



**DIGITAL INDUSTRIES SOFTWARE**

# Remove design silos

Take control of multi-disciplinary design.

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# Accelerate design by collaboration

Emerging digital technologies and electrification are on the verge of revolutionizing heavy equipment. Those innovations typically increase complexity, particularly with greater interactions between mechanics, electronics, and software. Finding effective ways to master this during design will be vital to stay in business.

To many manufacturers, this is a huge challenge, as the way their organization grew over time, led them to have many disconnected teams, working in silos. How about you? Are you losing time by doing double work or searching for data? Are you getting stuck in endless iterations because everyone is only busy in their own micro-cosmos?

As complexity will only keep growing, now is the time to counteract. Accelerate design and stay ahead of the competition. Deploy an integrated, multi-disciplinary approach for simultaneous design of mechanics, electronics, and software. Have all stakeholders collaborate in common tools and workflows, on comprehensive multi-disciplinary models and shared data, and according to industry standards.

## Industry trends

### Electrification

This vital instrument to combat climate change intensifies the interaction between mechanical and electrical components, urging the respective design teams to closely collaborate.

### Connected worksites

For IoT-enabled capabilities such as continuous performance optimization and predictive maintenance, teams across the entire PLM process must be tightly connected

### Autonomous operation

Autonomous capabilities will reduce the need for human labor in remote or unsafe areas. Enabling such functionalities touches the work of many teams.

### Market globalization

With a global spread of activities, especially those for design, more vigilance is required for the emergence of silos as the geographical and cultural distance between teams increases

## Key drivers of change

**Environmental concerns.** Our environment and resources are under pressure. Climate change is confronting us with an unprecedented challenge. We all need to act to turn the tide.

**Demographic evolution.** Continuous urbanization drives young people out of rural areas, where labor shortages can become problematic. Companies look across borders to upscale their activities.

**Improved battery technology.** Energy density and the charging speed of batteries has improved tremendously over the past decades. This enables the electrification wave we are witnessing today.

**Emerging digital technologies.** Innovations such as 5G, artificial intelligence (AI), additive manufacturing (AM), internet of things (IoT) and the cloud are revolutionizing products and business models.

**“Companies have long struggled to break down silos and boost cross-functional collaboration—but the challenge is getting more acute.”**

*Source: McKinsey,  
“Making collaboration across functions a reality”*



# Successfully design complex machines

The true face of design complexity is an enormous number of parameters that mutually interact. Your best chance to discover the combination that optimally satisfies your requirements is by considering all of them simultaneously from the start. By doing so, you will avoid ending up with a suboptimal solution or having to make changes late in the process, when they are costly.

## **Create a comprehensive digital twin**

Already during conceptual studies, you must start with multidisciplinary models. Those won't be perfect, but will help you outline the boundaries for all variables. They will be the basis for a comprehensive digital twin, which represents a product in its current state and stays in sync. All further analyses, even those that target re-use during later programs, will use this representation.

## **Share information across disciplines**

Through the digital twin, all teams have access to common data sets. This reduces inconsistencies between disciplines and creates visibility on the impact of all decisions that are being taken, which presents a huge potential for collaboration. By building interactive review models, you can give all stakeholders access to 2D/3D design views and to an immersive product experience.

## **Shift left**

With full-function design reviews, you can avoid siloed optimization and instead make choices while considering the full picture. It also provides an opportunity to catch issues and make decisions earlier in the process. As design progresses, you lose the opportunity to make changes while the cost of implementing them explodes. Depending on the magnitude of the required changes, these changes could even cancel the entire project. A considerable shift left to catching these issues earlier will result in shorter development times and lower cost.



**“Engineering.com found in a survey that 72% of respondents were saying integrated electrical and mechanical design reduces product delivery time. Estimates went up to 25% or more.”**

*Source: Engineering.com*

# Deploy collaborative tools

At Siemens, our goal is to help you deliver innovative equipment faster despite the complexity that comes with it. Working with us and with Siemens Xcelerator portfolio, the comprehensive and integrated portfolio of software, hardware and services that is accessible as a cloud-based SaaS solution, presents several advantages. Our tools will help you remove silos and take control of multi-disciplinary design.

## **Integrate mechanical and electrical design**

With our capabilities for mechanical and electrical co-design, you can overlap model views from one tool into the other, increasing productivity on either side. We enable robust integration between both disciplines at the desired scale and according to your organizational requirements, from simple data sharing in a common environment, to complementing this with powerful change management, to directly connecting both applications.

## **Simulate coupled physics**

On the engineering side of design, we help you create simulation models for multi-disciplinary performance optimization. Those have a common computer-aided design (CAD) basis and couple all the relevant physics specific to the application. By making such tools accessible through CAD and keeping associativity, we vertically integrate product development process steps and thereby stimulate decisions that can be made earlier.

## **Visualize the comprehensive design**

Finally, we offer visualization and digital mock-up capabilities that are accessible throughout the entire product lifecycle. Those can help you detect and resolve issues before they happen. Our tools are fit for various applications, including static and dynamic clearance analysis, interference checks, part motion studies, assembly/disassembly simulation, and to determine whether sufficient accessibility is provided to facilitate maintenance procedures. Thanks to our firm solution integration, you can easily access and manage all the data you need in this context.



## Your benefits

- **Comprehensive.** Includes all solutions for an end-to-end design process
- **Open.** Easy to combine with existing tools
- **Accessible.** Brings the advantages of simulation to a large group of occasional users
- **Flexible.** Can be deployed at scale, in companies of all sizes, on premises or via the cloud.

**“When we ask executives what is the number one innovation killer at their company, one of the first words we always hear, always, is silos!”**

*Source: Harvard Business review,*

*“The First Two Steps Toward Breaking Down Silos in Your Organization”*

**Siemens Digital Industries Software** helps organizations of all sizes digitally transform using software, hardware and services from the Siemens Xcelerator business platform. Siemens' software and the comprehensive digital twin enable companies to optimize their design, engineering and manufacturing processes to turn today's ideas into the sustainable products of the future. From chips to entire systems, from product to process, across all industries, [Siemens Digital Industries Software](#) – Accelerating transformation.

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