

12. “BREAKING DOWN THE BARRIERS TO SIMULATION - HARNESSING THE CLOUD TO DEMOCRATIZE SIMULATION”

Scott Reese

Autodesk

SUMMARY

To remain competitive, manufacturing companies need to understand everything about how their product designs will perform before those products exist in the real world. Without this critical insight, customers are faced with potential product failures and liabilities that can have a significant impact on their businesses.

It is clear that at different times in the product lifecycle, the needs of the designer, engineer or analyst are very different. The historical answer to this challenge was to try to take an analyst-level solution and to simplify it for use in different situations and by different people – a solution that has never worked and has solidified the perception that simulation requires extensive, specialized knowledge and training in order to use it effectively.

An alternate approach to this problem is to empower designers, engineers, analysts, and others to fully enjoy the benefits of simulation by breaking down the barriers that have historically hindered simulation’s broad adoption. This approach challenges all preconceptions about who can simulate, how often they can simulate, and what they can simulate. The power of simulation is the ability to make a better decision earlier and upfront in the design process.

A further enhancement to this approach to simulation is to provide a comprehensive set of simulation software securely delivered in the cloud rather than as expensive, packaged software. This approach accommodates the expectation of today’s digital media consumers, including design professionals, to be always connected on mobile devices, an environment in which simulation is an always-available, on-demand resource. By taking this approach, the simulation process – formerly available only to companies with significant financial and staff resources to purchase and perform simulations – is now “democratized” by removing barriers to adoption by enabling flexible access to simulation capabilities, powerful computational capacity, multi-tasking workflows, and lower total cost of ownership.

In this presentation, Autodesk Senior Director of Digital Simulation Scott Reese will discuss the evolution of cloud-based simulation applications and examine how cloud-driven distribution breaks down the barriers of adoption of simulation to the benefit of designers at manufacturing firms of all sizes, in all markets. Mr. Reese will describe how cloud computing is especially well suited for large analysis problems and complex design optimization involving dozens iterations, and how use of the cloud enables engineers to upload these problems while continuing to work locally. The speaker will discuss specific cloud-based simulation applications in three key simulation disciplines:

- *Mechanical* - Perkins Specialized Transportation Contracting, a leader in highway transportation services for long, heavy, and oversized objects, recently used simulation software for the custom design of a 400-foot-long truck specifically designed to transport nuclear generators. The cloud-delivered software enabled Perkins to perform motion analysis and check for interferences throughout a full range of motion as the various axles turned and rotated and also allowed the company to optimize its designs, ensuring that the transporter had only the support beams necessary to successfully distribute weight among the various axles.
- *Injection molding* - Articulinx, a medical device company that helps patients afflicted with osteoarthritis improve quality of life by reducing pain and restoring mobility, used simulation software to assess the unique material properties required in creating a new type of implant. The company ran multiple simulation computations in parallel without being bogged down or losing productivity and enabling designers to optimize injection molds to reduce or eliminate design changes.
- *Computational fluid dynamics (CFD)* - Daktronics, one of the world's largest suppliers of electronic scoreboards, digital billboards, and large-screen video displays, used simulation software to make certain that its displays will withstand all types of weather, dissipate heat generated by LED components, and be readable even when facing bright sunlight. The software enabled Daktronics to eliminate the traditional time-consuming CFD process to analyze complex product design factors early in the design process and compare benefits and costs for different combinations of components, fans, heat sinks, enclosures and materials.