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Title:	Advanced Variance Analysis and Make
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Summary:

- Created a system that converts a 3D scan point cloud into a workable format to be analyzed by structural and aerodynamic performance. This system has improved efficiency by replacing a manual process that takes hours to complete with an automated process that takes a few minutes to convert with a successful rate displayed by this project.
- Produced a single thread workflow that automates the performance analysis in order to predict performance results in a lightweight format that can be used on a per part basis (piece part) or in an in depth trend study (batch of parts). This removes the need for additional resources which are typically required to update performance models for each scan.
- Developed a feature based "should-be" costing analysis that can predict the sensitivity of the part's cost based on the manufacturing tolerances. This innovation is paramount to the development of the cost vs. performance analysis. By creating a link between the performance driven by certain features and the cost of the part (previously defined by surfaces) allows for a direct comparison between cost and performance.
- Analyzed the relationships between parts geometry, performance, and cost to enable an optimal design between performance and cost to meet a customer's needs. The ability to use advanced analytics to understand the variations associated with geometry, performance, and cost enables an improvement in products performance/reliability, reduce costs, and improve engineering productivity.
- Automated the process through the digital highway via HPC and DMC capabilities in order to bridge the gap between manufacturing and design by allowing easy access of performance and cost data through hand held devices. By giving easy access to the data produced by this methodology, design and manufacturing will find common ground by having visibility to how the parts are being produced and affects this has on both performance and cost. This will enable further innovations and a better form of communication to develop an optimal product.

This methodology was developed by using one specific application (3rd stage turbine blade), but the framework in place can be applied to a number of other application.