

Automotive and transportation

Hino Motors

Truck manufacturer restructures its development process by using Teamcenter for unified data management, improving efficiency by 12 times

Product

Teamcenter

Business challenges

Access the latest data

Consistently manage truck-specific development data

Support product variations, team-based design and parts re-use

Design reviews and digital mockups of a large amount of data

Keys to success

Provide unified management with Teamcenter

Manage arrangement information as configuration information

Provide education and support tailored to the designers' work

Transform small-scale design processes



Hino Motors shortens the launch time of overseas production and improves design quality with Siemens PLM Software solution

Unifying data management

Hino Motors develops and manufactures trucks. In 1991 it introduced the world's first hybrid vehicle with the release of a hybrid bus. The company's products are sold in 80 countries and regions around the world, and its business is expanding globally with 75 percent of its manufacturing overseas and 25 percent in Japan.

Hino Motors installed 3D computer-aided design (CAD) software in 2005. The vehicle development department used CATIA® software while the engine development

department implemented Creo® software. With each department using a different CAD system, one managed the CAD data in an operating system (OS) folder while the other used a CAD-related data management tool. In 2012 the company evaluated systems for product data management (PDM) to satisfy the needs of a truck-specific development process and data management requirements, and chose Teamcenter® software from product lifecycle management (PLM) specialist Siemens PLM Software. Previously, design data had been managed rather loosely. However, by shifting to Teamcenter to facilitate the unified management of design data, the company was able to implement an environment that allows access to the latest data at any time by anybody.

Results

Reduced development time for 35 models

Improved efficiency by 12 times using data aggregation

Improved design quality

Shortened the launch time of overseas production



“We would not have made it through this launch without Teamcenter.”

Toshiaki Miyashita
Deputy General Manager
CAD Management Department
Advanced CAD · CAE Division
Hino Motors, Ltd.

This switch to Teamcenter paid off with reduced development time and improved design quality. Hino Motors has installed roughly 700 Teamcenter licenses and plans on expanding their use of the software to overseas locations.

Truck-specific development process

Hino Motors has multiple variations, such as the mounting position of the fuel tank, for the same model of truck. In fact, the company develops and produces over a thousand variations. Designers developing equipment, such as the batteries and fuel tanks, collaborate with other designers working on the arrangement layouts for the range of variations.

Design changes have a significant impact on this kind of development process. If the

position of the fuel tank changes on the truck, the related parts also have to be changed and simultaneously applied to between 100 and 200 models. For this reason, the shape of the equipment as well as the arrangement of information should be managed.

After the initial country launch the development proceeds in an intermittent fashion from one country to the next. The development projects for each country's specifications proceed in parallel with the specifications development for one country starting before the completion of truck development for another country, so there is frequent re-use of parts.

“The parts that are now being developed are used on other projects so if the design

is changed that has to be communicated,” says Toshiaki Miyashita, deputy general manager of the Hino Motors CAD Management Department, Advanced CAD · CAE Division. “In some cases, parts used in large-sized vehicles are also applied to mid-size vehicles, so re-use extends to various types of situations. To enable this kind of re-use, accurate data management is critical to keep up with the pace of product development.”

Consistent data management is a critical issue for a truck-specific development process with diverse variations, team-based design, simultaneous project execution and re-use of parts.

Difficulty gathering the latest data

When the designers were surveyed before the introduction of Teamcenter, 73 percent responded that they were troubled by the current situation. Many respondents in that group commented that they were unable to obtain the latest accurate data, could not share data or that gathering peripheral component data was challenging.

Miyashita explains, “We implemented Teamcenter with the goal of resolving these designers’ issues.”

Before installing Teamcenter, the designers manually collected the latest data. The company built an environment to allow anyone to access the latest data at any time. As a result, the design development workload has been reduced by 15 percent for 200 models. These numbers drew attention in the company because as Miyashita recalls, “To be honest, we were under pressure.”

The points of consideration for a truck-specific development process are data assurance and the management of arrangement information. The key reasons Hino Motors selected Teamcenter was due to its capabilities in the areas of unified management of the latest data, layout information management, viewer access of large amounts of data, support for team

design, data management for re-usable design and data management for two types of CAD.

“If you don’t set the rules for managing the arrangement information, you cannot place parts in the same position,” says Miyashita. “We want to assemble by deciding the arrangement information for each part and managing the information for an entire vehicle.”

The company was able to respond to these needs by keeping one set of equipment-related data without making any copies, and managing the arrangement information as configuration information.

There are other needs as well. “Due to the various vehicle models, when a change occurs we want to evaluate them side by side to see how other models are affected,” says Miyashita.”

Since CAD data is extremely slow for this type of application, the company decided to use the viewer to confirm changes with lightweight data. In addition, the company adopted the JT™ data format at the same time as the Teamcenter installation to enable design reviews and digital mockups of lightweight data.

“Ultimately, we want to be able to have the sales department input the specifications and know roughly how much the vehicle will cost, and then have that go to the production line to be manufactured.”

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After installing Teamcenter, the company reduced development time for 35 models. Most of the designers reported that as a result of the data assurance, data registration has become easier, data overwrites no longer occur and they are able to compile the latest data.

It used to take two people one week to gather the latest data for 10 vehicles, but after the installation in some cases one designer can collect the data for 60 vehicles (a 12 times improvement in efficiency).

In addition to reducing development time, Hino Motors now resolves issues as the project progresses. The development project is broken up into four separate stages, and previously it was not uncommon for issues to remain until the launch of the fourth stage. However, since Teamcenter was installed most issues are now resolved by the end of the third stage. The third stage involves the molds used in the actual manufacturing. For this reason, changes after this stage cause a significant increase in costs. The company has also realized improved design quality and reduced overall costs.

Recently the company released the new HINO 500 Ranger model. This truck is a third-generation vehicle with a different platform than was used on the initial launch into production at an Indonesian factory.

"We would not have made it through this launch without Teamcenter," says Miyashita.

This project was the first case in which the development was done in Japan and the initial production was launched overseas. The schedule was about 20 percent shorter than usual. The team members were concerned that they would not make it on time using conventional methods, but they were able to safely meet their deadline for the project by using the system built with Teamcenter.

Changing how design is implemented

Teamcenter was customized during installation, but Hino Motors is also striving to change how they carry out design work.

Miyashita explains, "There are many customizations. But these cost money to maintain, so we want to use the standard specifications. In order to do that, we need to somewhat change the way we carry out design work."

The company is advancing the discussion by consulting with the designers on whether to implement customizations or change the design work. As an example of aligning with the standard specifications, settings are entered precisely when registering CATIA data in Teamcenter. Updating a multi-product design that has one drawing that contains multiple drawing numbers breaks the configuration when it is updated, so the design department uses a standardized approach.

In addition, they also started examining design changes using the JT viewing capability instead of CAD. Normally, design changes involve detailed areas. Rather than open a large data set in CAD, the



Solutions/Services

Teamcenter
www.siemens.com/teamcenter

Customer's primary business

Hino Motors, Ltd. is a leading producer of medium and heavy-duty diesel trucks in Asia. It is a subsidiary of Toyota Motor Corporation and one of 16 major companies of the Toyota Group.
www.hino-global.com

Customer location

Hino-shi, Tokyo
Japan

designers use JT to open it in a viewer, confirm the change location and then modify that area in CAD.

"While there are improvements in the software and the system, we are also figuring out ways to improve how we work," he says. "That is providing synergistic benefits."

The successful integration of CATIA and Teamcenter makes Miyashita optimistic that "we will be able to integrate more tools into the combination of CATIA and Teamcenter."

Next steps with Teamcenter

The design department is not the only group seeing enhanced effectiveness due to the unified management of design data. Recently, the use of CAD data for catalog production is also showing results. Previously, vehicles were photographed for catalogs, but now Hino Motors users are able to use CAD data to create computer graphics and renderings. Applying this approach to the production of 10 vehicle catalogs has reduced costs by roughly ¥100 million.

Currently, the production engineering department is implementing Teamcenter



Manufacturing, and it is only being used for digital mockups. "However, we hope to use Teamcenter Manufacturing to manage the mold data, operation manuals and factory layouts to achieve results far beyond design," says Miyashita.

In addition, there are also various types of data and systems for cost management. By integrating those systems, the company aims to expand the system for use across its entire product lifecycle.

"Ultimately, we want to be able to have the sales department input the specifications and know roughly how much the vehicle will cost, and then have that go to the production line to be manufactured," says Miyashita.

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