

PLM IT REPORT

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**Clean data
provides the drive**

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Drive technology specialist, GKN Driveline, integrates the software used for product development via OpenPDM from PROSTEP. All figures: GKN Driveline

The integration of joint ventures in the PLM landscape places high demands on the way data flows are controlled in order to ensure not only that work can proceed efficiently but also that know-how is protected. GKN Driveline, the world's leading manufacturer of drive trains, uses PROSTEP's OpenPDM platform to provide its joint venture companies in China with all the required CAD data and synchronize this data following modification.

Just ten years ago, drive trains in passenger cars were purely mechanical assemblies. Nowadays, they are complex mechatronic systems containing relatively neutral mechanical components, while the characteristics required by the customer are provided by the software. "Software tuning makes it possible to modulate vehicle characteristics without having to modify the mechanical components," explains Steve Minter, Director Global Engineering IT at GKN Driveline in Lohmar, Germany. His global team of 25 employees is responsible for adapting and supporting the installed CAx/PDM base worldwide. GKN Driveline is one of the four divisions of the British GKN Group, whose roots go back more than 250 years. However, it was not until the eighties and nineties that business in the field of drive systems and vehicle solutions was developed through a series of acquisitions. With market share of over 40 percent, GKN Driveline is now the world leader for power transmission solutions for drive trains. The company employs some 26,500 people at 45 locations in 22 countries and achieved sales of approximately 4.6 billion euros during the last financial year. The division's product portfolio comprises side shafts with constant-velocity joints, longitudinal shafts, switchable all-wheel drive systems, as well as eDrive systems for electrical and hybrid drives. These products are used in the cars manufactured by almost every OEM, and GKN Driveline is exclusive supplier to many of them. While the three Technology Centers in Lohmar, the USA and Japan develop the underlying products, the 20 or so Application Engineering Centers located in every part of the world undertake customer-specific drive system adaptations.

The challenges of eMobility

Every year, GKN Driveline completes about 400 customer programs, each of which includes a large number of variants. It also develops mega-platforms, that is to say drive systems for two to three million vehicles that go into production at three or four different sites simultaneously. "To cope with the complexity of the products and processes, we need high-performance product data management," says Minter "We must be able to supply the up-to-date versions of our technical data to all our sites as otherwise we might suddenly start producing incorrect versions of our tools."

That is why the company's PLM strategy makes use of a central PDM system to which



Steve Minter, Director Global Engineering IT at GKN Driveline, and his team are responsible for adapting and supporting the installed CAx/PDM base worldwide.

all the sites are linked via a failsafe WAN connection. The central instance of PTC Windchill manages not only the metadata, but also the models and drawings from the CAD systems Creo, Catia and NX. Like many other automotive industry suppliers, GKN Driveline possesses a heterogeneous CAD landscape. What is more, the simulation experts save the results of their calculations in the PDM system. The PDM system is installed in the data center in the Italian town of Bruneck (Brunico), where employees have built up a wealth of Windchill-related expertise

3,500 GKN Driveline employees around the world work with Windchill and 500 of these are CAD users. According to Minter, a very high performance level is achieved thanks to the web-capable software and the use of corresponding WAN acceleration technologies to speed up data transfer. The PDM system also controls global change management, with version management of the software versions being performed by the application lifecycle management application (ALM) PTC Integrity. The two applications are due to be fully integrated during the coming years to make it possible to support cross-system requirements and configuration management.



Worldwide, 3,500 GKN Driveline employees work with the PDM system Windchill, including 500 CAD users of the products Creo, Catia and NX.

Migration from Enovia SmarTeam

Given its homogeneous PLM system landscape, it seems natural to ask why GKN Driveline needs OpenPDM. The PROSTEP solution is an open, standards-based platform for the integration and synchronization of different PLM systems and can also be used to support migrations. And this is precisely one of the use cases that had to be implemented at GKN. A few years previously, the enterprise had taken over the transmission business of Getrag, a company with two plants in the USA, one plant in Sweden and a development site in Cologne. The Swedish site managed its product data using the PDM system Enovia SmarTeam. To make it possible to integrate this site in global development projects, it was necessary to migrate the item master data, BOMs and the Catia data to Windchill. Although GKN Driveline was able to choose between a range of vendors, it decided, on PTC's recommendation, to work together with PROSTEP. One crucial determining factor was that the Darmstadt-based software and system house was able to demonstrate a standard solution with functioning connectors that could be flexibly adapted to meet GKN's specific requirements. Visits to prestigious reference customers such as Bombardier Transportation made it clear to the project team that they had found the right partner. "Cooperation with PROSTEP was excellent and the communication paths very short," says Minter. "It is precisely in the difficult project situations that regularly crop

up during complex projects that you need a reliable, expert partner. That is why we are sure we made the right decision."

PROSTEP adapted the solution to ensure that the data structures could be mapped to one another cleanly. The data was migrated from SmarTeam to Windchill on a project-by-project basis. The project managers in Sweden started by selecting the projects that were due for further development in the near future. Now, however, all the SmarTeam product data is available in the new environment, with the result that it has been possible to shut down the old PDM system in Sweden.

Harmonizing two Windchill instances

"Migration worked very well, even if it took longer than planned to clean up the data," says Thomas Niebeling Engineering IT Manager Europe & Asia. Paradoxically, the second project that GKN Driveline undertook in collaboration with PROSTEP proved to be more difficult, even though it "only" involved harmonizing product data between two identical instances of Windchill. "This surprised us because we thought we had a clean parts structure," continues Minter. GKN Driveline has been active on the Chinese market for a number of years and has an extremely successful joint venture company in Shanghai, Shanghai GKN Huayu Driveline Systems (SDS). The team in China manufactures certain products under license and receives the associated CAD data, which it adapts to meet the requirements of the Chinese market. The aim of the second project was to provide this data, via OpenPDM, in a separate Windchill instance and then synchronize it automatically when changes were made.

Previously, collaborations with joint venture companies demanded a lot of manual work and were constantly disrupted by discontinuities between media. In the past, GKN Driveline provided SDS with the Creo data via Projectlink. The Chinese design engineers made their changes in Autocad and then printed the drawings, which they then signed, scanned and stored in a separate document management system. As the number of handled projects grew, this way of working was no longer viable because it was liable to error and did not meet the documentary requirements. That is why GKN Driveline made the decision to provide SDS with a clone of its Windchill instance.

The problem of selecting the data scope

Getting the PDM system in China up and running was the least of the problems, even though the employees in the country had little experience of the system. The real challenge for the PDM experts in the data center in Bruneck was to select the data scope for initial entry in the system and make sure that not too much data was provided. This is where OpenPDM was able to show its strengths: "OpenPDM permitted the fine-grained filtering of the source data right down to attribute level, with the result that we were able to map even complex requirements. What is more, we were able to contribute to quality assurance thanks to other comprehensive reporting functions in OpenPDM," explains Mirko Theiss Senior Manager PLM System Integration at PROSTEP AG.

GKN Driveline wanted to migrate the PDM and CAD data together with the entire data history. Consequently, the data was entered in the Chinese instance following exactly the same chronology with which it had been accumulated over the years in Bruneck. Thanks to the OpenPDM interface, numerous inconsistencies were discovered. It was possible to correct recurrent errors automatically once the corresponding repair procedures had been defined in OpenPDM.

Quite apart from the inconsistencies, the data structure in Windchill had also not been initially set up with a view to collaboration with external partners or joint ventures. The CAD models are present in various libraries and are assigned to different teams and/or customer programs and only a subset of them need to be provided at any one time. The project team therefore had to develop a way of filtering the data at the required level of granularity and then synchronizing it, as Niebeling goes on to explain: "We have practically succeeded in doing this and will be able to complete the migration in the near future."

Payback within a year

Once the initial data has been imported at SDS, the data is to be synchronized via OpenPDM. During the initial project stage, the synchronization is only intended to operate in one direction. However, the Chinese have since announced that they need



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to be able to document their changes to models and drawings again in the original system. "In the medium term, we want to integrate our Chinese operations more closely in order to avoid errors, as these can prove to be expensive when you're working on a mega-platform," says Minter.

One immediate beneficial effect of the two migration projects has been a noticeable improvement in data quality. As Niebeling explains, GKN Driveline is now paying closer attention to the consistency of its data and has developed new, in-house tools to analyze quality and correct errors. "However, at the financial level as well, a successful migration pays for itself within a year when you consider the extra effort needed to support two PDM systems and take account of the time that well-paid engineers waste looking for information and exchanging data," stresses Minter. And this assessment does not even take account of other benefits such as the enhanced reuse of data. -sg-

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