SPACECLAIM CORPORATION

Hioki E.E. Corporation streamlines its product development process with SpaceClaim

CASE STUDY

Hioki E.E. Corporation has a long-standing tradition as a respected manufacturer of electrical measuring instruments geared toward R&D, production lines, and field maintenance. Hioki has developed several groundbreaking products, has been a yearly recipient of the Good Design Award, and continues to develop innovative products. Its reputation earned the Company's rank of 15th out of 4,000 in innovation (2009) by a highly respected Japanese business magazine. Hioki products are often used in solar-generated electricity, fuel cell, and electric vehicle development, all of which aid in global environmental conservation.

Research from Hioki's R&D department drives new product development. To streamline the process, Hioki's Software and Mechanical Design departments foster a multi-disciplinary approach to research. From the initial stages of development, Hioki assesses new products in terms of quality, the environment, and safety, and, when products are released, Hioki continually promotes dialog with the market.

Recently, Hioki has implemented SpaceClaim® to improve this process.

ABOUT HIOKI E.E. CORPORATION

Hioki E.E. Corporation is a manufacturer of electrical measuring instruments. Products include automatic test equipment, memory recorders, electronic measuring instruments, and field measuring instruments. These products are used across a wide variety of fields, including research and production. Hioki was founded in 1935, has 645 employees (as of December 31, 2008, including subsidiaries and affiliates in the Hioki Group), and is listed on Section 1 of the Tokyo Stock Exchange.

HIOKI

THE DEVELOPMENT CHALLENGE

Hioki's development environment primarily uses SolidWorks for traditional CAD, but also includes a diverse set of CAD and CAE tools such as Pro/ENGINEER and ANSYS. In addition, Hioki uses specialized modeling and rendering tools throughout the design process. Its philosophy is to use the best possible tool for each problem to create a highly competitive, simulation-driven product development process. Hioki also manages its design, planning, and analytical data separately, thereby increasing its expertise, efficiency, and quality in each discipline while maintaining its competitive edge as an innovative company. This approach has made it possible for the company to achieve its aggressive objective to be the first to deliver new products to an ever-evolving market. However, this approach presented a challenge: How can Hioki integrate traditional CAD while reaping the benefits of best-in-class, discipline-specific CAD and CAE tools?

Additionally, in order to model and optimize multi-physics problems, such as fluid dynamics coupled with mechanisms, Hioki needed to create a seamless linkage between tools. Being able to efficiently solve such problems is a key part of Hioki's strategy, and its R&D leadership envisions multi-physics becoming increasingly prevalent throughout engineering. To meet this objective, every professional engineer in each discipline must be able to edit models while keeping them consistent with the model's specifications.

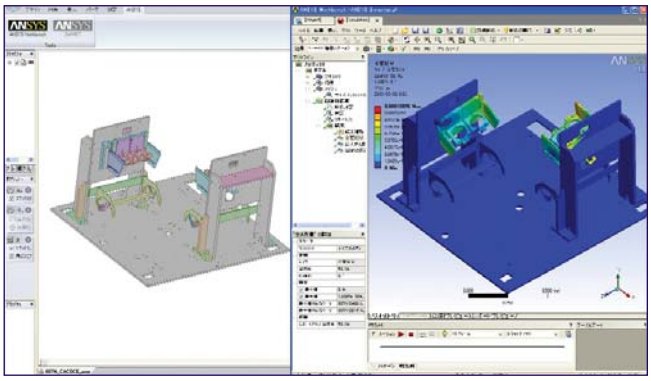
SPACECLAIM INTRODUCTION

Hiroshi Mizuide, Branch Manager of the Development Promotion Section of the Development Department in Hioki's Engineering Division, has always kept a close eye on the progress of engineering tools. He discovered SpaceClaim at a trade show, where its modern, novel user interface caught his eye. Mizuide had previously thought that the features of basic CAD were unnecessary upstream of CAD, including the areas of planning, analysis, and production engineering. However, after seeing the demonstration of SpaceClaim's Direct Modeling technology, he evaluated SpaceClaim and introduced it to the organization.

SPACECLAIM OPERATION AND EFFECT

Before SpaceClaim was introduced, industrial designers had to import models designed in SolidWorks into the rendering tools. Not only were there conversion errors, but editing the imported models was challenging. The designers were therefore dependent on the SolidWorks users. Now, with SpaceClaim, a industrial designer can open a model and easily move the SpaceClaim model into the rendering application, eliminating the dependency on CAD operators and making it possible for the designer to focus on decision-making related to the product design problem at hand.

Hioki E.E. Corporation streamlines its product development process with SpaceClaim



Static structural analysis of a production fixture using SpaceClaim and ANSYS.

At Hioki, the analysis team receives a model designed using SolidWorks or Pro/ENGINEER and must analyze it using a CAE tool. Previously, simulation engineers used CAD systems to simplify the shape of the model and apply a mesh. However, because engineers were not typically CAD experts, they would waste hours every day making small changes. Now, the analysis team uses SpaceClaim, where they can quickly and easily make changes, significantly increasing efficiency. Unlike with traditional CAD, the engineers are able to intuitively use SpaceClaim after a short training period.

SpaceClaim's bi-directional integration with ANSYS has been highly compelling to engineers at Hioki. After the analysis team receives SolidWorks and Pro/ENGINEER models from the design department, analysts can simplify and edit the models without assistance from the CAD team and without information about the history of the design. In addition to its Direct Modeling capabilities, SpaceClaim's model preparation tools expedite otherwise tedious tasks such as deleting fillets and removing small faces. SpaceClaim scales well: the more complicated the model, the better the time savings. In challenging multi-physics problems, such as electromechanical coupled analysis, SpaceClaim also enables electrical engineers to make model changes to mechanical parts.

Simulation engineers manage their analysis data separately from traditional CAD and product management tools. SpaceClaim's CAD-neutral approach has significantly reduced the simulation team's reliance on other groups, achieving considerable time savings for both the simulation and CAD teams.

"Although data is exchanged between each tool, SpaceClaim significantly streamlines the procedure for making model changes, effectively improving overall efficiency and resulting in a workflow that is clearly better than our previous data exchange methodology. Changes that previously had required several hours can now be completed in 30 minutes. Also, the tool helps us find optimal solutions while meeting cross-discipline objectives. Previously, when analysts changed CAD models, there was the risk of mistakenly changing critical design data. Introducing SpaceClaim has reduced this risk as well. Now all engineers can use SpaceClaim without interfering with the overall workflow," remarked Hiroshi Mizuide, Branch Manager, Hioki E.E. Corporation.

FUTURE EXPANSION

In the near future, Hioki hopes to expand its use of SpaceClaim into rapid prototyping. After creating new concepts or opening CAD models in SpaceClaim, Hioki can simplify the parts and fabricate them using 3D printers, which help validate a design concept. SpaceClaim also offers sheet metal design capabilities, which Hioki plans to use when modeling housings. Additionally, to enhance simulation-driven development, Hioki intends to expand SpaceClaim into multi-physics systems incorporating thermodynamics, hydrodynamics, and mechanical systems. Hioki looks to introduce inter-discipline simulation in the early stages of development and believes this cannot be achieved without SpaceClaim.

"The argument for streamlining by enforcing a single CAD platform is a thing of the past. The goal is to streamline the workflow while introducing the best tools for every job. Although a mix of tools comes at higher support costs, reducing wasted time in engineering and getting products to market faster is what gives us our competitive edge. We have achieved this goal by empowering our engineers with SpaceClaim."

Hiroshi Mizuide
Branch Manager,
Hioki E.E. Corporation

SpaceClaim model of a power analyzer. This product has proven effective at measuring and assessing solar-powered generation systems.

SPACECLAIM CORPORATION
150 Baker Ave. Ext., Concord, MA 01742 USA
Tel: +1 978.482.2100 Fax: +1 978.369.5864