

Automotive and transportation

Shonan Design

3D development process improves vehicle prototype design

Products

NX, Parasolid

Business challenges

Reduce development cycle

Improve design quality

Boost efficiency of sales activities

Keys to success

Use of 3D data for the entire design process

Rich engineering applications of NX

Synchronous technology

Seamless coordination between design and engineering

Results

Rework reduced by 40 percent

Design cycle reduced by 30 percent

Improvement in overall design quality

Success rate for importing customer data is nearly 100 percent

Mold Wizard reduces mold design work by 40 percent

A single data format from design through engineering boosts productivity and reduces rework

Experts in prototypes

Established in 1967, Shonan Design Co., Ltd. (Shonan Design) manufactures large-scale prototype models for customers in the automotive and consumer product industries. Shonan Design handles the entire product development cycle, from product design to mold design and manufacture. Its wide range of services includes market research, design sketches, conceptual design, detail design, clay modeling, die manufacturing, rapid prototyping and prototype manufacturing.

Shonan Design consists of three major divisions: the Automotive Development Division, which handles automotive

mechanical component design and show cars; the Motor Sports Division, which is in charge of design and production for prototype development and extra-hard material, high-precision milling; and the Product Development Division, which delivers design-through-prototyping services for video cameras and cell phones. All divisions have established a 3D development environment, and have consolidated the management of all data related to product development (from design to manufacturing). This investment has given Shonan Design a leadership position in its industry.

3D from the start

Shonan Design's Automotive Development Division has seen a huge improvement in the productivity of its development process since deploying NX™ software from Siemens PLM Software. Before NX, 3D





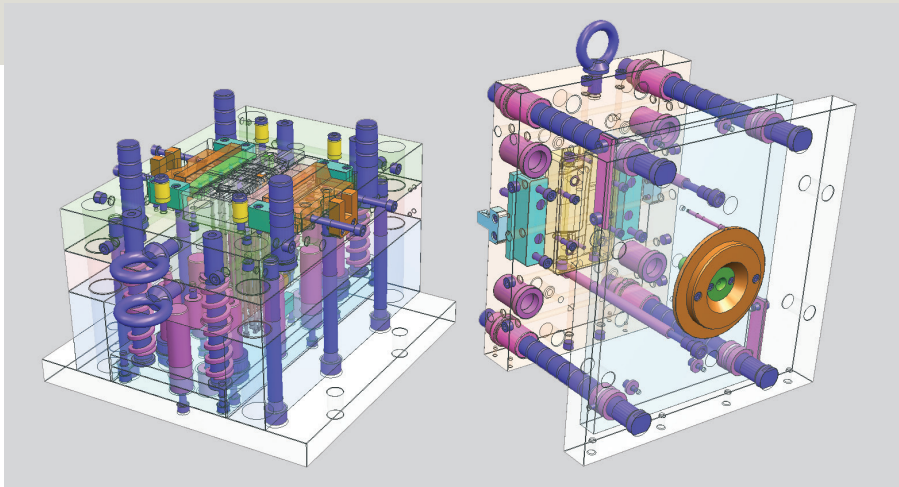
The first 3D tool to be deployed was a 3D scanner and dedicated surface modeling system. After design approval was obtained, these tools were used to make measurements, and these measurements were then imported so that surfacing work could begin. Because this work had to be carried out with every design change, it was not unusual for it to take six months from the time a design was finalized to the completion of the clay model. Also, as the created surfaces could not be used in that form in the workshop, they had to undergo modeling through a different system, requiring even more time.

A major change came when Shonan Design deployed NX. With this solution, immediately after the design sketches are created, designers start creating a digital model with NX. The first clay model is made using NX surface data. Since surfacing with NX allows data to be edited parametrically, the time required for rework (whenever there are design changes) is dramatically reduced. This process has shrunk the cycle time for this stage of the process to 70 percent of what was previously required. The time saved has enabled Shonan Design to take on the very fine detail work that was not possible previously due to time constraints. This has dramatically improved final design quality, and almost no design changes are required after the full-scale clay model is completed.

computer-aided design (CAD) and related tools were not used until after a design was finalized. Designers drew sketches, then developed scale models of the vehicle, and later a full-scale clay model was created for final approval.

"We use NX to create and evaluate Class A surfaces," says Katsumi Kuroki, executive managing director of the Automotive Development Division. "This has eliminated the process of creating a mold and

Shonan Design has reduced rework by 40 percent using Siemens PLM Software solutions.



“When the only thing in my hand is one sketch and I have no idea about how to model it, the important thing is the flexibility of the CAD system, and what is great about NX is that flexibility.”

Alvaro del Campo Barcena
Designer
Shonan Design

“The use of NX synchronous technology and tooling applications (Mold Wizard, Progressive Die Wizard) has shortened our overall mold design workload dramatically.”

Shinji Nakajima
Director
Product Development Division
Shonan Design Co., Ltd.

then pressing the sheet metal to check the surfaces, significantly improving the speed in vehicle development.

“Since deploying 3D, we are able to include design specifications into the design data during the early phase of development, reducing the amount of rework,” Kuroki continues. “This rework was reduced by 40 percent.” As all of the design data is standardized using NX, the company can now oversee and share what is going on in the entire development process.

Seamlessly connected design and engineering

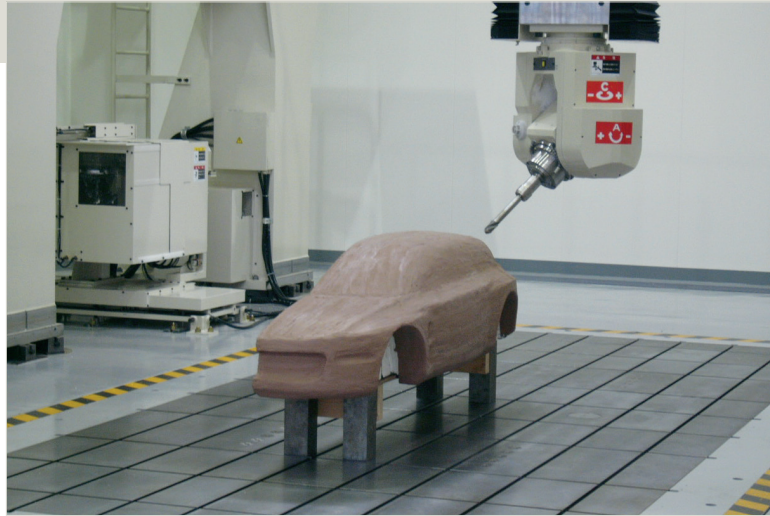
“One of the most important things during design activities is the transition from sketch to design,” says Alvaro del Campo Barcena, a designer at Shonan Design. In a sketch, any kind of geometry is possible.

But after starting design, the company always found inconsistencies. Creating geometry using a 3D CAD solution such as NX makes it possible to confirm if the idea in a sketch is possible or not.

“When the only thing in my hand is one sketch and I have no idea about how to model it, the important thing is the flexibility of the CAD system, and what is great about NX is that flexibility,” says Campo Barcena. “Another superior aspect of NX is that I can evaluate whether what I sketched is feasible in terms of engineering.” Since engineers and designers use the same software, design and engineering can take place concurrently. Seamlessly connecting design and engineering, which was previously a major challenge, is now realized with the common platform, NX.

“Being able to include vehicle design specifications in the 3D model during the early phase of development has reduced our overall workload significantly, while achieving higher quality.”

Katsumi Kuroki
Executive Managing Director
Automotive Development
Division
Shonan Design Co., Ltd.



Kuroki adds, “Being able to include vehicle design specifications in the 3D model during the early phase of development has reduced our overall workload significantly, while achieving higher quality.”

Shonan Design has standardized on the Parasolid® software data format since deploying NX. This makes it possible to conduct the entire development process, from design to manufacturing, without any data translation, eliminating all of the work that previously went into checking and fixing translated data. “Previously, we imported data in STEP (Standard for the Exchange of Product model data) or IGES (Initial Graphics Exchange Specification) format, and almost always we needed to fix the data before using it,” says Shinji Nakajima, a director in the Product Development Division. “This was a problem because the prototyping industry expects rapid delivery. Using Parasolid, the data can pass to the manufacturing phase immediately.”

Production productivity

The use of NX also contributes to improved productivity in the production process. Mold production, which represents one of the highest-volume activities at Shonan Design, starts with the receipt of customer data. The challenges involved here include incorporating production requirements into the design of the mold, and responding promptly to frequent design changes.

Mold designs that do not incorporate production requirements can be used for mold development, but major problems often occur while forming parts. Also, even on projects with very tight delivery deadlines, there can still be frequent design changes. If too much time is taken for evaluating what is changed, the time to complete changes can be doubled or even tripled. Previously the company could only visually check what was changed in the geometry. Although major changes could be easily confirmed this way, it was difficult to check every minor fillet. The company had to spend a great deal of resources to meet the delivery deadlines in these situations.

By using NX Mold Wizard, one of the NX application modules, it is now possible to confirm detailed and minute changes without any extra effort. Very small changes are no longer missed, which has shortened cycle time while also improving product quality. Nakajima provides perspective: “Why have we chosen NX? One of the major reasons is the rich application tools in NX, including Mold Wizard.”

Furthermore, the synchronous technology capability of NX also contributes to Shonan Design’s success. Most of the customer data the company receives cannot be used as-is for mold design. Approximately 80 percent of the data for an electronics product, for example, must be corrected

Solutions/Services

NX
www.siemens.com/nx

Parasolid
www.siemens.com/plm/parasolid

Customer's primary business

Shonan Design specializes in prototype design and development for customers in the automotive and consumer electronics industries.
www.shonan-d.co.jp

Customer location

Kanagawa, Japan

before moving on to the mold design. In some cases, geometry is missing. In other cases, bosses and ribs are detached from the base geometry, so Shonan Design must confirm intent with the customer first before correcting the data. Also, with other CAD systems, it is difficult to modify imported geometry. NX with synchronous technology has changed this situation dramatically. "With synchronous technology, we can manipulate geometry in any manner," says Nakajima. "This has hugely improved the productivity of geometry modification."

The NX data that Shonan Design creates during design and engineering is widely leveraged for use in sales and employee training. This data is also used for customer presentations, and is used on iPad® portable electronic devices as part of sales presentations. The visualization functionality of NX also works as an effective presentation tool. For example, internal discussions between designers and engineers use the NX visualization tool to ensure common understanding. It is no longer necessary to take notes and then make the changes later. This greatly reduces the time required for changes.

At Shonan Design, both the design and engineering departments use NX intensively. It serves as a common platform, and its visualization functionality accelerates their collaborative work. This has significantly shortened the development cycle, compared to the company's previous sequential process. The use of NX 3D data as master data has led to the improved productivity of Shonan Design's entire development process. Until now, Mold Wizard and Progressive Die Wizard have been used to make partial contributions to the improvement, while synchronous technology brings powerful functionality for geometry modification. Overall, the use of NX provides significant contributions in helping make Shonan Design even stronger in its industry. "The use of NX synchronous technology and tooling applications (Mold Wizard, Progressive Die Wizard) has shortened our overall mold design workload dramatically," Nakajima explains.

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