

**CAE Data and Process Management CAE shorter CAE cycles -
A study in Automotive Industry**

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ABSTRACT

Present-day automotive industry represents one of the most competitive environments in the global market and has been the proving ground for state-of-the-art FE modelling and subsequent simulation techniques in almost every aspect of technology related to vehicle development.

The growing complexity of simulation and analyses in the CAE field requires the collection and manipulation of huge amount of diverse data and leads to error-prone procedures that delay crucial decisions. New CAD tools and parametric design help designers to produce large number of component/vehicle variations in shorter time. This, in combination with the increased number of standard and OEM specific loadcases that should be analysed, brings CAE engineers in front of a new challenge: to improve CAE productivity and make CAE fast, flexible and efficient enough – not only to investigate all vehicle alternatives – but also to identify deficiencies in-time and suggest to CAD possible ways of improvement.

Furhtermore, the boost given to computational resources has allowed the use of optimization techniques on realistic product simulation models. Either in the field of structural analysis or aerodynamic behavior, or even at an early concept design, efficient morphing techniques are required for the controllable shape optimization under given constraints.

Thus, it becomes apparent that modern industry requires high-end tools to assist the CAE-analyst in the build-up of an automated, robust and repeatable process workflow that will capture proven practices and techniques used in a wide range of CAE disciplines. ANSA and mETA offer a complete pre- and post- processing environment, continuously up-to-date with latest solver developments that satisfies engineering needs and reduces the CAE-cycle payload.

ANSA, a leading FE pre-processor in the automotive industry, provides a powerful kernel for CAD-data input, defeaturing & batch meshing of parts with predefined meshing rules and quality criteria. ANSA integrates a CAE process workflow manager that promotes knowledge transfer and exploits experience and expertise in the generation of a FE-model. The heart of this system is the Task Manager, a tool where all individual tasks for the generation of a vehicle simulation model are included. Tasks in Task Manager are built by CAE experts who set the order and boundaries between distinct modelling actions and predetermine all parameters that must be respected. Once the task list is completed it can be used by inexperienced users to generate the FE-model for a required analysis. To facilitate the completion of modelling tasks, a data management system called ANSA DM is used to store/retrieve engineering data, synchronize multi-instantiated parts and, by monitoring CAD-data changes, inform CAE analysts for any component updates and streamline related data. Moreover, it offers easy access to library items and promotes concurrent engineering.

META post-processor meets the demands for accurate and comprehensive analysis of models of constantly increasing size through superior graphics performance, various automation capabilities and numerous features.