KAMAZ

Largest Russian vehicle manufacturer cuts project times in half with Siemens PLM Software solutions

Products
NX, Teamcenter, Tecnomatix

Business challenges
Implement new projects in a digital environment
Standardize the design, analysis, simulation and manufacturing planning tools
Shorten vehicle development and manufacturing cycle
Enhance collaboration between designers and manufacturing engineers
Replace physical tests with digital simulation as much as possible

Keys to success
Support of KAMAZ management
Progress of the departments involved in the PLM project
Participate in joint ventures with partners such as Daimler, Cummins and Marcopolo
Partner with the Russian office of Siemens PLM Software
Leverage the strong position of KAMAZ in its traditional markets

KAMAZ reduces tooling changes by 50 percent and achieves more predictable product schedules

Adopting innovative technologies
The OAO KAMAZ Group (KAMAZ) is the largest vehicle manufacturer in Russia, and is 13th in the world in production of heavy trucks and 8th in automobile engines.
KAMAZ includes over 150 companies in Russia, the Commonwealth of Independent States (former Soviet Republics) and other countries around the world, and employs more than 45,000 people. The Group has assembly facilities in Vietnam, Kazakhstan, Pakistan and India.

The KAMAZ unified production complex embraces the entire truck production cycle, from development, manufacturing, vehicle and component assembly to sales and after-sales service. It has 12 large plants, including the primary production facility in Naberezhnye Chelny, Russia.
KAMAZ has established joint ventures to produce vehicle components with ZF Friedrichshafen AG, Cummins Inc., Knorr-Bremse Systeme Für Nutzfahrzeuge GmbH and Federal-Mogul Corporation, and truck assemblies with Daimler AG and Marcopolo S.A.

KAMAZ has been upgrading its truck family, introducing innovative technologies
and changing the workflows with the help of Siemens PLM Software. As a result, its entire production capability has become more efficient, compact and modern.

The project was started in 2006 and features a systematic and comprehensive approach to implementing product lifecycle management (PLM). KAMAZ relies on a variety of Siemens PLM Software products, including NX™ software, Teamcenter® software and Tecnomatix® software. KAMAZ experts have fully embraced Siemens PLM Software products as the products have enabled them to excel at performing digital manufacturing and truck assembly process simulation, which puts them ahead of most Russian manufacturers.

“The transition KAMAZ is currently making is a real breakthrough,” says Irek F. Gumerov, vice director general and director of development at KAMAZ.

“Providing top-notch support

After conducting a thorough evaluation process – KAMAZ not only compared the current capabilities of the competing systems, but they also considered development trends and the competence of vendor experts – they chose Siemens PLM Software. One of the primary reasons was the highly professional implementation and support provided by the Russian office of Siemens PLM Software. KAMAZ was also impressed with the list of Siemens PLM Software’s high-profile customer success stories as well as the number of Russian users.

“It should be noted that Daimler AG, a KAMAZ German partner, also recently switched to Siemens PLM Software solutions,” says Alexey V. Purtov, deputy head and chief CAD (computer-aided design) architect at KAMAZ. “That gave us extra confidence that we made the right choice.”

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Results
Completed projects of average complexity in half the time
Reduced tooling changes by 50 percent
Achieved more predictable product schedule
Reduced time-to-market for new models
Created a transparent product development and manufacturing process management system

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Alexey V. Purtov
Deputy Head and Chief CAD Architect
KAMAZ
As we implemented the Siemens PLM Software solutions to automate manufacturing planning processes, we learned that when everything is done properly – that is, tooling is designed in 3D using NX, manufacturing processes are developed using Teamcenter, and Tecnomatix is used for digital simulation to identify and rectify errors – use of Siemens PLM Software technology is paying off in a big way.

Irek F. Gumerov  
Vice Director General and Director of Development  
KAMAZ

To solve increasingly complex CAD and manufacturing tasks and to make KAMAZ vehicles competitive, the company has licensed and is using 355 NX seats and 1,255 Teamcenter seats. It is one of the largest single-company PLM deployments in Russia.

At the first stage of the PLM project, KAMAZ introduced the digital mockup technology and switched to 3D design. The digital document approval and change management procedures using Teamcenter have been fine-tuned; the computer-aided engineering (CAE) analysis procedures have also been developed.

The second phase, manufacturing planning automation, is going to be even larger. NX CAM (computer-aided manufacturing), Teamcenter and Tecnomatix are being used to provide an end-to-end design-production solution for KAMAZ that also covers assembly planning, CNC machine tool programming, classifiers and library development.

The PLM project is progressing steadily and is on the schedule. The company has already gained some obvious advantages from using the software, which is a good sign for those who are just beginning to use it.

Seeing tangible results
The launch of the new KAMAZ 5490 prime mover long-haul tractor, which was developed using NX, represented a milestone for the company and was a tangible result of the company’s technological breakthrough. The entire product line is being replaced as the company will make modern vehicles based on their new, unified platforms that are compliant with stringent environmental regulations. The advanced CAD/CAM/CAE and manufacturing simulation tools were widely used in the development process.

The model 5490 prime mover represents the result of a joint effort by KAMAZ and Daimler AG. The cabin design is based on a 3D model of the Axor line of trucks from Mercedes Benz; the powertrain and rear axle design have also been adopted from Daimler. Ninety-six of these trucks were manufactured in 2013. In 2014, 2,000 will be built as the company seeks to grab a share of a relatively new market.

Using Siemens PLM Software technology, KAMAZ has reduced tooling changes by 50 percent.
Soon KAMAZ is going to offer alternative truck configurations with a more comfortable cabin, and a new, proprietary engine. Additionally, the Russian Defense Ministry has ordered a new line of military transport from KAMAZ called the Typhoon, an armored vehicle that can be used for reconnaissance, command and staff, fire support and as a troop carrier.

**Benefiting from a unified environment**

Gumerov notes that while it can be a challenging task to evaluate the total value added by PLM: "Some indicators are easy to measure. One of them is schedules for similar projects. We have documented that we can develop a project of average complexity with the same headcount in half of the time. The PLM implementation facilitates concurrent development of many inhouse and government projects.

"PLM provides value when all the stakeholders work in the unified environment, and follow the unified regulations. It eliminates duplication."

Gumerov points out, "As we implemented the Siemens PLM Software solutions to automate manufacturing planning processes, we learned that when everything is done properly – that is, tooling is designed in 3D using NX, manufacturing processes are developed using Teamcenter, and Tecnomatix is used for digital simulation to identify and rectify errors – use of Siemens PLM Software technology is paying off in a big way. We found that digital technologies reduced tooling changes by over 50 percent, and we were much better able to predict project schedules.

"The shop floor personnel have also started to understand the value of PLM and the end-to-end development production cycle. With Model 5490, for the first time all the KAMAZ units are only using digital solutions. All product information is stored in the PLM system and is available to authorized personnel in the appropriate context.

"It's obvious to us that we should move forward together. We have a clear plan for the future, and we are jointly implementing it. I believe our partnership with Siemens PLM Software has a bright future."

Irek F. Gumerov
Vice Director General and Director of Development
KAMAZ
“Without PLM, it would have been impossible to develop complicated projects and meet tight deadlines. As a manager, I appreciate the fact that the PLM environment gives a transparent picture of progress with different projects. The development, document flows and personnel workload is easy to track within the system. Now we don’t have to guess how much has been done, and how much remains to be done. Thanks to PLM, project progress is transparent and available to every stakeholder.”

“Irek F. Gumerov
Vice Director General and Director of Development
KAMAZ”

“The deep involvement of Siemens PLM Software in the PLM deployment has provided us with world-class technologies and best practices.”