Simulate More Efficiently
with Best Practice Capture & Reuse
Addressing Simulation Challenges

Product manufacturers need to do more in less time as cost constraints and pressures to innovate continue to rise. Getting design concepts to production faster is critical, but the question is how.

Optimizing Engineering Resources

Today, there are many participants involved in product development and validation including suppliers who have become integral to the design and analysis process. Therefore, diffusion of simulation knowledge and best practices throughout key players in engineering is critical.

Moving Simulation Upstream

Additionally, companies are looking for methods to bring simulation earlier in the design process. Design engineers need to better understand design implications earlier, and get reliable results. Suppliers involved in the design process need to better understand and communicate their customers’ validation requirements so they can deliver on time and win more business.

Manufacturers are addressing the aforementioned challenges by:

1. Focusing analysts and experts on high value simulation projects to optimize resource usage
2. Automating repetitive tasks so design validation becomes faster
3. Bringing simulation knowledge upstream at designer level
4. Diffusion of simulation best practices upstream to designers and suppliers

Collaborative Simulation Between Analysts, Designers, Suppliers

MSC SimXpert and SimDesigner provide collaborative desktop environments for analysts, designers and suppliers involved in design and analysis to optimize resource usage and diffuse knowledge amongst them. The combined solution set allows simulation best practices and knowledge to be defined and pushed upstream and downstream in the design process so companies get more efficient use of simulation and empower more users to perform analysis accurately.
Harness the Power of Integrated Simulation Environment

SimXpert is a fully integrated multidiscipline simulation workspace environment for analysts. Multidiscipline workspaces provide a next generation CAE desktop that enables concurrent engineering analysis aligned with multidiscipline views. Integrated with MSC’s advanced multidiscipline (MD) solver technologies, SimXpert provides an efficient end-to-end solution that gives users native CAD access with bi-directional interoperability, pre-processing, solving, post-processing, and report generation capabilities within a single easy-to-use solution.

Simulation capabilities make it the right choice for engineering:

- Complete integrated solution (pre/post/solver) speeds the process of simulation
- Expansive multidiscipline (MD) simulation workspaces including Structural, Thermal, Motion, Explicit, and Crash
- Bi-directional CAD associativity eliminates data translation
- Integrated Assembly Management for plug-and-play assembly analysis

To accelerate the low value-add stages of simulation, SimXpert also enables analysts to capture and automate all aspects of the simulation process. For instance, analysts spend a large amount of time setting up simulation problems which involves importing a model and meshing it, applying loads and boundary conditions, and defining material properties. SimXpert is designed with out-of-the-box features to help analysts automate repetitive tasks so they can get to results faster, thereby condensing design cycles.

Built-in efficiency tools give analysts speed and control:

- Template builder & runner available with every SimXpert Workspace
- Macro record/replay tools to automatically capture steps as you go
- Easy-to-Use graphical interface for authoring simulation templates
Optimize Resources to Focus on High Value Simulation

SimXpert is designed to make individual analysts more efficient so they can focus on high value simulation projects. The built-in macro record/replay tools enable users to automatically capture a range of actions and steps so they can spend less time on repetitive tasks such as importing models, meshing, quality checking, post-processing, and reporting.

In addition to macro record/replay tools, SimXpert provides analysts with a built-in template builder & runner so analysts can efficiently string together a larger scale process for complete end-to-end automation of micro and macro level analyses, and execute a range of simulation best practice templates quickly across engineering teams.

The graphical drag-and-drop interface and extensive library of simulation modeling actions available within the template builder is convenient for both non-programming simulation experts, as well as advanced programmers. Taking advantage of these automation tools enables both individual users and larger teams of engineers to become more efficient in performing simulation.

SimXpert drives efficiency and faster analysis time by enabling engineers to:

- Seamlessly capture steps to ensure repeatability and accuracy
- Edit templates without repeating the simulation to refine best practices
- Automate pre/post-processing
- Create interactive or fully automatic simulation templates for multi-runs
- Enable best practice, easy-to-use templates for designers
Establish Best Practices for Competitive Advantage

Defining and documenting simulation process knowledge is becoming critical in establishing competitive advantage.

The key to successful implementation of virtual test and validation is to establish simulation standards internally for continuous reuse. This will provide the ability to distribute repeatable methods to others in the process or extended enterprise, especially as globalization pressures continue to rise, and more analysis is done off-shore. The goal is to enable a wider range of engineers to be more efficient in performing simulation.

To establish best practices, companies first need to capture the knowledge that exists within their engineering teams or methods experts. Engineering organizations today don’t have time to hire programmers and spend weeks building out scripts. SimXpert helps deliver an automated solution by enabling analysts to author simulation methods and best practices directly within an easy-to-use interface.

SimXpert enables analysts to author simulation standards and best practices so:

- Analysis knowledge can remain in-house even after experts leave
- Standard tests become documented and more accurately used by others
- Captured methods can be better leveraged across experts & non-experts
- Engineers can run more simulation accurately across discipline teams

Diffusion of Simulation Knowledge

Because simulation is often performed globally by expanded teams, and larger numbers of suppliers are intimately involved in the design and analysis process, manufacturers need ways to create simulation workflows that are well defined and repeatable across engineering discipline teams, analysis contractors, and suppliers. It is the actual diffusion of these simulation methods, workflows, and knowledge that drives competitive advantage.

SimXpert delivers a collaborative environment for companies to not only share common data models across workspaces leading to fewer translations and faster results during the simulation process itself, but also a way to establish simulation standards and allow access to those standards through a common graphical user interface that is easily deployed across key stakeholders in the extended enterprise.

Benefits are immediately gained using SimXpert including:

- Rapid deployment of best practices to suppliers and extended engineering teams
- Upstream reuse of simulation best practices for faster design validation
- Collaborative simulation workflow and integration for suppliers
Bringing Simulation Upstream to Designers

Most companies look for effective ways to bring simulation upstream in the design process. Designers benefit from doing more what-if studies so they can understand design implications earlier. However, the problem usually lies in that designers don’t have the CAE experience necessary to correctly model the part for simulation which is key to getting valid results. In addition, designers might not have experience interpreting the results, yet understanding analysis results is key to making a good design. Thus, a simulation template which ensures modeling best practices and designer-friendly analysis reports provides an excellent solution.

SimDesigner enables designers working in CAD to perform repeatable, fully-guided simulation studies much earlier in the design process. Using SimDesigner, designers have direct access to easy-to-use simulation templates authored by expert analysts in SimXpert that improve the ability to perform first pass simulations and identify design flaws earlier.

SimDesigner empowers designers to accurately use simulation earlier in design. Benefits include:

- Ability to execute simulation templates directly from multiple CAD systems
- Simple interface enables designers to accurately use simulation methods
- Faster design analysis turn-around

SimDesigner is the only CAD-embedded solution that ensures designers get reliable analysis results.

Giving designers the ability to accurately perform simulation means:

- Specialists become free to focus on more advanced simulation requirements
- More resources are available to validate design performance, so subsequently more concepts can be checked during design cycles, enabling more optimized designs
- Design engineers can test new concepts earlier in the development cycle enabling more product innovation
- With the same number of resources, more products can be developed concurrently
Integrated Process Automation Delivers Productivity

The combination of SimXpert, SimDesigner, and SimManager further extends automation to enterprise users. As a collaboration platform, SimManager ensures that methods experts, designers, and engineers have real-time, managed access to the most up-to-date best practice templates from their colleagues around the world. The SimManager Process Builder extends CAE automation to complete simulation processes that are comprised of SimXpert templates, job-submission scripts, and even 3rd party applications.

SimManager enables an auditable simulation process providing a complete pedigree of models, results, and methods that provides a foundation for continuous improvement.

Together, SimXpert, SimDesigner, and SimManager enable companies to:

- Bridge the collaboration gap among methods experts, analysts, designers, and suppliers so simulation results become consistent and accurate
- Use templates to capture simulation best practices and reuse them to ensure repeatability throughout the design process
- Streamline CAE processes to shorten product design cycles

Progressive Path to Simulation Excellence

SimXpert, SimDesigner, and SimManager are built on top of MSC’s leading simulation technology foundation to provide collaborative workspace environments that enable simulation methods and processes to be captured as templates and reused upstream and downstream in the design process by designers and suppliers.

From industry-standard solvers to automation of simulation content and process management, SimEnterprise Solutions let you build your simulation success as your requirements grow. MSC solutions can be combined for a complete, end-to-end simulation environment, or deployed separately depending on your company’s needs.

About MSC.Software

As the global leader in enterprise simulation solutions, MSC.Software enables thousands of companies in hundreds of industries to accelerate innovation, raise product quality, increase revenue, and reduce costs of manufactured products.

Leveraging its 40-year legacy in simulation expertise, MSC.Software offers a broad array of simulation solutions that use detailed digital product models to verify every aspect of product performance, make and track critical design decisions, and communicate and coordinate product development.