

DEVELOPMENT PROCESSES WITH SEAMLESS CAD INTEGRATION IN ANSA AND DCM

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CAD, CAE, Workflow, Meshing, Defeaturing

A fast development processes becomes more and more important for project success, especially in volatile industries as the automotive industry. To meet the time-to-market requirements, the whole development process must be accelerated. This holds also for the simulation tool chain, as a main part of the development process. Beside the pre-processing, the solving and the post-processing, an efficient access to the geometry data (CAD data and metadata) is important, particularly for huge and complex products as full vehicle models for passive safety simulation.

To address this, at BMW the CAD4CAE interface was developed to provide a two-step workflow. In the first step, the user can query the product structure of an entire or a subset of the vehicle. This structure is enriched with meta data for positioning, material, 3d-preview and many more. With this lightweight information at hand, the user can reorganize the whole structure to meet the simulation model requirements. In a second step, complete CAD geometry will be requested for the subsequent pre-processing steps as defeaturing, midsurfacing, meshing and so on.

In the presentation, we will demonstrate the seamless integration of the CAD4CAE interface in ANSA and DCM. We will show, how ANSA and DCM interpret the metadata to support the user decisions. Moreover, we will highlight the generic approach, to address different needs of different simulation disciplines to provide a user-friendly tool to all users.

1. CAD-DATA

At BMW, CAD-data are organized in a PDM-data set, representing the product structure of the vehicle and the CAD-geometry itself. Due to the size, the PDM-data are very handy and can be used for previewing, filtering, and reorganizing the vehicle structure. The heavyweight CAD-geometry will be used only if needed. Typically, these data will be stored in a PDM-system (Figure 1).

The challenge is, to provide a convenient and fast way to access these data.

2. CAD4CAE INTERFACE

The solution at BMW is the so-called CAD4CAE interface providing three different functionalities:

1. Querying the product structure including meta data
2. Querying JT-data for a 3d-preview
3. Querying CAD-data

With this functionality at hand, the engineer can download the product structure of a full or a subset of a vehicle by providing a unique identifier. This PDM-data set contains meta data, including information to download data for 3d preview and full CAD representation.

For testing, a simple user interface of the CAD4CAE interface is provided (Figure 2).

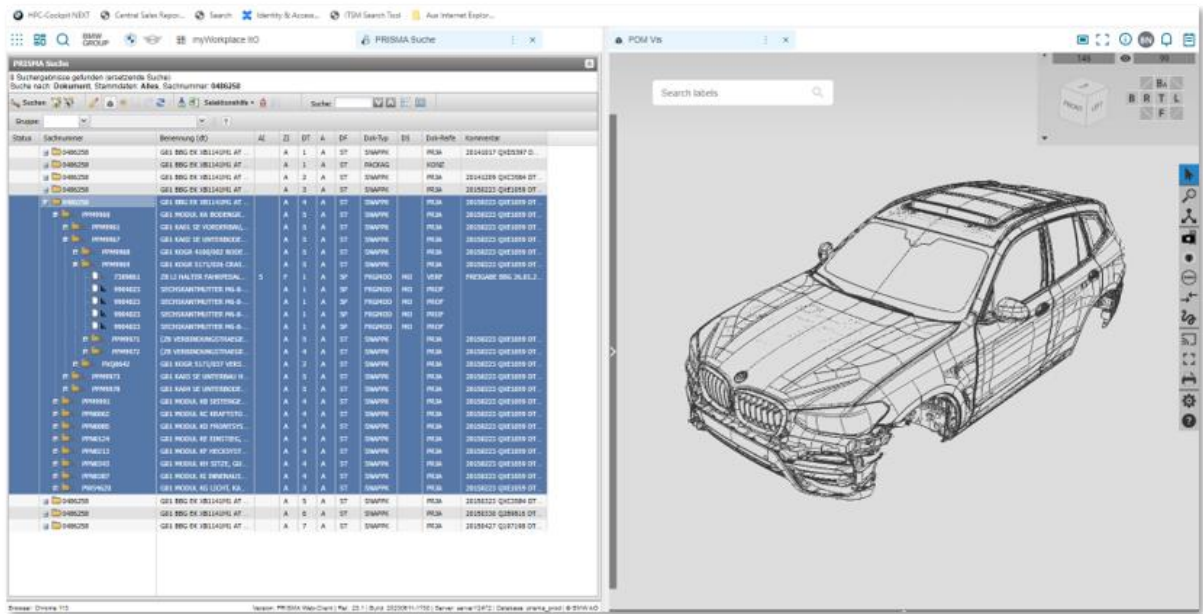


Figure 1 – PDM-structure on the left, CAD-data on the right

PLMXML laden:

TSS-Kennung:

TSS-Passwort:

Verzeichnisname:

OEDE-Name: <SNR>#<Zi>#<DT>#<Alt>#<DokF>#<DokTyp>

Dokuld:

JTFile(s) laden:

TSS-Kennung:

TSS-Passwort:

Verzeichnisname:

JT Unique ID Liste: |jUId1;jUId2

CAD-Daten laden:

TSS-Kennung:

TSS-Passwort:

Verzeichnisname:

Dokuld-Liste: |dokuld1;dokuld2

JT Unique ID Liste: |jUId1;jUId2

Suffix: |cgr

Figure 2 – “User interface” for testing CAD4CAE

3. ANSA INTEGRATION

Utilizing only the CAD4CAE interface does not simplify the daily work of the engineers, since the user has to handle files and extract information out of the XML file representing the product structure.

The key is the integration of this interface in ANSA. With the model browser (Figure 3), the product structure will be displayed as tree view, including all meta data. Out of the model browser, the 3d preview (Figure 3) and the download of the CAD data direct into ANSA can be initiated. Moreover, ANSA considers information about transformation, material, connections, and many more into subsequent pre-processing steps.

9 BEFORE REALITY CONFERENCE

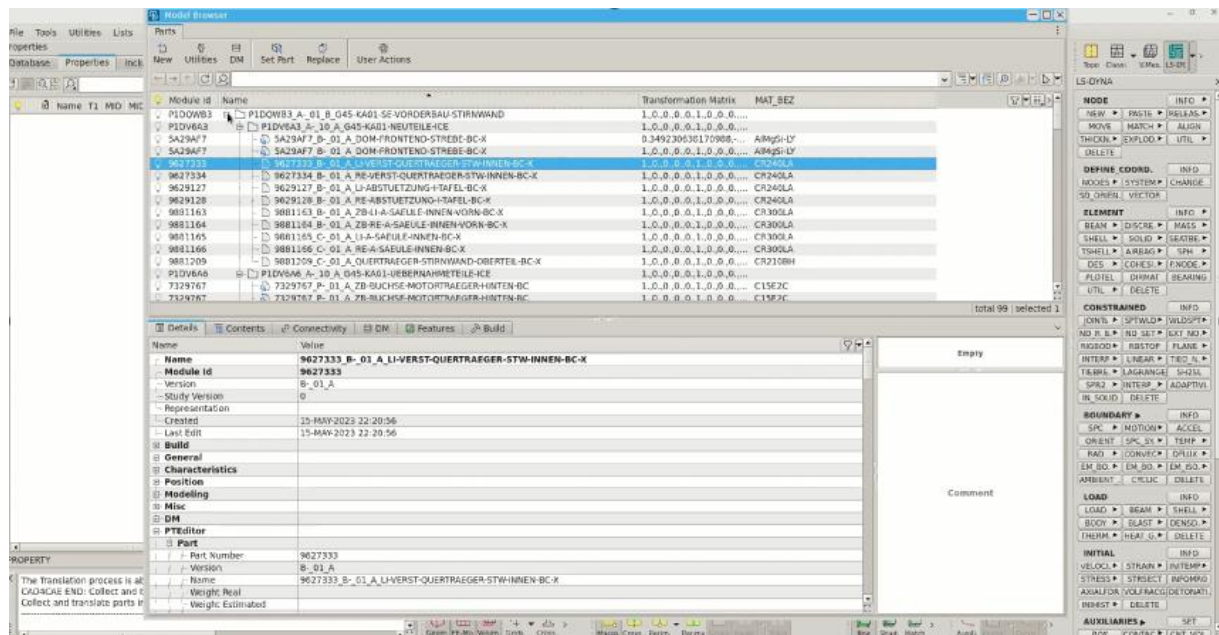


Figure 3 – Model browser for viewing the product structure and meta data

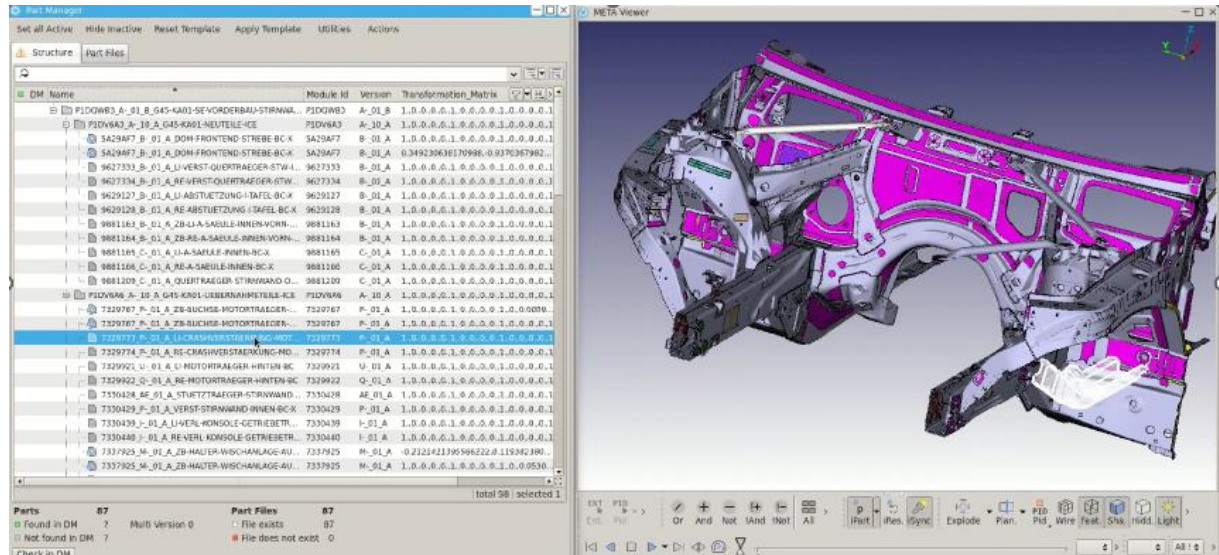


Figure 4 – 3d-Preview

4. SUMMARY

With the CAD4CAE interface and the seamless integration into ANSA at hand, the steps before the pre-processing can be significantly simplified and accelerated.

The way, how the CAD4CAE interface is integrated in ANSA leads to a solution for a convenient access to CAD-data and highly automated pre-processing. This solution is widely used and accepted at BMW. Moreover, the solution is open and extendable, and is used for different simulation disciplines at BMW.