



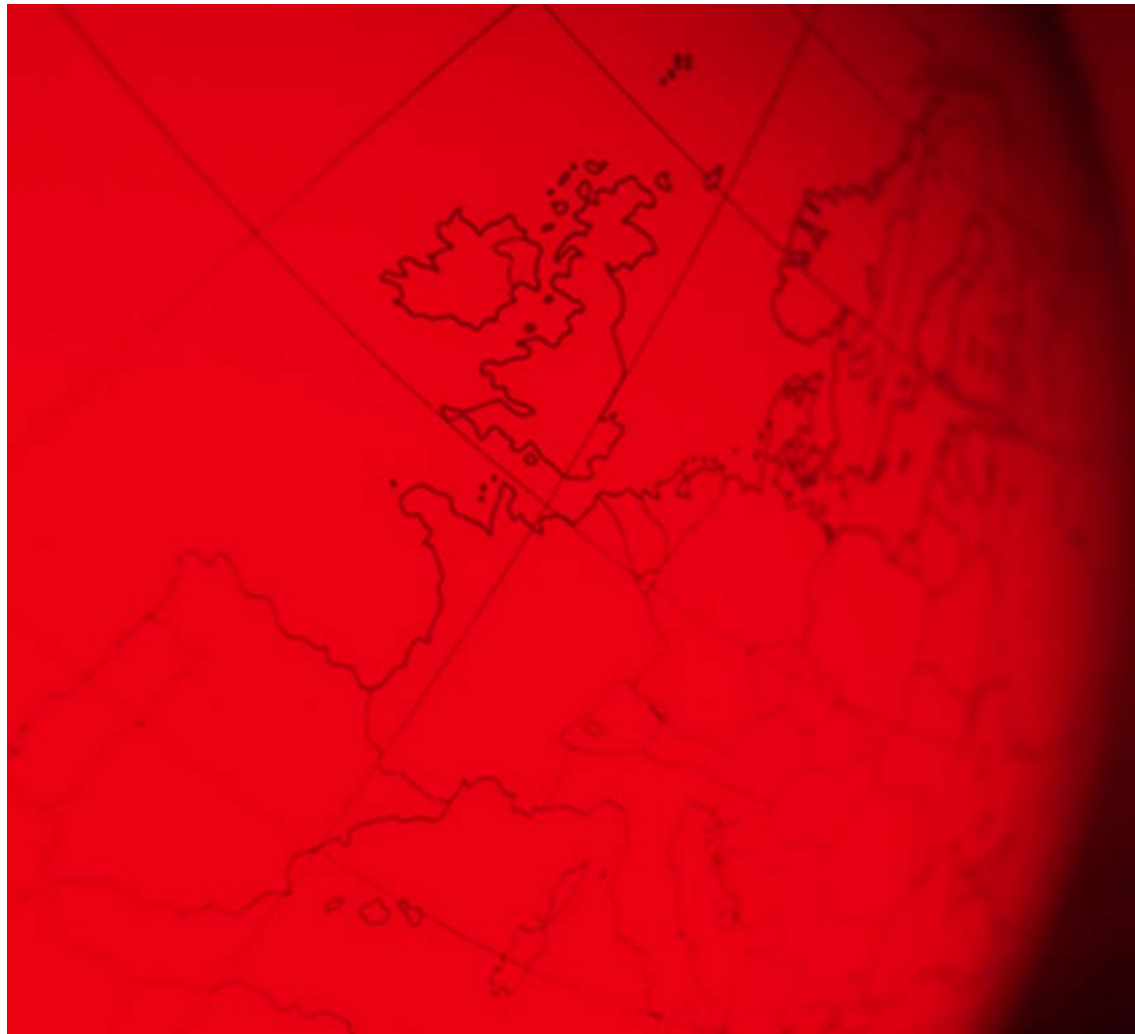
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GUIDEBOOK

SIEMENS PLM FOR MACHINERY AND INDUSTRIAL PRODUCTS



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TOPICS

Enterprise Applications

THE BOTTOM LINE

Siemens product lifecycle management (PLM) software for machinery and industrial products manufacturers enables companies to accelerate time to market and improve innovation while reducing costs.

Siemens product lifecycle management (PLM) software for machinery and industrial product manufacturers includes the Teamcenter platform for community collaboration, manufacturing process management, and product portfolio management.

Teamcenter's mechatronics process management solution provides an environment for the combined development of mechanical, electronic, software, and electrical interconnect technologies in a single library of product and process knowledge. Teamcenter also establishes a common data model across engineering technologies within a common PLM framework. Other key capabilities of the solution include:

- Integration with software development, electronic design automation (EDA), and Multiple MCAD and ECAD tools
- Electronic parts library management and visual design collaboration and assembly analysis
- Links to compliance, supplier, and environment compliance management
- Product configuration management capabilities

Other related Siemens software tools utilized by manufacturers include:

- NX for design and styling requirements, visualization, real-time and photorealistic rendering, and digital simulation
- Solid Edge for feature-based 2D 3D CAD drawings
- Tecnomatix digital manufacturing solutions to support integrated process layout and design, process simulation and validation, and manufacturing execution.
- PLM components such as JT Open enable developers and manufacturers to share design information with collaborators across multiple design platforms.

THE SITUATION

Globalization of both partners and customers present significant challenges and opportunities for machinery and industrial product manufacturers:

- Increasing competition from lower-cost providers requires companies to compete on innovation, not just price, and partner closely with distant suppliers.
- Manufacturers must think through the entire product lifecycle from ideation to end of life to ensure they can comply with governmental regulations such as Tier 4, and the WEEE and RoHS Directives.
- Manufacturers need to be able to simulate designs to optimize resources and processes before manufacturing starts.
- Perhaps most importantly, companies also need to be able to quickly adapt to price pressure with innovative products that meet customer demands while managing and communicating time-to-market expectations.

Siemens PLM software for machinery and industrial products provides machinery and industrial product manufacturers with an integrated end-to-end solution to manage the design, development, and manufacturing process of complex products. Siemens PLM supports both general assembly manufacturing and modular machine design approaches. Digital product platforms are designed to promote the reuse of proven components and processes in future products.

Key returns organizations in the machinery and industrial products sectors achieve from Siemens software include:

- Increased productivity
- Reduced operational costs
- Reduced cost of good sold
- Increased revenues
- Reduced supply chain communication costs
- Faster cycle times
- Increased innovation

This Guidebook explores best practices, fine-tuning tips, and missteps to avoid for companies to maximize returns from their investment in Siemens PLM software in the machinery and industrial products industries.

BEST PRACTICES

Companies deploying Siemens PLM software maximize return on their investment by leveraging the technology's ability to support complex product lifecycles as well as to quickly evolve to meet demands in the industry.

Leverage a centralized knowledge base

Designers and engineers often work in isolated digital environments that include multiple CAD applications for mechanical design, software design systems, electronic and electrical design systems, and versions and multiple document authoring and management systems. This can slow product development and introduce costly errors into the design process, as version control can easily become an issue.

Siemens Teamcenter provides a single searchable environment for sharing and managing information, and the Siemens JT format enables designers across the supply chain to share and view information regardless of the initial authoring application or environment. This enables manufacturers and their global partners to quickly view and compare component designs from multiple locations and applications to reduce rework and accelerate time to market. It can also serve as a centralized library for parts and components that can be reused in future design projects.

Teamcenter can also support broader collaboration between design, development, and manufacturing teams, reducing the cost of changes after product release.

Balance strategic vision and manageable phases

Effective PLM is a journey with many steps, and most organizations find a phased approach reduces risk and maximizes ROI. However, care must be taken at the

onset of a project to ensure the end result is accomplished with the least disruption and cost possible.

Although strategic vision is important, most important is identifying where PLM efforts should first be focused. Identifying key areas of potential return in productivity and cost reduction and prioritizing them in terms of breadth (how many projects or processes will be impacted) and repeatability (how often the technology will be used) can help PLM project managers to plan a project roadmap that limits initial project scope and helps ongoing PLM efforts be self-funding.

Bill of materials (BOM) management, for example, is one area where manufacturers can likely leverage Siemens technology to reduce manufacturing cost and increase design and development efficiency. Teamcenter has as-built management capabilities to manage the physical build record of products to allow visual comparison with build-to-design. It also supports BOM management to help subcontracting manufacturers manage their BOMs and reduce BOM fragmentation on a global basis.

Nucleus recommends PLM project teams first take time to fully learn the capabilities of the software before they begin mapping processes or planning customizations, as greater product knowledge often means fewer customizations — and fewer pieces of custom code that must be supported or rewritten at upgrade time. Training should be a phased effort as well, with initial training on business process changes and use of the application long before the go-live date so early user feedback can be incorporated into future development phases and training materials.

Organizations should also consider their ultimate reporting and integration strategy during the initial deployment phases. For example, if the ultimate goal is to run business intelligence on PLM data for analysis, the data should initially be configured with a view to how it will feed into the business intelligence application.

Have a management engagement strategy

The most common best practice PLM teams cite is strong executive sponsorship. The question is how to make it effective. Beyond selecting an executive that will sign off on the project, the team will need a manager that can actively participate in mapping business processes, making change management decisions, and promoting and communicating those decisions to users. Executives should take an active role in training as well, ensuring that employees fully adopt the new system — even if that means getting HR involved, as one user said.

Train early and often

Although technical and functional training is important, training to promote the use of the system and encourage feedback from users during the pilot phases will drive greater adoption. Depending on the amount of application knowledge of a user base, companies should plan to invest at least two to three days per user for initial training as well as training on how to access support for the application — and make on-demand training available on an as-needed basis.

Distributed teams face special communication challenges. Although a technology platform can support those challenges, it can only do so if users both understand how to use the platform and are motivated to use it to benefit from it.

Particularly in an environment where mature knowledgeable workers are being asked to share their intellectual property, adoption of a collaborative environment can be a challenge. Additional training efforts that go beyond functionality to show users the benefits of adoption to their personal work goals and positions, identify and promote subject matter experts, and market team and individual successes can help drive broader adoption across the supply chain.

Promote early successes

Any technology project that changes the way people work requires change management and lots of communication of early successes to keep users on track. Identifying areas where PLM saves significant time over old processes and promoting those savings in terms of real numbers, encouraging users to submit their own tips and successes in using the system to be more productive, and encouraging open communication and clear support channels can all drive more effective adoption.

FINE TUNING TIPS

PLM is never finished. In fact, companies often find new opportunities to apply their PLM technology and knowledge after the initial project, either by integrating it with other applications, extending it to partners, or both. Nucleus has identified a number of fine tuning tips that can help maximize returns from PLM in the long run.

Add or extend project management

The project management capabilities within Teamcenter can enable manufacturers to improve or manage time to market, and can also enable them to share PLM information beyond its typical audience. When manufacturing timelines or timeline shifts are clear to the rest of the organization, marketing, packaging, distribution, and sales can adjust their related activities accordingly to minimize cost and rework.

Drive broader partner adoption

Particularly in an industry where cost pressures are prevalent, large manufacturers of machinery and industrial products need to be able to quickly allocate resources and bring on new partners in a cost-effective way. Teamcenter and the JT format can enable small and large partners to communicate and collaborate securely across the globe without concerns about intellectual property risk exposure. Large organizations that embrace the virtual design and development environment to leverage smaller, less costly, or more agile suppliers can increase margins and be more competitive on both innovation and price.

Integrate PLM with other applications

Once PLM has been implemented, often greater returns can be achieved by integrating it with other back or front office applications to provide more users with visibility into data, reduce manual data reentry or paper processes, and increase operational efficiencies.

One manufacturer, for example, integrated Teamcenter with its ERP and CRM systems, making Teamcenter the central source for company data from sales and marketing to design, development, and support. This ensured a common version of the truth that could be leveraged throughout the product lifecycle to increase the productivity of users that no longer had to search multiple systems to verify information.

Identify and execute on opportunities for process improvements

The entire PLM process begins with mapping existing processes, and many manufacturers find initial opportunities at that point for operational and process improvements. However, as PLM delivers greater visibility across all phases of the product lifecycle, integrating feedback to drive even greater incremental improvements delivers more innovation and, ultimately, profits. Encouraging feedback and dialogue on ongoing process improvements should include both internal staff and partners.

MISSTEPS TO AVOID

Managing a PLM project takes significant time and investment, and also requires a team that can clearly communicate the tactical details while staying focused on the end game. Nucleus has identified some common missteps to avoid when managing your PLM project.

Don't boil the ocean

When large software initiatives fail, they often do so because they focus on a broad strategic plan, such as end-to-end PLM, but fail to break the project down into manageable steps. Taking time before your project starts to learn the software's capabilities, get guidance from those who have done it before, and map out your project plan with clear phases and timelines will both limit scope creep and allow you to communicate to users exactly what to expect and when.

Don't go it alone

Successful PLM requires both a strong internal team and external guidance and support. Machinery and industrial products firms can look to both Siemens's extensive research and development and expertise in PLM solutions and to the experience of their peers for ideas and adoption strategies — and keep in mind that while the products and terminology may be different, there can be valuable lessons learned from PLM deployments in other sectors.

Don't overlook human factors

Identifying and addressing barriers to adoption are keys to the success of any application deployment. When a PLM project will drive process changes and greater collaboration across distributed teams, individual, management, and structural changes will need to be addressed. Companies should build a number of efforts into their project plan to drive adoption including:

- Ensuring the IT lead has excellent project management and communication skills.
- Designating one high-level executive as the project champion and letting them pick their team of mid-level managers to drive the project. Give mid-level

managers opportunities for visibility and leadership so they can “own” the project, both inside and outside the organization.

- Encouraging pilot users to be whistle-blowers as much as champions. If managers encourage negative feedback in the early stages, it can be addressed before a broad population accesses the application. This in turn will drive fewer adoption challenges.
- Bringing global teams together to meet in person to overcome collaboration barriers, particularly if those teams haven’t worked together before or work for different partner organizations.

Don’t assume one-time training will be sufficient

Any time the system is upgraded or new functionality is added, additional training will be needed, and it’s likely more casual users will need training and support on an ongoing basis. Providing on-demand training, users’ guides, and expert application subject matter experts who can help other users are all good strategies to ensure effective use of PLM. In-application training and quick aids are helpful as well.

Key Teamcenter components to support virtual training include virtual teaming, virtual conferencing, and virtual work instructions that provide full support for training.

CONCLUSION

Machinery and industrial products manufacturers must master multiple challenges that are often at cross purposes: they must drive innovation and faster time to market while optimizing resources in the face of globalization, manage compliance with multiple regulations and regulatory bodies, and deliver products that customers will buy at the right price point. Siemens PLM software unifies both the product and production lifecycle so manufacturers can share product and process knowledge and simulate every step of the design and development process. Deployed properly, Siemens PLM software can help manufacturers to promote reuse to reduce costs, increase productivity, and deliver greater innovation.