# MORPHING, OPTIMIZATION AND AUTOMATION STRATEGIES IN ANSA – THE EFFICIENT WAY TO OPTIMIZATION

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ABSTRACT –
We present efficient morphing, optimization and process automation strategies by unitizing ANSA's powerful Pre-processing capabilities, superior FE and Geometry Morphing Tools and insights gained by working on various client processes. With various end user case studies, we demonstrate that these capabilities provide a robust, easy to use, time and cost effective platform for multidisciplinary process automation and design optimization.

Morphing is a process of smoothly transforming topology as well as cross-sectional properties of CAE components. It has become an integral part of the process of structural design optimization in various CAE disciplines. The morphing requirements can vary from simple transformation of design feature to very complex interaction of various design optimization parameters. ANSA provides powerful pre-processing tools along with the superior FE and geometry morphing capabilities. Unique combination of ANSA functionalities and strategies developed using insights gained by working on various client processes provide a robust platform for design optimization applications in various fields. Automation and morphing tools last mile usability has been further extended to provide easy to use and simple to understand techniques. These advanced techniques allow engineers to gain better insight for improving product design. Many of such solutions have been provided for setting up complex optimization model set-ups and are being used by major automotive OEM's.

We present some of the successful end user case studies, which include:

1. Strategies used in Powertrain Optimization.
2. Accommodating stringent parameters involved while optimizing Tailor Welded Blanks.
3. Automatic Volume compensation for Piston Morphing and Optimization
4. Ribs parameterization and use of the discrete library items in the regular model built and optimization process.
5. Robust Volume and layers morphing strategies for Aerodynamic CFD Application.
6. Automated Post processing Of Optimization results.