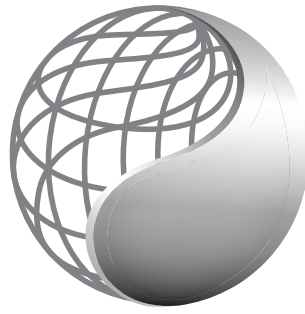


AWE SIM



Virtual Designs. Real Benefits.

Simulation-driven design for small and mid-sized manufacturers.

Manufacturers are under constant economic pressure to deliver high-quality, low-cost products. Many large manufacturers have embraced simulation-driven design to achieve a degree of market advantage. Simulation-driven design replaces physical product prototyping with less expensive computer simulations, reducing the time to market, while improving quality and cutting costs. Smaller manufacturers are largely missing out on this, because they cannot afford to leverage such solutions.

The Ohio Supercomputer Center (OSC) has developed unique capabilities and, together with client partners, a product strategy to help reduce the barriers to entry for a largely untapped market: cloud-based manufacturing simulation applications sold through an e-commerce marketplace.

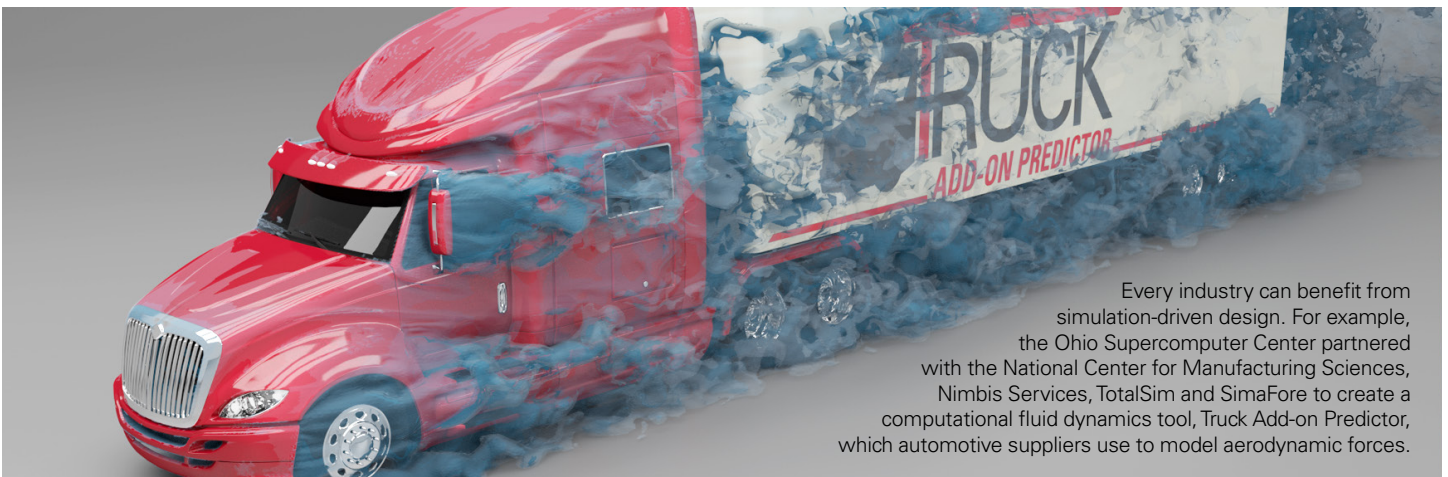
Manufacturing simulation applications (or “apps”) integrate essential manufacturing domain knowledge, sophisticated simulation software and powerful computational resources inside a web-based workflow. For example, by clicking a few buttons, the strength of a virtual weld can be predicted through simulations. Similar prototype manufacturing apps already have been developed for companies in fields such as consumer goods, advanced materials and the automotive industry.

Project funding and partners

The AweSim team has an extensive track record leading to the development of this modeling and simulation platform and a collaborative cost-share commitment of over \$3 million to the program. In June, the State of Ohio invested an additional \$3 million in AweSim through its Third Frontier Commission Innovation Platform Program.

OSC, a member of the Ohio Technology Consortium, has been at the forefront of the national effort to help industry gain easy and affordable access to advanced modeling and simulation technologies, starting with the 2004 launch of its innovative and widely regarded industrial outreach initiative, Blue Collar Computing.

OSC and partners Procter & Gamble, Nimbis, TotalSim, AltaSim and Kinetic Vision have been involved in the National Digital Engineering & Manufacturing Consortium, a pilot program funded by the Department of Commerce's Economic Development Administration. Led by the Council on Competitiveness, the project provided Midwestern small and mid-sized manufacturers with access to advanced modeling and simulation resources. Also, Intel has joined the AweSim team to help coordinate workforce education components.



Every industry can benefit from simulation-driven design. For example, the Ohio Supercomputer Center partnered with the National Center for Manufacturing Sciences, Nimbis Services, TotalSim and SimaFore to create a computational fluid dynamics tool, Truck Add-on Predictor, which automotive suppliers use to model aerodynamic forces.

"It is vital that small and medium-sized businesses have access to the powerful computational and storage resources large businesses use. Those resources can fuel the more precise and accurate models necessary to mimic the actual results of physical tests commonly used to innovate."

—Tom Lange, Director, Modeling & Simulation Corporate R&D, P&G

AweSim value proposition

Simulation-driven design offers a sustainable competitive advantage to manufacturers via a significantly lower cost than alternative technologies, productivity tools and built-up capabilities. Together these differentiate the platform from potential competitors and benefit the value chain of suppliers, OEMs and end users.

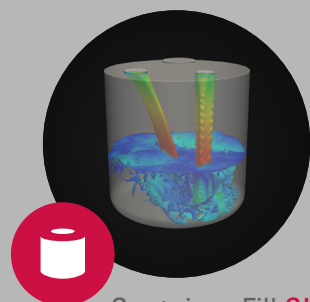
Program objectives

- Create a unified, innovative and commercially ready platform consisting of a web-based App Store, supporting infrastructure and appropriate app development tools.
- Initially populate the App Store with at least six apps of broad marketability, such as a virtual wind tunnel and a crush test, and lay the infrastructure for rapid development and deployment of more future apps.
- Actively pilot and market the developed apps to small and mid-sized manufacturers.
- Create a broad-based training program to equip both novice employees and traditionally trained manufacturing specialists with the enhanced skills.

Anticipated economic outcomes

- Developers creating new manufacturing apps will make them available to end-users through Nimbis' e-commerce App Store, which in turn accesses OSC's HPC infrastructure to run the apps, generating revenue to Nimbis, app developers and OSC.
- App developers are expected to invest a further \$6 million towards the creation of new apps in years 4-6.
- OSC's improved tools (App Kit, App Runtime) will provide engineering service providers, software companies and cloud providers the ability to rapidly and efficiently develop apps for new markets.
- Small and mid-sized manufacturers will benefit from a low-cost, accessible technical capability; this will help ensure their global competitiveness by supporting faster and cheaper manufacture of improved products. The apps are estimated to reduce time to market by 50 percent and decrease product development cost by 30 percent.
- Workers will receive training on these sophisticated new digital tools, ensuring full use of the new capabilities and significantly enhancing their employment opportunities.

Pilot Apps



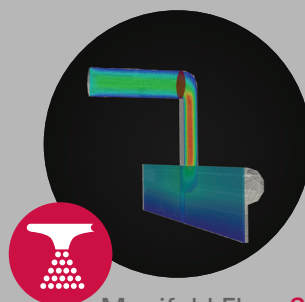
Container Fill SIM

Benefits: Maximizes the manufacturing line speeds



Truck Add-On SIM

Benefits: Pinpoints impacts on fuel efficiency



Manifold Flow SIM

Benefits: Achieves even and consistent output



Fan SIM

Benefits: Optimizes designs to meet requirements

For more information, visit awesim.org or contact:

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