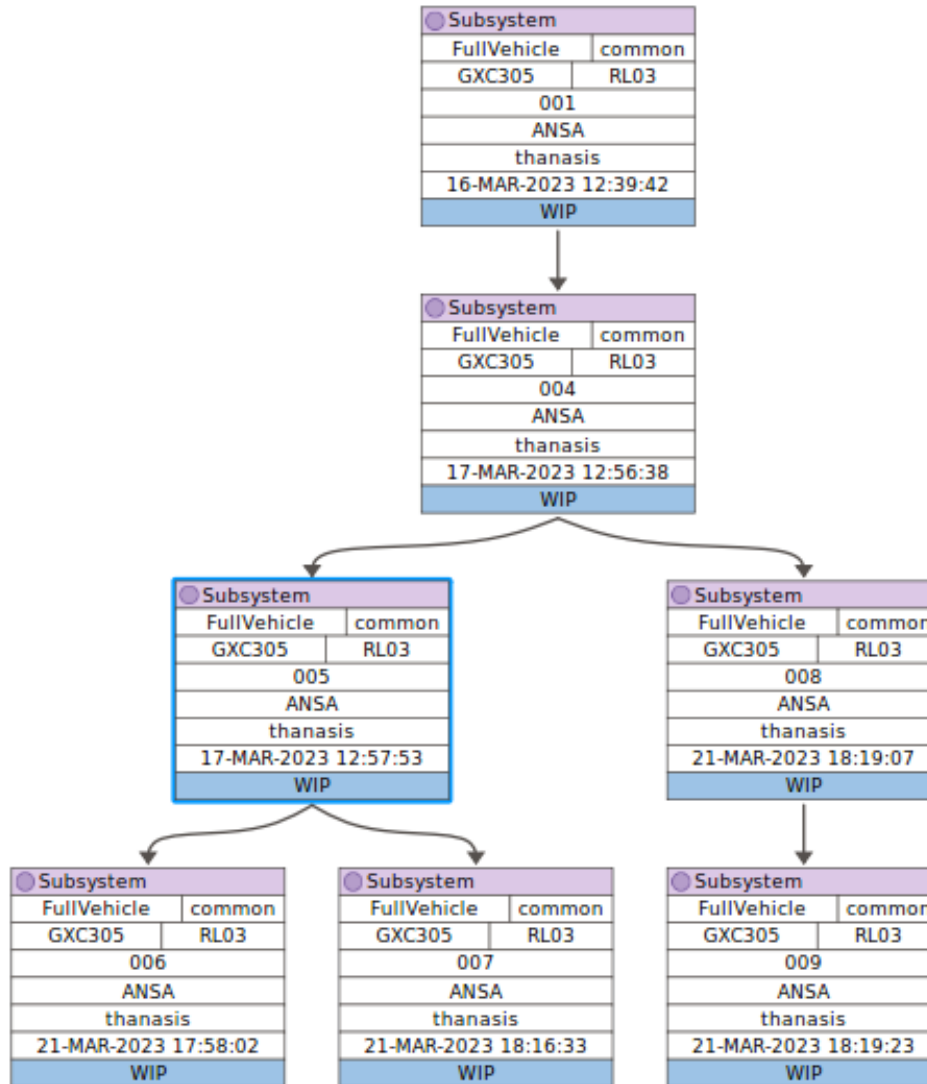
New tab X Subsystems X Lifecycle X +

Subsystem: Taurus_LHD_FW

Details References Changeset

Where Used Lifecycle Other Links

Type	Name	Reference Type	Iteration	File
●	Taurus_LHD_FW_Long previous version	004	AN	
●	Taurus_LHD_FW_Long next version	006	AN	
●	Taurus_LHD_FW_Long next version	007	AN	



Relations

- Solver Representations
- Input/Output Dependency
- Variants

Navigation

Versions

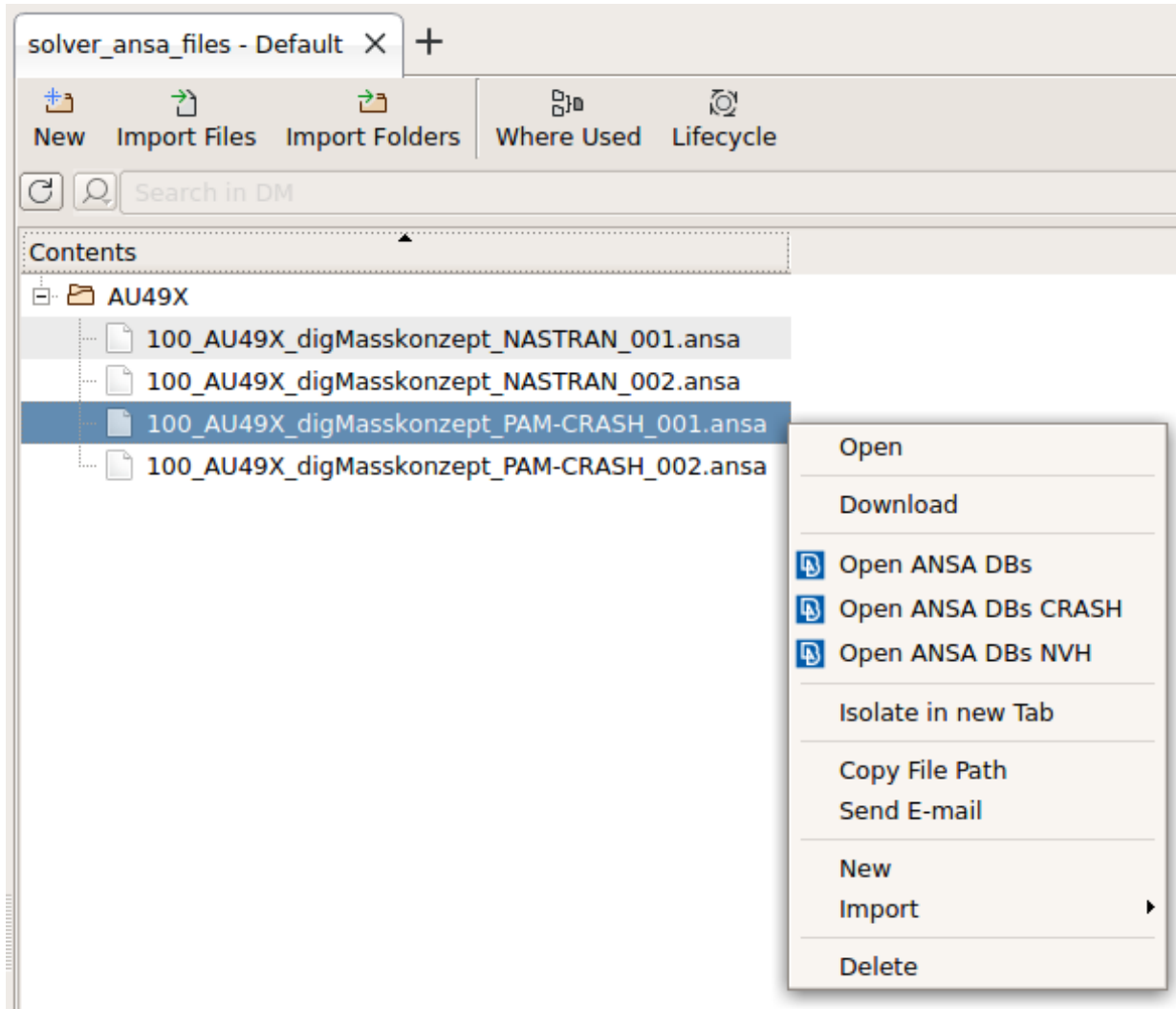
Previous Next

< << >> >

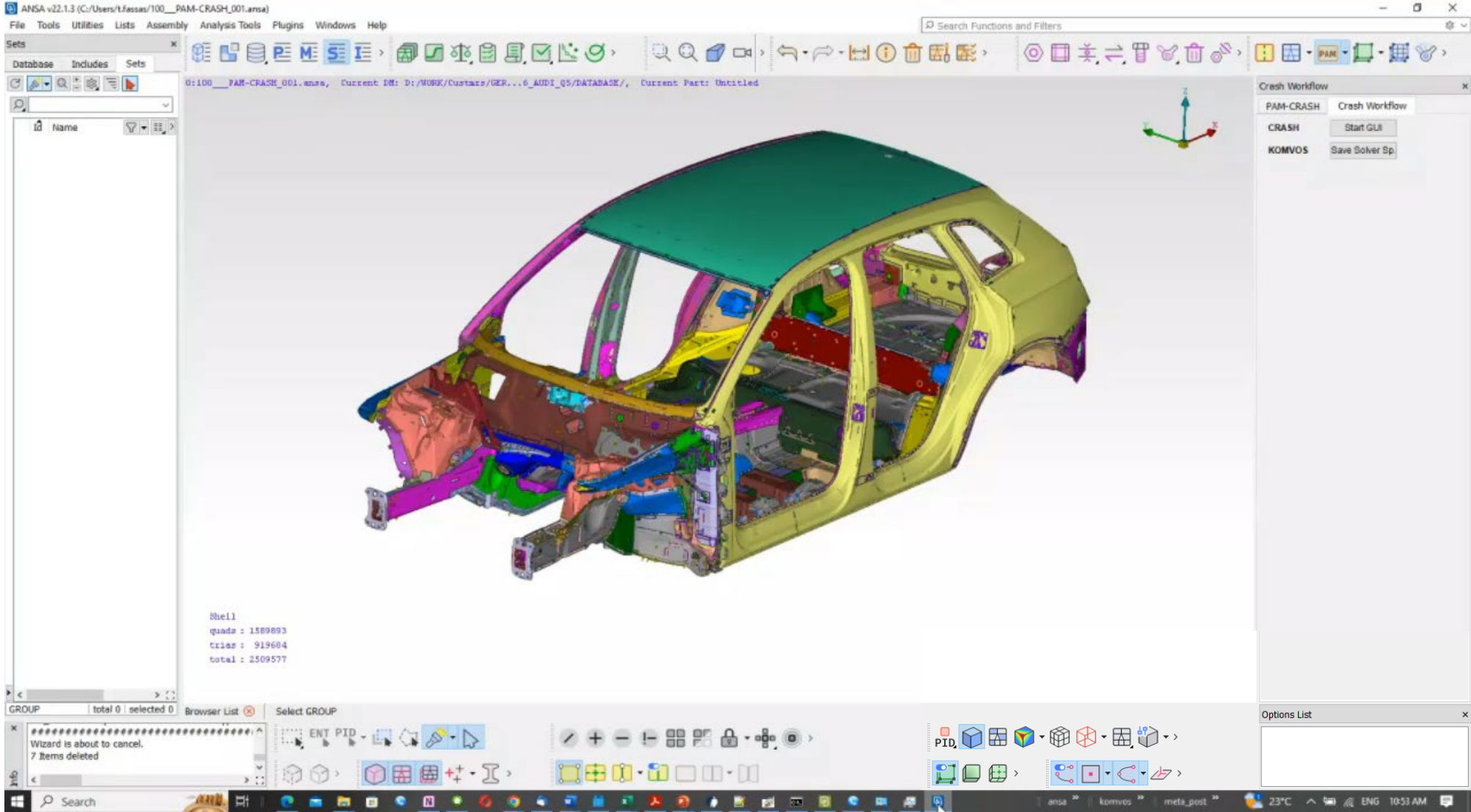
- Solver Representations
- Input/Output Dependency
- Variants

Reference	Selected
FullVehicle	FullVehicle
USA_FW_Long	USA_FW_Long
GXC305	GXC305
RL03	RL03
004	005
-	-
ANSA	ANSA
common	common
26-MAY-2017 13:12:11	26-MAY-2017 13:12:11
16-MAR-2023 11:19:24	16-MAR-2023 11:19:24

Solver Files set up



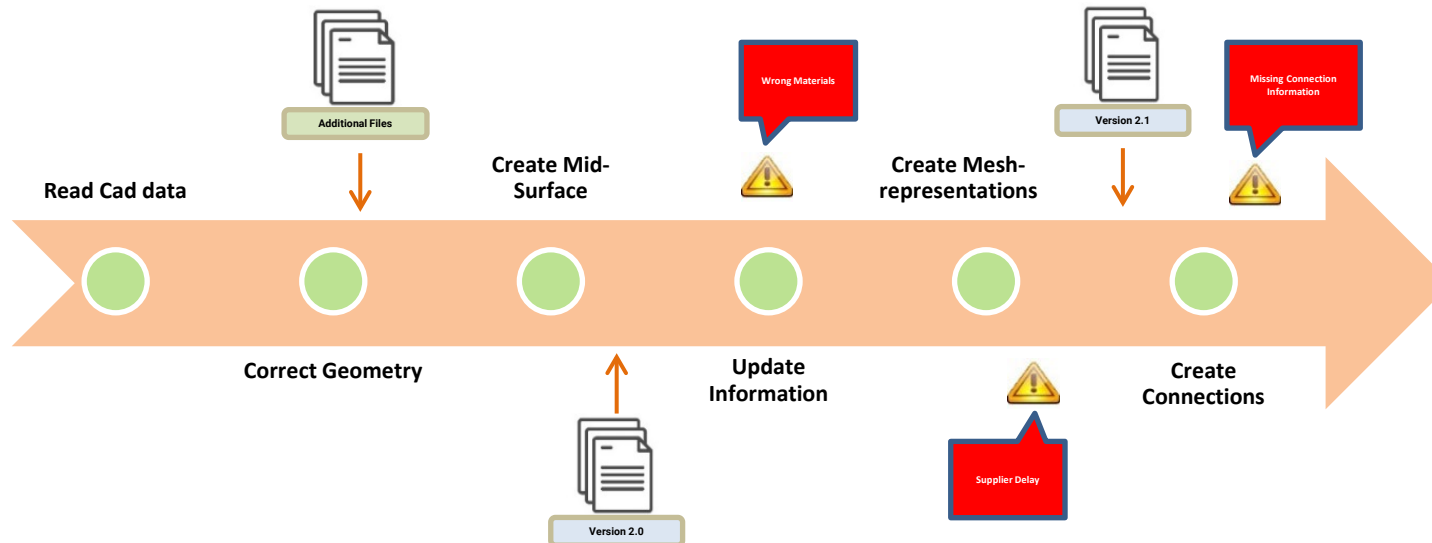
Solver Files set up



Why using KOMVOS

Increase productivity

Not an ideal process



Why using KOMVOS

Simplified process

User independent

Process controls

Needed data

Needed functions

Needed settings and parameters

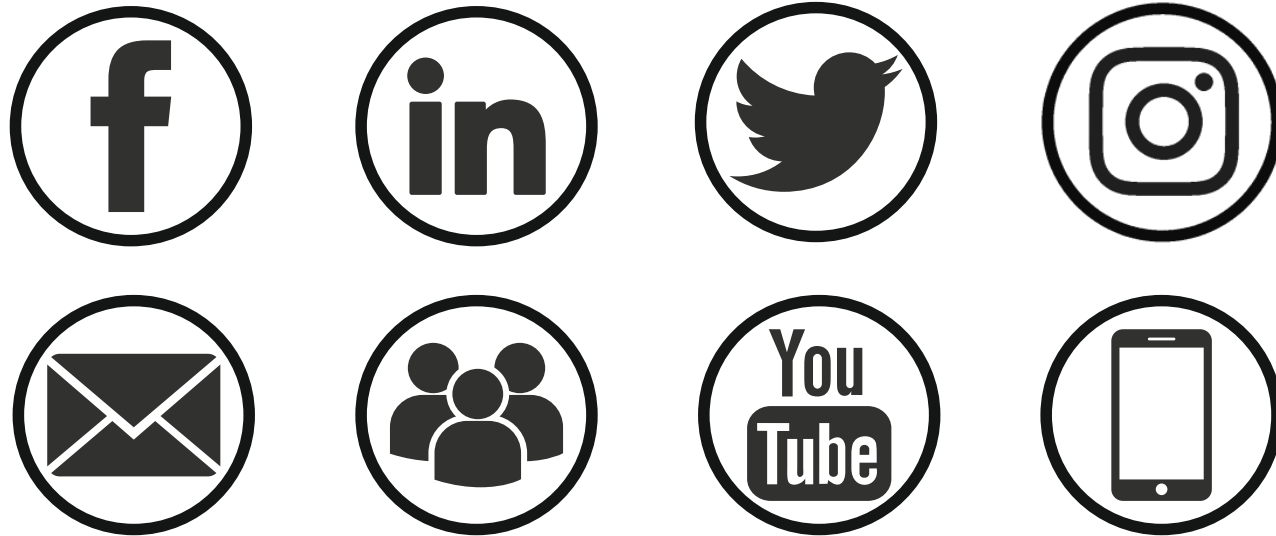
Where to save the result

Why using KOMVOS

Identify errors

Communication with the user

Spread information



Stay connected