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Simulation Process & Data Management

The Future of Geometry Interaction with Simulation

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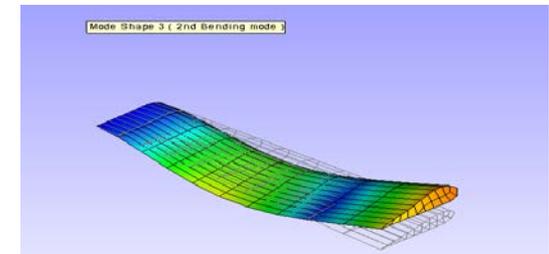
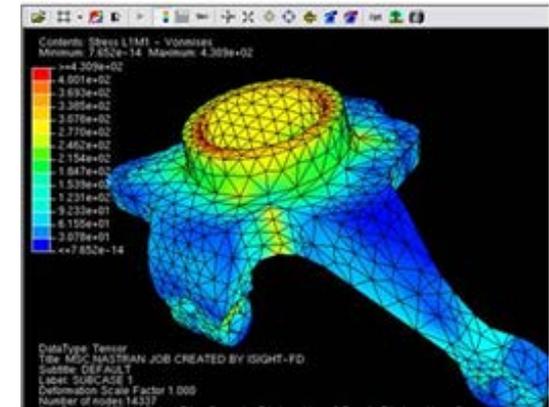
The Future of Geometry Interaction with Simulation

- We have been working on CAD/CAE Integration for over 2 decades – why is this still an issue
- The purpose of the models are fundamentally different
 - CAD models precise geometry
 - CAE models approximated physics



CAE models approximated physics

- Precise geometry is not required for CAE
- Precise connectivity is required for CAE
- Details may make meshing and solution too expensive for the accuracy desired
- Different physics usually require different models





CAE models approximated physics

- CAE models account for solution of physics to a desired accuracy
 - Loads, Boundary Conditions, Materials, Field Propagation
- Typically requires an expert in the loop
- Some limited success with CAD embedded CAE
- Full blown CAD is not suited to many of the model revisions



The Future of Geometry Interaction with Simulation

- The purpose of the models are fundamentally different
- The forms of the models are fundamentally different
- CAD centric models only cover a subset of assemblies and analyses
- Transforming CAD to usable CAE still accounts for 70-80% of the time spent in analysis



Transforming CAD = 70-80% of time

- Means a large opportunity for Vendors
- Multiple software vendors are addressing this issue with “evolutionary” interactive tools for the Analyst
 - Allows analyst to make CAE models effectively
 - May dramatically reduce time for analysts to make models
 - A great step forward
 - ... but we need more



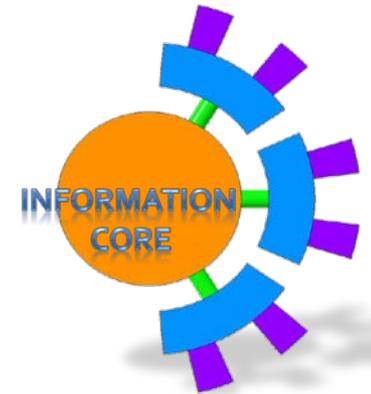
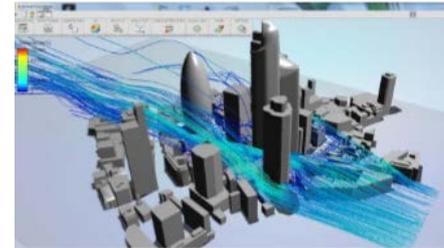
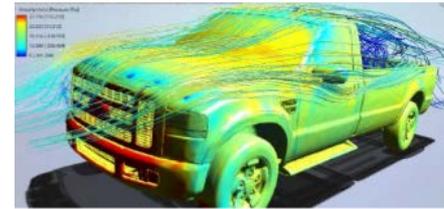
We need More

- The “evolutionary” simulation geometry tools will be very successful from a business perspective and may help buy some time until we will need “revolutionary” tools
 - Dramatically reduce the level of expertise required
 - More automation
 - Allow for capture of recipes and replay on design iterations
 - Allow for knowledge capture & reuse



Enabling the Revolution

- Increased emphasis on “fit for purpose” applications
- Increased emphasis on Systems Engineering
- Unlimited access for the appropriate “performance” evaluation needed
- Emergence of simulation knowledge capture & reuse
- Emergence of near real time / near physics approaches
- Emergence of “meshless” approaches
- More ...



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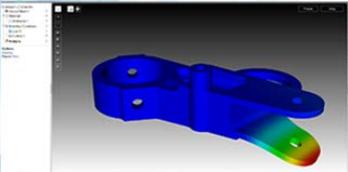
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