

YES! PRODUCT ENGINEERS WITH LIMITED CAE EXPERTISE CAN SAFELY RUN COMPLEX SIMULATION USING SIMULATION APPS.

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KEYWORDS

Simulation Apps, Simulation Process Automation, Abstract Modeling, Simulation Process & Data Management

ABSTRACT

The product engineers and designers at BWAY Corp., a global plastics and metal container manufacturer, have used simulation in their plastics container design process for a few years. However, they could not justify the “cost of ownership” of simulation capabilities – i.e., CAE experts, in-house CAE software licenses, computational hardware and the IT resources to maintain the software and hardware resources. Hence, all of their simulation needs were outsourced to CAE services companies. The outsourcing process, while providing useful data for design decisions, has proven to be slow, inefficient, costly and inadequate for their simulation needs. What they really needed was the ability to perform these complex simulations and what-if trade studies themselves – *safely, robustly, on-demand, economically, and in a timely manner* – without incurring the high CAE “cost of ownership”.

Allowing a non-expert to access complex simulations using today’s general-purpose simulation software is impractical and, especially to experts in the use of this CAE software, even dangerous. This is because most CAE tool experts continue to believe that simulation cannot and should not be performed except by those who have deep expertise in the esoteric and arcane art of extracting reasonable results from today’s general-purpose simulation software. Hence,

unfortunately, simulation has been the exclusive domain of too few (the “simulation experts”) for too long, ever since its inception in the earliest days of computing.

However, in the last few years, a number of manufacturing and research organizations are demonstrating the ingredients of a solution that puts simulation, both simple and complex, *safely and robustly* in the hands of all those that need it, and in particular, those that do not have any expertise in the underlying CAE tools. They are showing that the intricate confluence of simple-to-use, solution-specific web applications that speak the language of the user, called Simulation Apps, automated design space exploration tools, and “lights-out” automation that works across all design changes, bolstered by the “elastic and infinite” computing capabilities now available on The Cloud, facilitate the global and safe deployment of complex simulations to anyone who needs it.

In this presentation, we will show how, by using SimApps developed by Kinetic Vision and Comet Solutions’ Intelligent Templates to automate the simulation process, BWAY product engineers are now safely performing complex top-load container simulations. The templates were created by experts in plastics simulation at Kinetic Vision and validated thoroughly against test data, making them robust, safe to use, and accurate.

The authors believe that the safe use of complex simulation by non-experts *requires* that experts embed their expertise, safeguards and adequate feedback and metrics on the quality of the analysis into the simulation templates. The authors also strongly believe that such templates need to be thoroughly validated before the non-experts can use them robustly. Finally, SimApps that are truly useful must also work robustly across both significant design changes as well as across an entire product family that shares a functional (engineering) architecture. This presentation will demonstrate how the technique of abstract modelling is used to capture simulation expertise/rules in the templates, thereby satisfying this requirement.