

**Siemens PLM Software** 

## Heavy equipment

Siemens PLM Software helps heavy equipment machinery manufacturers realize innovation

## Industry trends and challenges



With a rapidly changing global economic climate, capital-intensive manufacturers face an immediate challenge that is compounded by increasing competition. These manufacturers are pushed to provide more capabilities at the same time they are being asked to reduce their costs. In addition, there is a global drive to facilitate a more sustainable society by reducing pollutant emissions and providing long-term energy efficiencies and related cost savings. This leads to a number of questions: How do you ensure profitable growth in a globally competitive environment? How do you improve operational performance and reliability while meeting escalating requirements for greater productivity? How do you meet the demand for higher constant product throughput, more capacity, better quality and lower lifecycle costs? How do you build a trusted relationship with your end users and dealer networks?



And if those questions weren't enough, your company faces an increasing number of new requirements, such as emissions regulations, which your new products will need to meet and that may need to be integrated into your current machines.

Macroeconomic trends such as the rapid rise in global population (projected at 9 billion by 2050), increased demand for food (agricultural output must double to meet population growth) and rapid urbanization in areas of the world such as China, Brazil and India all point to the need to produce more heavy equipment. These factors combine to require heavy equipment machinery manufacturers to continuously innovate and optimize the products that they manufacture and sell. Today's heavy equipment manufacturers are working in a new product development process that is highly complex; a process that requires them to deliver products faster and with more confidence; a process comprised of hundreds of decision points and parallel work flows that take place in a global context.

To manage this process, heavy equipment manufacturers require a software-driven platform that can support this level of complexity. Siemens PLM Software addresses this reality by providing a product lifecycle management (PLM) platform that helps companies like yours flourish in today's complex business environment.

### Mastering complexity





#### Globalization

In developed countries, aging infrastructure is sorely in need of replacement, upgrade or repair. In emerging markets, demand is even greater for new infrastructure development as countries seek to compete in an increasingly globalized marketplace. Heavy equipment machinery manufacturers have responded by following their customer base to these new markets by forming new partnerships for global sales and service to support these clients or by setting up their own product design and development centers.

To drive these globalization strategies, manufacturers have adopted configure-to-order (CTO), engineer-to-order (ETO) and design-anywhere-manufacture-anywhere (DAMA) initiatives.

#### Optimization

New product innovation involves multiple work processes that require the participation of many disciplines working across organizational boundaries and collaborating with outside vendors to address the needs of targeted global markets. This can be achieved by implementing much smarter CTO and ETO processes and more solid DAMA initiatives. Accurate market alignment and on-time product delivery depend on total visibility into the status of your initiatives, change impact and the identification of potential bottlenecks before they result in irreparable delays. Optimization of the plan-to-production process is essential for managing innovation complexity and ensuring accurate product development and manufacturing process cost management.



# <image>

#### Speed

Technology innovation, customer demand for new technologies and increasing regulation motivate heavy equipment machinery manufacturers to add new capabilities to their machines at a very rapid pace. In addition, the demand to provide these machines in reduced timeframes requires you to deliver your machines precisely on time with no margin for error. Compressed cycle times and time-to-market demands compound complexity, increasing your need to properly support and service your machines as well as ensure maximum uptime.

#### **Sustainability**

Determining how to make your products more energy and emissions efficient adds another level of complexity. More than 90 percent of the cost of the heavy equipment lifecycle comes from running today's machines. With increasingly volatile energy costs, manufacturers that adopt energy-efficient innovations will be able to establish a significant competitive advantage. So will companies that reduce the emissions and waste that their equipment and machinery produce. Best practices for recycling machine components and parts will also pay significant dividends, as will process and machinery improvements that ensure worker safety (such as sensors and controls that minimize accidents and other malfunctions).

## Benefits for heavy equipment machinery manufacturers



#### Accelerate launch

You can reduce the number of prototypes and improve speed to delivery by using well defined requirements to minimize the number of changes during the development process.

A local manufacturer of heavy equipment machines in China, facing fierce competition from foreign companies, leveraged Siemens PLM Software technology to reduce research and development (R&D) cycle time by 30 percent, improve reliability by 30 percent and reduce fatigue life failures by 90 percent.

#### Increase profitable growth

You can create high margins for your heavy equipment machines by accelerating launch and establishing higher price points, as well by reducing prototyping costs and facilitating concurrent global engineering and manufacturing (which also minimizes cost).

A British engineering company, whose heritage dates back to the turn of the twentieth century, applies PLM in the processes it uses to manufacture refuse collection trucks. The company reduced labor content of its production process by 30 to 40 percent and cut manufacturing costs by 30 to 40 percent. It also increased its United Kingdom market share from 35 to 55 percent while raising its operating profit by £1 million per year.

#### **Extend lifecycle returns**

You can leverage PLM to implement a more innovative design process and improve operational performance while meeting escalating customer requirements of greater productivity and lower lifecycle costs. One of the world's leading producers of intelligent power shovels leveraged our PLM solutions to shorten lead times so that it could handle more design iterations, as well as increase product quality and facilitate higher levels of innovation across its overall product development process.

#### **Re-use best practices**

You can leverage PLM's knowledge capture and re-use capabilities to maximize the business value of your information assets.

A leading manufacturer of coal mining machinery faced increasing competition and customer demand for shorter delivery cycles. By leveraging their knowledge capture and re-use capabilities, the company reduced development time by 32 percent and delivery cycle time by 35 percent while increasing market share by 9 percent.

#### **Reduce design costs**

You can reduce product development costs by minimizing physical prototyping and simulating machine behavior and performance during product development.

The manufacturer of the world's largest hydraulic excavators executes its vehicle launches with no physical prototypes, which facilitates enormous cost savings since each physical prototype costs approximately \$1 million. Instead, the company uses our extensive simulation capabilities to test every supporting piece of equipment, as well as the superstructure and undercarriage.

# Solutions for heavy equipment machinery

#### **Global engineering and manufacturing**

Strong global demand for infrastructure repair and build has bolstered the demand for heavy equipment machinery, while increasing the need to leverage global resources. To effectively respond to this significant challenge and opportunity, you need to establish a global engineering and manufacturing platform that can enable your enterprise to design modular machines and support multiple machine variants.

In many cases, these platforms and variants are being developed by global design and engineering teams and manufactured at multiple locations around the world. To facilitate this global reality, you need to track project schedules, resource allocations, customer specifications and all product/ process knowledge generated across your distributed value chain.

Increasingly, heavy equipment manufacturers and their suppliers are turning to PLM as a key enabling strategy that facilitates the collaborative environment needed to realize global engineering and flexible manufacturing. PLM platforms and their solutions enable you to extend your product design process to the production environment. They also allow you to perform real-time analysis of design intent and compare it against production reality. To address these requirements, Siemens PLM Software provides a collaboration backbone with key features that:

- Enable globally distributed product development teams to work together
- Facilitate flexible manufacturing on a global scale
- Connect suppliers to your process no matter where they are located
- Visually validate machine performance on both a behavioral and functional basis
- Enable manufacturing knowledge to be leveraged by product development
- Lower your cost of operations





## Solutions for heavy equipment machinery

#### **Mechatronics**

With today's increasing need to meet customerdriven, regulatory-driven and feature-related functional requirements that depend on electronics and software innovation, machines are becoming increasingly complex. Systems are more integrated, containing a myriad of functions to prevent, track and issue system failure alerts. To deal with this, heavy equipment machinery companies are taking a holistic approach to design that encompasses systems engineering, as well as electrical, mechanical and software design. A holistic approach requires value chains to look at early system layout and performance through complex hybrid 2D/3D layouts and digital engineering models.

Our PLM solutions enable you to realize these integrated designs by communicating requirements and changes consistently across your enterprise's functional disciplines. PLM facilitates a rich integrated environment that enables different disciplines to manage a single source of product and process knowledge. You can leverage this environment to provide clear transparency and traceability that each discipline needs to develop and manage iterative change. Our solutions enable you to reduce integration issues, accelerate complex design tradeoffs, increase functional re-use and synchronize your cross-discipline teams, as well as lower the cost of unforeseen engineering rework and speed up order delivery times.

#### **Serviceability**

Between 70 and 90 percent of a machine's lifecycle costs are incurred supporting and servicing the machine. Globalization trends are increasing the need for service centers, hubs and networks for machinery manufacturers around the world. Sustainability trends will increase demand for services to refurbish and/ or integrate environmental control systems in existing machines. So will periods of economic weakness in which manufacturers hold on to aging equipment longer. These practices



increase the business potential associated with service and maintenance, boosting revenues for service providers. While there is a huge untapped profit potential for both captive and noncaptive markets, many companies are not close to realizing this potential.

Our PLM solutions integrate your product definition, configuration and change history with its maintenance history. This enables service personnel to easily and accurately obtain all of the service information they need. Our solutions also improve engineering collaboration by facilitating closed-loop feedback from service teams, which enable your development teams to drive your nextgeneration products as well as improve your ongoing change processes.

In addition, you can leverage our solutions to decrease service time and cost by delivering product knowledge directly to technicians via personal computer (PC), tablet or smart phone. These initiatives enable you to speed service requests to closure and improve your first-time fix rate, thereby increasing customer satisfaction. From a marketing and sales perspective, these initiatives increase revenue and profit by enabling you to facilitate cross- and upselling, as well as recapture lost customers, increase your win rate and adopt new contracting models.





## Making real what matters for heavy equipment machinery manufacturers

Siemens is one of the world's largest and most respected companies, operating in more than 200 countries and employing over 340,000 people. This scope and experience provides Siemens with a unique understanding of the heavy equipment machinery industry's global business requirements. Siemens PLM Software technologies help bring together product and production lifecycles, facilitating unprecedented speed-to-market for industry-leading companies around the world.

Siemens PLM Software is helping its customers deliver increasingly more complex machinery in a marketplace that requires high reliability, short order delivery cycles, improved total cost of ownership and lower product development costs. A unified industrial PLM platform that brings the virtual and real worlds together facilitates an efficient bridge between production planning and the shop floor. This bridge delivers strategic advantages by providing innovation capabilities especially tailored for heavy equipment machinery manufacturers. The connection of the virtual and real world significantly improves cross-discipline collaboration while facilitating better and more accurate finished products, as well as faster time-to-market and faster time to full deployment.

Let Siemens PLM Software help you realize innovation in heavy equipment manufacturing.

#### **About Siemens PLM Software**

Siemens PLM Software, a business unit of the Siemens Digital Factory Division, is a leading global provider of product lifecycle management (PLM) and manufacturing operations management (MOM) software, systems and services with over 15 million licensed seats and more than 140,000 customers worldwide. Headquartered in Plano, Texas, Siemens PLM Software works collaboratively with its customers to provide industry software solutions that help companies everywhere achieve a sustainable competitive advantage by making real the innovations that matter. For more information on Siemens PLM Software products and services, visit www.siemens.com/plm.

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