

What is the ASSESS Initiative and why is it important?

ASSESS is a broad reaching multi-industry initiative ...

...to expand significantly the use and business benefit of software tools for performing model-based analysis, simulation, systems engineering, and simulation-driven design in the engineering applications domain.

The changing role of Engineering Simulation is really about business benefits. However, achieving those benefits and associated growth of Engineering Simulation across all industries is tempered due to the lack of available expertise and advanced tools for predicting cross technical simulation interactions. A simulation revolution needs to occur; however, that will bring a whole new set of opportunities and challenges.

“ASSESS provides an opportunity to get a broad-based, non-parochial perspective on the state-of-practice and direction in the Computer-Aided Engineering industry, as well as providing a community in which to share concepts and advance the collective investment in the industry. “

Gene Allen
President & CEO
Decision Incite

- Improving collaboration and synchronization of development and implementation efforts between Government, Commercial, and Research activities, as related to Engineering Simulation.
- Establishing a clear path to understanding by company executives about the relationship between Engineering Simulation and the nature of their strategic business objectives.
- Enabling significant growth in the applicability, usage and business benefit of Engineering Simulation.

ASSESS is complementary with many other industry organizations in that it interacts and collaborates with multiple activities and organizations across the complete spectrum of Engineering Simulation, including NAFEMS, INCOSE, Cambashi, CIMdata, intrinSIM, and others.

Engineering Simulation as defined by NAFEMS is “The use of numerical, physical or logical models of systems and scientific problems in predicting their response to different physical conditions.”

The primary goal of the **ASSESS Initiative** is to facilitate a “Simulation Revolution” that will vastly increase the availability and utility of Engineering Simulation across the full spectrum of industries, applications and users. It is about making Engineering Simulation widely available & appropriate to support improved decision making throughout the entire life-cycle of engineered products and processes. The ASSESS Initiative was formed to bring together key players to guide and influence strategies for developing and using software tools aimed at:

- Creating a collaborative environment for strategic discussions by including all parties involved with computing tools for Engineering Simulation.
- Opening up access to sophisticated tools for those currently denied access due to lack of sufficient expertise.
- Removing limitations of current tools that currently require high levels of expertise.
- Improving significantly the introduction of new technologies and collaborative applications of Engineering Simulation and systems engineering.

Why ASSESS?

The ASSESS Initiative brings together thought leaders in Engineering Simulation from multiple perspectives (software vendors, consumers, government, academic, and industry analysts) to help shape the industry and product strategies for the next decade and beyond. ASSESS offers a wide variety of benefits to consumers of Engineering Simulation related to keeping abreast of and influencing advancements of technologies and best practices.

“Numerical simulation is still done by experts. We need to find a way for more and more engineers to use it in some way to drastically increase overall benefits inside a company like ours.”

Anne-Marie Giroux
Chercheur
Institut de recherche d'Hydro-Québec

ASSESS Themes

The ASSESS Initiative has been organized around a key set of six themes associated with expanding the usage and benefit of Engineering Simulation.

Align – Aligning Commercial, Government and Research efforts

The Engineering Simulation efforts along these three vectors are very poorly aligned with a significant amount of “repeatedly reinventing the wheel.” The focus of this Theme is to highlight and provide options for addressing the issue that the efforts related to advancing Engineering Simulation have three key, but disjointed, vectors (commercial, government, research).

Business – Business Challenges and Opportunities

The changing role of Engineering Simulation is really about business drivers for improved competitiveness: 1. Increase Innovation, 2. Increase Performance, 3. Improve Quality & Risk Management, 4. Reduce Time to Market, 6. Reduce Cost. Engineering Simulation is a major key to all 5 business drivers in providing a better understanding of product and process behavior, variability and risk. The focus of this Theme is to investigate issues and to develop approaches for enabling a transformation of business models that will enable a significant increase in usage and benefit of Engineering Simulation software tools.

“Participating in ASSESS allowed me access to simulation experts in other fields so we were able to discuss similar challenges we were facing and our creative solutions for tackling them. It’s useful for the industry to build a coalition to advance simulation.”

Tina Morrison
Deputy Director

Division of Applied Mechanics
Office of Science and Engineering Laboratories
Center for Devices and Radiological Health
U.S. Food and Drug Administration

Credibility – Engineering Simulation Credibility

The efforts related to this Theme will guide and influence engineering simulation software development and implementation strategies that establish the appropriate trustworthiness of digital simulation predictions for business decision making. This Theme will explore issues associated with engineering simulation credibility for achieving business goals that have a direct impact on product quality, development efficiency, risk, and safety.

DoES – Democratization of Engineering

Simulation

Engineering Simulation needs to be made available and used by a significantly wider audience of product & process developers in a reliable way that does not require them to be experts in specific simulation applications. The focus of this Theme is to advocate for and enable a significant expansion of the use of Engineering Simulation by all potential users in a reliable way, for whom access to the power of Engineering Simulation would be beneficial.

Generative – Generative Design

Generative Design is based on using an algorithm-driven approach whereby the software mathematically computes and recommends the best topologies or shapes of a product. Based on user-specification of information such as the design requirements, constraints, uncertainty and the available design space, the method then explores innumerable possible permutations of a solution to find the best option. The focus of this Theme is to guide and influence the future directions of the broader usage of Generative Design.

Systems – Integration of Systems Modeling and Simulation with Detailed Subsystems Simulations

Systems-level performance evaluations and detailed simulations of subsystems and components are typically separate, unrelated activities. The focus of this Theme is to investigate gaps and to develop approaches for effective integration of systems and detailed subsystems simulations.

ASSESS Enables you...

...to explore/learn why and how to use analysis, simulation, and systems engineering as a strategic asset

- Get exposure to those who are leading the journey.
 - ASSESS brings together key players and thought leaders in Engineering Simulation and provides a unique access to open discussions on challenging topics as it attempts to drive the Simulation Revolution forward. Participating in ASSESS allows you to become one of the elite group responsible for the future of Engineering Simulation.
- Understand expected and emerging breakthroughs in technology before they are released by vendors, including Generative Design, Model-Based System Engineering, and Digital Twins.

- The discussions around the ASSESS Themes provide a unique insight into the requirements and development focus of Engineering Simulation software.
- Understand the roles of Simulation Governance, Simulation Democratization and Model-Based Systems Engineering approaches and application.
- Better understand how product and process performance, behavior and reliability improve competitive positioning - analysis, simulation, and systems engineering are the keys to improved understanding.

... to influence software/hardware vendors to provide the greatest possible value for your organization

- Join others to form a unified voice from multiple companies to multiple software vendors.
 - ASSESS enables a stronger voice to influence software/hardware vendors
- Move the focus from features and functions to intended use and business goals
 - ASSESS advocates moving from a “tool centric” approach for Engineering Simulation to an “application centric” approach.
 - ASSESS fosters the concept that “every simulation should be run to support a decision to be made or a decision that has been made”
 - ASSESS enables focusing on work processes, tool functionality and proficiency needed for tools that user’s do not use on a daily or even a regular basis.
- Support existing and emerging standards for interoperability and integration of multiple vendor solutions

“Understanding and explaining the Engineering Simulation value proposition is not only a challenge for software vendors, but for anyone who needs to convince decision makers to invest in that technology.”

Anne-Marie Giroux
Chercheur
Institut de recherche d’Hydro- Québec

...to express business goals and benefits from your point of view

- Understand how simulation fits into your company’s business objectives.

- ASSESS is focused on the realization that the changing role of Engineering Simulation is really about business benefits.
- Communication of value for Engineering Simulation across your organization, and communication with non-technical executives about the benefit of Engineering Simulation.
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- Implement and maintain a reliable Engineering Simulation EcoSystem
 - ASSESS brings together thought leaders from the model-based systems simulation perspective and detailed simulation perspective.
- Provide quantitative measures and other methods to justify user adoption of software
 - ASSESS is helping move toward the emphasis on “appropriateness” of a model rather than “accuracy.”
- Drive more flexible licensing models to deliver best value to your organization through discussions with end users and vendors.

... to connect to all the ASSESS Initiative activities and information

- Understand the directions of the overall market from the vendor perspectives.
- Exchange experiences/insights with other end-user thought leaders.
- Engage in discussions related to the ASSESS Themes.
- Review ASSESS presentations and Research documents.

ASSESS Initiative Membership Program

The ASSESS Membership program provides the following range of benefits:

- Access to all ASSESS initiative “deliverable documents” at no charge, including:
 - Research Papers as available
 - Survey research
 - Others as appropriate
- Access to ASSESS Theme status and update reports
- Access to previous ASSESS Congress presentations
- Access to ASSESS Members-Only LinkedIn Group
 - Ability to participate in ASSESS related discussions & posts
- ASSESS Members Only newsletter
- \$ 100 discount on the Annual Congress Registration fee

ASSESS Annual Congress

The primary event for the ASSESS Initiative is the annual ASSESS Congress. It brings together key leadership participants including experts, industry analysts, software providers, researchers, simulation users, and others in the community of model-based analysis, simulation and systems engineering. The goal is to review the current status, issues, and next steps of the ASSESS Initiative, and to guide and influence the ASSESS Initiative's efforts related to software development and deployment strategies.

ASSESS 2018

The next event for the ASSESS Initiative is the 3rd Annual ASSESS Congress to be held Oct 28th-30th, 2018 at Chateau Elan Winery & Resort in Braselton, GA. This Congress is being organized by ASSESS Initiative LLC to "enable" both strategies and relationships related to Engineering Simulation. The theme of this Congress is "Launching the Simulation Revolution." Registration for this event is by invitation only, beginning in March 2018, and is limited to 115 attendees.

ASSESS 2017

The 2nd annual ASSESS Congress was held in November 2017 at the Bolger Center in Potomac, MD. This Congress was organized by ASSESS Initiative LLC to help shape the industry and product strategies for the next decade related to Engineering Simulation. The theme of this Congress was "Understanding the Simulation Revolution."

ASSESS 2016

The 1st annual ASSESS Congress organized by Cyon Research and intrinSIM was held in January 2016 at the Bolger Center in Potomac, MD, during the infamous "DC area Snowmageddon." In spite of the severe winter storm, the participants at this Congress constituted a Who's-Who of the simulation software community to review the status, issues, goals and actionable items of the ASSESS Initiative.

ASSESS SUMMIT 2015

The Analysis, Simulation and Systems Engineering Software Summit was a watershed event organized by Cyon Research and intrinSIM and hosted by the Santa Fe Institute on January 8-9, 2015 that kicked off the ASSESS Initiative.

The Exploding Demand for Engineering Simulation is Driven by Business

The demand for software tools for Engineering Simulation is exploding to support the demand for increased competitiveness and to deal with the rapidly growing complexity of products, processes, and systems.

- **Competitiveness:** The 2008-2009 economic event forced firms to focus on competitiveness as a strategic business goal. This has driven increased visibility in the boardroom for systems engineering, simulation and analysis tools as key enablers to increased competitiveness.
- **Complexity:** The increasing role of software as a competitive advantage in traditionally hardware-only products is rapidly expanding the need for "co-evolution" in the design of hardware, software, electronics, and content. This has driven an increased awareness at the boardroom level of the value of moving analysis and simulation to the conceptual stage of the design process.

- **Advances in technologies and materials:** New technologies, including the rapidly advancing area of additive and hybrid manufacturing, and the explosion of materials with unprecedented properties are also driving the need for more advanced analysis and simulation.
- **Better design decisions earlier:** The move to use engineering simulations early in the product design and concept stage, in turn, is driving the demand for software tools that can be used by those who aren't experts in analysis, simulation, or systems engineering.

We are struggling with an inability to meet the rapidly growing demand for a higher reliance on more realistic virtual engineering simulations.

The business drivers to increase innovation, increase performance / effectiveness, improve quality / risk management, reduce time, and reduce costs are forcing a "**simulation revolution**" to overcome the expertise based user requirements which have restricted the expansion of Engineering Simulation applications.

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The ASSESS Initiative was formed to bring together key players to guide and influence strategies to development and usage of Engineering Simulation software.

The primary goal of the **ASSESS Initiative** is to facilitate a “Simulation Revolution” that will vastly increase the availability and utility of Engineering Simulation across the full spectrum of industries, applications and users. This Simulation Revolution is about making Engineering Simulation widely available & appropriate to support improved decision making throughout the entire life-cycle of engineered products and processes.

“It is envisioned that as we embrace the Fourth Industrial Revolution and the advent of cyber-physical systems and the Internet of Everything, competitiveness in the business environment through the use of real-time multi-physical system simulations will become an absolute essential. The ASSESS Initiative provides a means by which a unified vision and roles can be defined collectively by industry experts to enable and guide the Engineering Simulation Revolution that will occur in the coming decades. We must rethink the industry as we know it today with a vision of performing realistic multi-physical engineering simulations at the speed of human thought!”

Rodney Dreisbach
Engineering Simulation Consultant
Sr. Technical Fellow (Retired)
The Boeing Company

ASSESS 

**ANALYSIS, SIMULATION
& SYSTEMS ENGINEERING
SOFTWARE STRATEGIES**