SIEMENS

AUTOMOTIVE AND TRANSPORTATION

Team Penske

Racing to streamline motorsport development

Products

NX, Teamcenter

Business challenges

Upgrade to new CAD/CAM/CAE and PLM solutions

Preserve and migrate legacy data

Extremely short time frame for cutover to the new solution

Pressures of fast-paced development

Keys to success

Use of Siemens Digital Industries Software Content Migration manager

Comprehensive preparation, planning and training

Assistance from Siemens training and migration experts

Scalability and efficiency of the data conversion process

Results

Preserved over 3 million legacy data items

Converted 200,000 product data files to NX format

Accomplished system changeover in a weekend

Team Penske changes CAD/CAM/CAE and PLM systems in record time

A legacy of success on the racetrack

Founded as Roger Penske Racing by legendary driver Roger Penske, Team Penske is one of the world's most successful racing teams, competing in NASCAR®, IndyCar® and IMSA racing series. Since 2007, all of Team Penske's North American teams have been located in North Carolina.

Like other racing teams, the pace of development is a key challenge for Team Penske. "We can have a new idea come back from the track two hours after the race on Sunday," says Drew Kessler, design engineering manager at Team Penske. "Then we are working on prototypes on Monday, we are making race car parts on Tuesday and Wednesday and we bolt them on the cars on Thursday and they go to the track on Friday. That's a very normal situation – and every project is unique."

Speed and creativity in engineering is at the heart of Team Penske's competitive advantage. "Motorsports is a unique industry in that we see what the competition does every weekend, and everybody eventually converges on the same solution and the same ideas," says Kessler. "We can win races by getting those ideas to the track faster than our competitors. Having well-managed PLM tools, CAD tools and programming tools in the machine shop, and collaboration with all of our partners is how we make

Team Penske engineers and manufacturing personnel attended on-site training classes that were split into ten half-day sessions, with different groups attending morning and afternoon classes so they could continue their work.

things happen more quickly than anyone else can. Of course there is a creativity aspect to coming up with unique solutions, but in our world, unique solutions don't stay unique to us for very long."

In 2016, Team Penske sought to replace the computer-aided design, manufacturing and engineering (CAD/CAM/CAE) and product lifecycle management (PLM) systems that it had used for more than 25 years. The company evaluated available systems and selected NX™ software for product development and Teamcenter® software for PLM from Siemens Digital Industries Software. With this integrated virtual environment, Team Penske can create digital twins of its cars and development processes to iterate through design concepts and engineer solutions in the high-intensity, short timeframe environment.

"From a technical perspective we thought the Siemens toolset was just a better fit for what we do," Kessler explains. "With Siemens, we knew we were moving to tools that have a long-standing reputation as industry leaders. As a CAD tool, NX was a much better fit for our day-to-day tasks, particularly in its strengths for surfacing and aerodynamic design. On the manufacturing side, we felt like NX CAM was a better fit for what we do. Teamcenter allows us to connect users outside of the engineering department, enabling them to access information they need for

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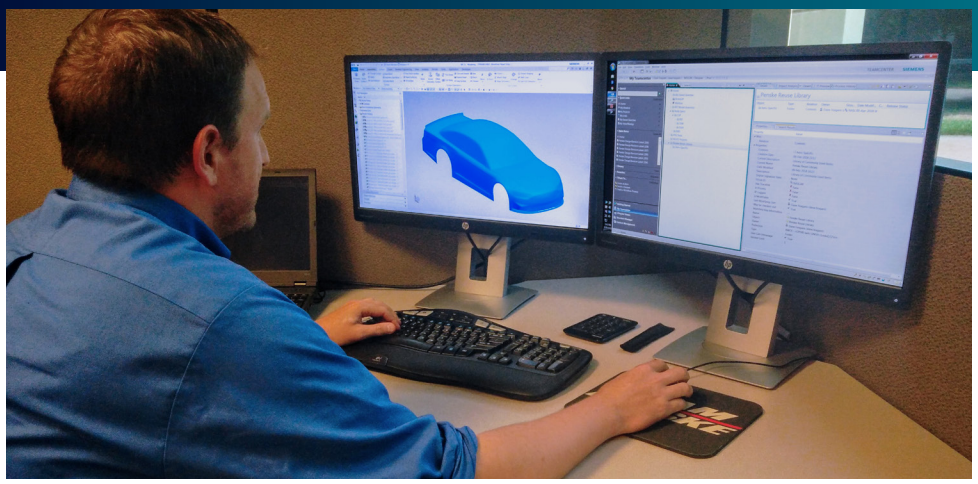

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Drew Kessler
Design Engineering Manager
Team Penske

accounting or manufacturing or stocking, whatever purposes that may be. Maintaining one single source of data was a big driver for us."

Team Penske's engineering team includes about 50 engineers countrywide, using 50 licenses of NX and Teamcenter, and the company has another 35 licenses of Teamcenter for use outside of engineering. The company does not have dedicated simulation engineers, but all of the design engineers use the Simcenter 3D tools of NX as needed, and ten of them are CAE subject matter experts and go-to personnel for engineering analysis projects. Ten licenses of NX are used in manufacturing, primarily for numerical control (NC) programming of Team Penske's machine tools, which include 5-axis machining centers, 3-axis mills, 2-axis and live-tool lathes, wire electrical discharge machining (EDM) equipment and 3D printing machines for additive manufacturing.

Changing engineering tools

Changing CAD/CAM/CAE and PLM systems is always disruptive, especially for the fast pace of Team Penske, which requires uninterrupted access to engineering tools and technologies they rely on daily. The successful migration to these essential new systems required careful planning and consideration. "Early on, we consulted with the Siemens services organization, trying to understand what these types of changeovers typically involve," says Mark Stewart, director of information technology at Team Penske. "This change touched a lot of people in their daily work. We started planning out the typical process, architecting the solution and understanding the available toolsets and the licensing structure, planning how to train our users and how to migrate and convert the data to bring everything out of the legacy system and into Teamcenter. We also considered how we could maintain the integrity and usability of the data. Our goal was to make the transition in three months, but we planned it for about 18 months."

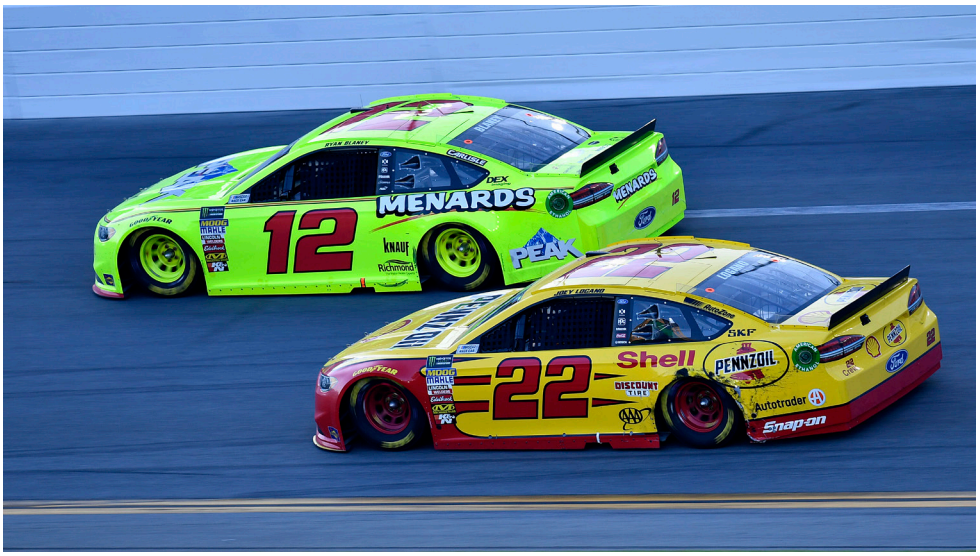
"Siemens helped align all the stars to make sure that we were able to achieve it in that time frame."

Drew Kessler
Design Engineering Manager
Team Penske

Fortunately, Team Penske was able to rely on Siemens' sophisticated tools and considerable experience in helping customers migrate from legacy systems. Siemens offers the Content Migration Manager, a solution that addresses the challenge of translating large amounts of legacy data, and other tools, services, and best-practice processes to support the migration. Team Penske followed the typical recommended two-step process. In the initial step, all of Penske's legacy data was loaded into Teamcenter in its native format, including geometric models, feature intelligence, assembly constraints, and metadata. In the final step, the Content Migration Manager software converted the data from the source CAD system to NX data format.

"We had a lot of legacy data – over 3 million items -- that would likely never be used again, but it's there if we need it," says Kessler. "We evaluated what all of the groups were working on and went through a culling process to select which data we needed to be converted to NX, and chose about 200,000 items. We prioritized those items for conversion and broke the conversion into batches that ran in parallel processes over a weekend. The software was really impressive."

Because of the volume of data and the short time frame, Team Penske dedicated additional computers – a total of 24 machines – to the processing effort. Following Team Penske's priorities, the Content Migration Manager software first converted part file, then assemblies that contained those parts, then drawings, and also converted all legacy system drawings to PDF files. The Content Migration Manager included tools for checking the integrity of the converted data, and reported its assessments of part and drawing data quality.



Solutions/Services

NX
siemens.com/nx

Teamcenter
siemens.com/teamcenter

Customer's primary business

Team Penske is one of the most successful teams in the history of professional sports. Competing in a variety of disciplines, cars owned and prepared by Team Penske have produced more than 400 major race wins, 450 poles and 27 national championships.
www.teampenske.com

Customer location

Mooresville, North Carolina
USA

Preparing users for the system changeover

Because Team Penske engineers and manufacturing personnel could not abandon their work to attend week-long training sessions, they attended training classes that were split into ten half-day sessions, with different groups attending morning and afternoon classes so they could continue their work.

"We worked with Siemens training and had several weeks of on-site training in three major areas. One was on the fundamentals of solid modeling and making drawings with NX," says Kessler. "Another was a course on surfacing for the development team that works with the wind tunnel testing and aerodynamics, to help them use the system effectively. We also had a training course for machining and NC programming. All of those happened roughly three to four weeks prior to the changeover."

Flipping the switches

Team Penske's objectives for the actual system switch were as aggressive as its engineering. "Our ultimate goal was to turn off the old system on Friday at 5:00 PM and then turn on the new system on Monday at 7:00 AM," says Kessler. "We didn't quite achieve that, but got very close – we turned the old system off on Thursday at noon and turned on the new system on Monday afternoon, and we had what we needed to start working. Siemens helped align all the stars to make sure that we were able to achieve it in that time frame."

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