Paper Title: Requirement Analysis of Simulation Data Management Platform and its Implementation in an Automobile R&D Center

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Key Words
Simulation data management, CAE template

Research and/or Engineering Questions/Objective
CAE methods such as FEM, CFD and MBD have been used in automobile industry widely. Simulation data and CAE knowledge are accumulated, which need to be managed more urgent than before. Simulation process such like boundary conditions, model setup and reporting need to be more standardized. At the same time, CAE methods need to be extended to product planning and concept phase, which can only be possible based on a database. More and More complicated communication process between CAE and CAD engineers needs to be supported by an IT system and CAE knowledge need to be transferred to new staffs more efficiently. Under this background, an IT system is defined and implemented in order to standardize CAE processes, manager CAE data and, for some field, automate CAE activities.

Methodology
The common CAE data and process management requirements were identified and analyzed. A CAE platform has been implemented based on MSC SimManager. CAE activities are standardized and simulation data are managed on this platform by the concept of CAE templates as a standardized CAE task package. CAE template contains the information about CAE operation, result evaluation, classification and documentation. It includes a general description, standard inputs and outputs, data documentation requirements, evaluation criterions, reference models and simulation methods.

Results
Some early experience has shown the value of such a flexible and scalable system. A better communication between design engineers and CAE engineers has been achieved. Simulation data can be trailed, re-used and shared between different CAE groups. The critical parameters can be benchmarked to historical data and compared with testing data in some fields. Besides the original offline CAE and the automation based on CAE software, more complicated CAE automation can also be supported by the platform. The automation of Vehicle body crash simulation and engine intake/exhaust port CFD has been realized on the platform and their efficiency is increased significantly.

Limitations of this study
The linkage between SDM and PDM is not realized at current stage.

What does the paper offer that is new in the field including in comparison to other work by the authors?
A simulation data and process management platform was implemented not only for a specific CAE process automation but also for offline CAE standardization, in which CAE template was used as a key concept.

Conclusions
A SDM platform is necessary in order to manage CAE processes, data and knowledge. CAE template played a key role in SDM Platform implementation. Different kinds of CAE automation can be realized on the platform.