Customer
Case Study

CATIA enables Nikon to speed through the design process

With CATIA, Nikon designers can turn their vision into reality, using real-time rendering to produce images of photographic quality

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CATIA, Nikon and the communication of ideas

CATIA chosen for its intuitive interface

Since its establishment in 1917, Nikon has developed and produced optical devices such as cameras, binoculars and microscopes. Currently, it operates in a wide variety of business areas.

The 2D design process used by Nikon's Camera Design Department did not allow designers to smoothly communicate the true scope of their ideas and images, and so the Mold Tool department requested 3D surface data. This led to the introduction of 3D CAD systems in the Industrial Design Department.

Since it was important for designers be able to use the new 3D CAD system themselves, the Industrial Design Department chose CATIA V5.

CATIA 3D data translated into molds

The Camera Design Department of Nikon adopted CATIA V5 in 2001. With CATIA, designers can incorporate their vision into the images by using real-time rendering that produces images as if they were photographs.

"One of the appealing aspects of CATIA is the well-developed surface function in addition to the solid function," said Mr. Ken Moro, Executive Staff, Industrial Design Department, Imaging Company, Nikon. "With these functions, it's possible to generate any curved surface that designers come up with. Also, through feature-based modeling and the easy-to-see history tree structure, it's extremely easy to make modifications."

For complicated products, such as SLR cameras, the designers study and set draft angles so that their 3D data can be used in tooling preparation. This has resulted in the prevention of rework in the mold creation phase.

"In addition to shortening the development period, a great advantage of using CATIA is that it allows designers to smoothly create the detailed exterior, while understanding, in advance, the mechanical design and maximum capability of the Production department through close communication with the Mechanical Design and Manufacturing department," said Mr. Ken Moro.

CATIA perfectly suited for Nikon's 'stubborn' camera design work

"Nikon's camera design work is characterized by its 'stubbornness'," said Mr. Akira Nojima, Executive Staff, Industrial Design Department, Imaging Company, Nikon. "In order to optimize the image and ease of use, designers repeat the process of design creation, evaluation, and modification a large number of times to improve the product design. For example, they will respond to a user request to move the shutter up by 0.1mm. Although doing so only requires moving the button location slightly, the designers will redesign the whole camera and bring every detail of design to perfection."

For compact digital cameras, CATIA is best-suited to free-form surface creation using the surface function.

"The most important point to consider in designing single-lens cameras is that they will be hand-held. It's necessary to optimize camera handling as well as button and dial locations, and then design the style. CATIA is a very reliable tool for our designers since detailed and fine adjustments like these can be quickly incorporated into a 3D shape," said Mr. Akira Nojima.

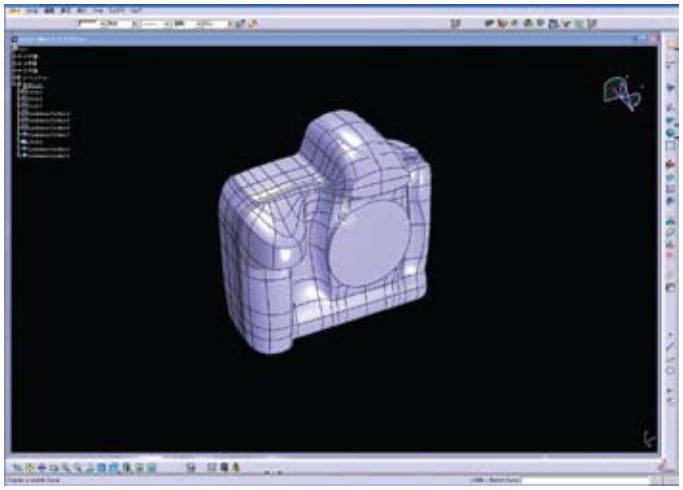
"For compact digital cameras, CATIA is best-suited to free-form surface creation using the surface function."

Cutting design time by two-thirds increases competitive advantage

The design of the Nikon D3 digital SLR camera is a good example of Nikon's design approach. Firstly, the camera is separated into three parts: the pentaprism and shutter which dictate the characteristics of the camera; the body; and the grip. For each part, the designers review requests from the engineer and create the layout.

"Before we started to use 3D CAD systems, we created product designs like sculpture, carving out the shape from a block or adding a chunk on that shape," said Mr. Akira Nojima. "We create 3D shapes in the same manner, using the solid modeling function of CATIA. We first explore the optimal allocation of operating units and feel of the grip in a block, then create a mock-up using the 3D data. Since an ever increasing amount of information is required to create an industrial design, it's essential that we are able to quickly assess all necessary functions and promptly examine them. Since CATIA allows us to quickly make modifications as small as in increments of 0.1mm, we are able to check the image immediately. We also use functions such as computer graphics, real time rendering, and 3D texturing."

In the field of SLR cameras, the trend shift from film cameras to digital cameras has reduced development cycles.



CATIA model of Nikon D3 digital SLR

"For Nikon designers, CATIA has become an essential tool. CATIA has overwhelmingly improved efficiency, reducing the design lead time down to one-third. Mock-ups are currently created three to four times before finalizing the shape, and we believe that the key to improving product competitiveness is to further reduce the design period and improve the quality without increasing the number of mock-up creations," said Mr. Ken Moro.

Nikon's future plans include using 3D data in its marketing activities.

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Nikon corporation

Establishment: July 1917
Capital: 64.675 million Japanese yen (as of March, 2008)
Representative, Director, President, CEO and COO: Michio Kariya,
Number of employees: 25,342 (consolidated) / 4,861 (unconsolidated). As of March 2008. URL: www.nikon.com

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