FEM BODY IN WHITE MODELLING PROCESS

Lindner Richard[1], **Fassas Athanasios**[2]
[1]AUDI AG, Ingolstadt, Germany,
[2]BETA CAE Systems S.A., Thessaloniki, Greece

KEYWORDS –

BIW process, Task Manager, ANSA DM

ABSTRACT –

The short development period and the high degree of precision of simulation reports makes it necessary to built FEM BIW models more efficiently and in a short time period.
Since 2007 Audi has been creating the FEM BIW models internally. The reason for this was to decrease the modelling time, create an efficient BIW modelling process and a standardization of this procedure. Audi chose to implement the FEM BIW modelling process with the Pre-Processor ANSA.

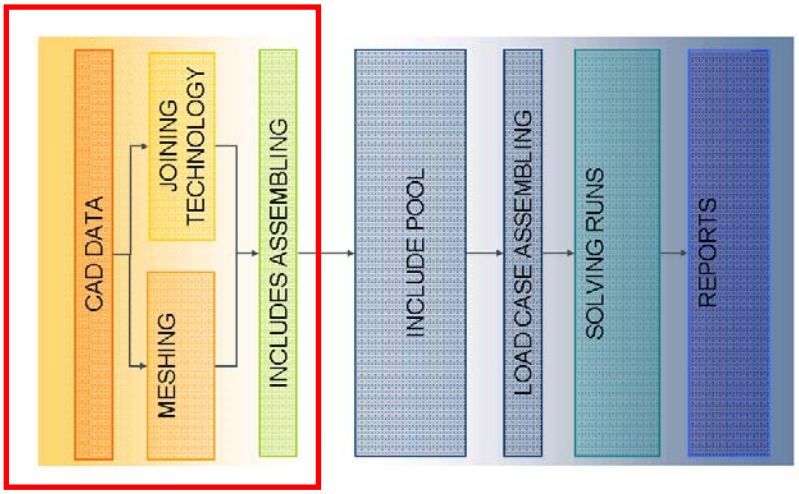
This presentation demonstrates how we have approached this problem and how we plan to deal with the critical stages that appear during this process.

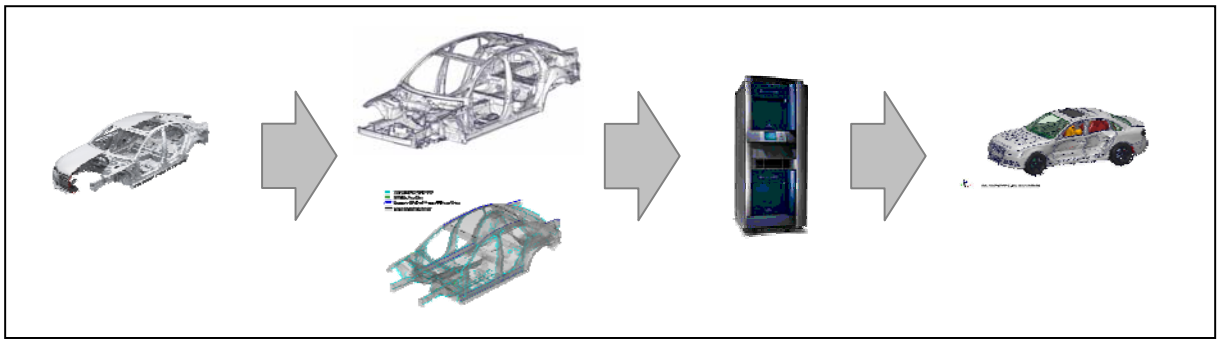
The first section shows step by step the actually status of the FEM BIW modelling process. The process flow starts with the Input of the CAD Department (CAD-Data) and Ends with the Output of an Solver dependent BIW Include (e.g. Nastran).

The second section shows the implementation of this BIW modelling process within the ANSA Task Manager and its interaction with the ANSA Data Management in order to semi-automate the whole process.

TECHNICAL PAPER -

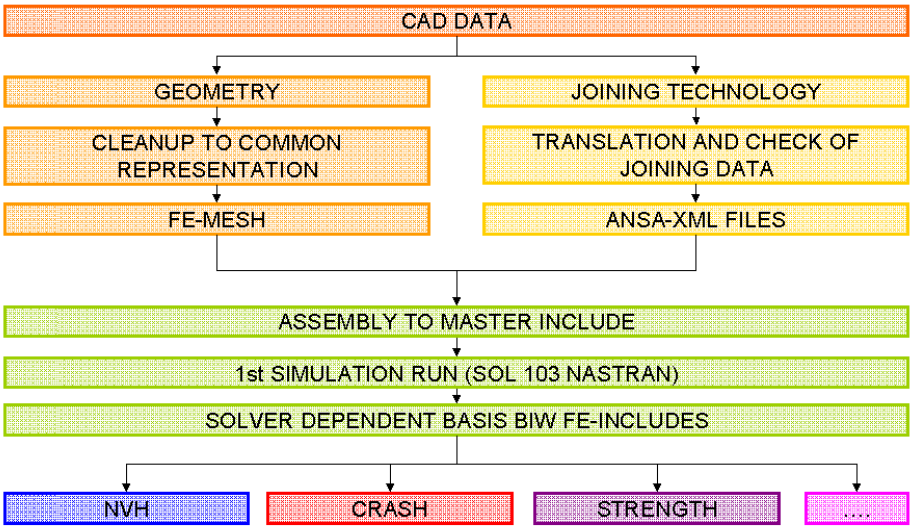
1. SIMULATION SEQUENCE





In this slide we can see the complete Simulation Sequence. The presentation will demonstrate the steps up to the “INCLUDES ASSEMBLING” Section (red marked area).

2. FEM BIW MODELLING PROCESS



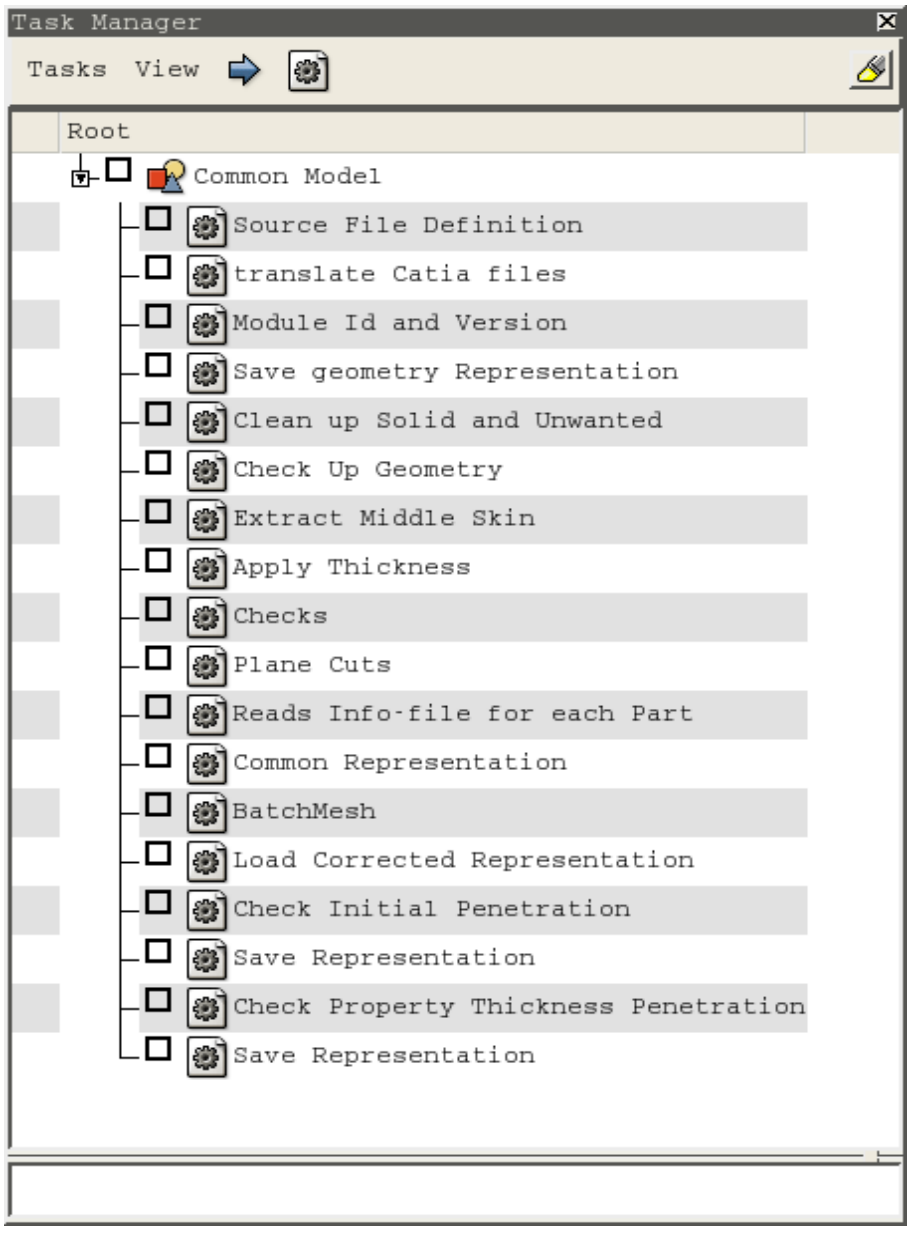
This Figure shows the red marked area from the upper Figure more detailed. For this whole process the software’s used are CATIA V5, Pre-Processor ANSA, Post-Processor META and NASTRAN.

3.TASK DRIVEN PROCESS

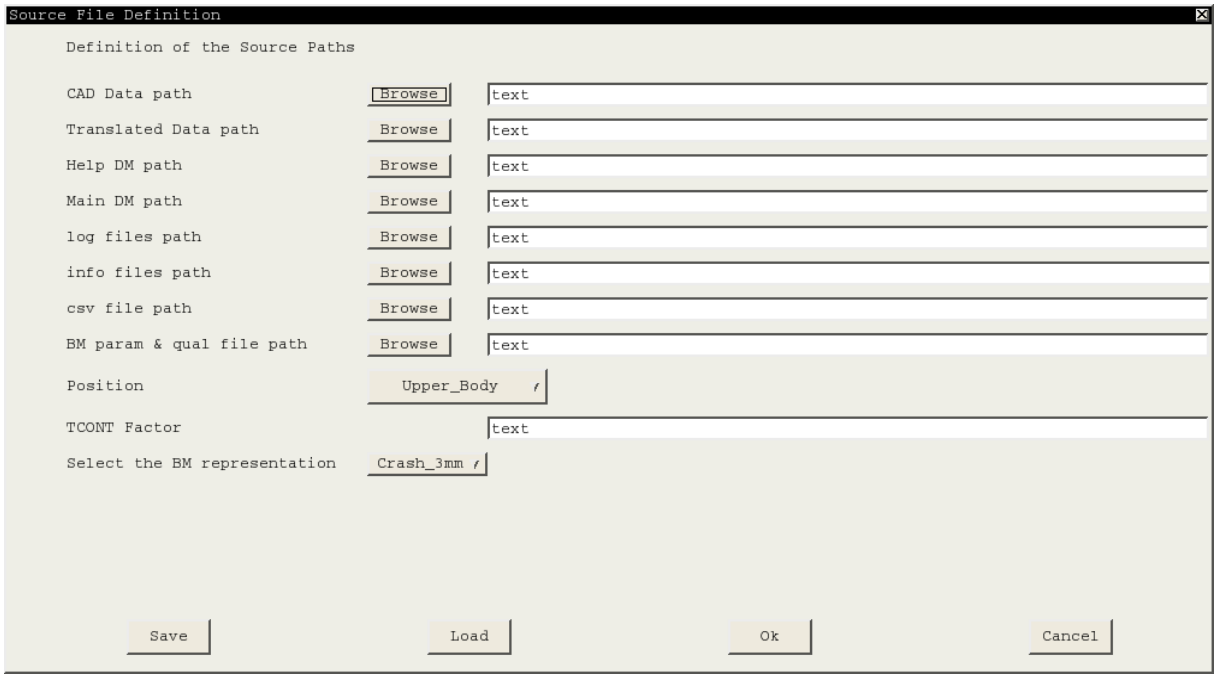
This whole procedure will be implemented in the ANSA TASK Manager. This has the following benefits:

- Automatisation of the whole process
- Easier to control if all steps have been done correctly
- Easier to fit the procedure in more then one projects
- The procedure can be done by several people and lead to the same results.

The TASK cooperates with the DATA Management. It saves useful information in there and can call them back when necessary.
The Steps that have been used in the TASK in order to support the process can be seen in the following picture.



When the TASK begins the user is prompted to select an existing file or to define a new one, in which all the needed paths will be saved for the files that are going to be used and for the files that will be saved during the process.
This file is saved as a System Variable and can be used any time during the process.



In order to keep every stage during the process without deleting the one before, we take advantage of the capabilities of the ANSA Data Management Concept and we save each stage as a unique ANSA Representation. This way we can call back any representation for any Part during the process.

We use ANSA Data Management (ANSA DM) as a centralized data management System, in order to collect and store in a structured and hierarchical form all engineering data that are used during the BIW model process. This way, all engineering data are stored in the same physical location.

The ANSA Task Manager is used by Audi to organize in a hierarchical way all the distinct modelling actions that have to be followed for the BIW model process. It includes all individual steps for this process, considering at the same time the dependencies among related actions.
Each Task, once built for a model can be repeated and used as a template process, to guide the set-up process for similar analyses on other models.

4. CONCLUSIONS

Audi's decision to do this process internally has as a result:

- CAD information can be retrieved of each step within the simulation sequence
- the BIW model creation is actually nearby 80% standardized
- smaller time periods for the development are achieved
- better feedback and information exchange between the departments

Decision to semi-automate the process through the Task Manager and ANSA DM:

- easier execution of the procedure
- fast feedback to CAD-Department about DATA Quality
- all necessary Data are stored at one location
- easier to compare results from different projects
- can be used in all projects (standard)

REFERENCES

(1) ANSA version 13.0.1 User's Guide, BETA CAE Systems S.A., July 2008
(2) Cae_data_and_process_management with ANSA, BETA CAE Systems S.A., July 2008