

## Industrial machinery and equipment

# Hitachi Construction Machinery

Improving quality and innovation enables Hitachi Construction Machinery to preserve its industry reputation

### Products

NX, Teamcenter, Tecnomatix

### Business challenges

Manage data throughout the product development process within a synchronized managed development environment

Maintain close-knit collaboration with locations outside Japan while initiating global design operations

Establish a secure information sharing infrastructure that will support global expansion and collaboration

### Key to success

Implement NX software and Teamcenter software to achieve the synchronized management of product data and process knowledge

### Results

Shorter lead times for handling higher design volumes

Real-time design made possible by effective data sharing

### Synchronized managed development environment enables streamlined data sharing

Hitachi Construction Machinery leads the world in integrating IT technology into construction machinery, crediting its success to "3D Plaza Design," which powers product modeling design operations.

### World's leading producer of intelligent power shovels

Japan's Hitachi Construction Machinery Co., Ltd.'s (HCM) main product line is hydraulic excavators, with the company manufacturing many models, from medium-sized and mini excavators all the way up to 780-ton ultra-large excavators. HCM is a leader in the area of construction machinery, and has manufacturing facilities in Europe, the U.S. and Asia. HCM also markets wheel loaders, off-road dump trucks, tunnel boring machines and other products made by HCM Group companies or in partnership with major manufacturers.

HCM launched the first power shovel made entirely from Japanese technologies in 1949, and since that time, the company has maintained its industry leadership position. In 2000, the company introduced ZAXIS, the world's first series of power shovels equipped with IT capabilities. It continues to aggressively implement IT



technologies into its construction machinery to this day. The company has named its 3D product modeling approach "3D Plaza Design," using this concept in every stage of development – from initial design, through the design review process, actual product manufacturing and quality assurance.

"The major goal of the 3D Plaza Design concept is to achieve 'pre-assurance' of quality before actually moving forward with the physical development of a product," explains Yamato, manager of Hitachi Construction Machinery's Software Development Division. "By using 3D modeling in the early stages of development, we are able to accelerate the design

### Results (continued)

Elimination of errors common with manual data transfer

Increased product quality

Higher levels of innovation in overall product development

review process through faster validation of design concepts, and then modify these concepts based on the results of the design review prior to going any further in product development. This in turn allows us to improve overall quality and build higher levels of innovation into our products. We have a virtual plaza that simplifies this process called the '3D Plaza Room.' In this 3D Plaza Room, participants can easily engage in the review process and identify potential problems while the product is being designed."

### Widespread adoption expands benefits

To further enhance the benefits of this process, HCM has extended 3D product modeling into a wide variety of areas. In addition to design operations and digital simulation and validation, the company is using 3D modeling throughout most of its operations, such as in evaluating product maintainability and visibility, creating NC data and teaching robots during the manufacturing phase – as well as creating parts, product catalogs and marketing materials. HCM uses NX™ I-deas™ software (part of Siemens' NX digital product development

portfolio) for all 3D modeling, with Tecnomatix® software providing the human modeling functionality. NX operates within an integrated managed development environment, which utilizes Siemens' Teamcenter® software for data sharing and visualization.

"When we began using 3D modeling on a full scale, we realized that data management would become a critical challenge for us," explains Yamato. "In particular, with the globalization trend of the design process, it is critical to establish a data management system that enables trouble-free collaboration with our divisions outside of Japan. In addition to our development and design center here in Japan, we currently have development locations in China, Europe, North America and Southeast Asia. In particular, our China and Japan locations have a very close-knit relationship. It was a prerequisite for us to be able to share the latest information and data between these two locations to achieve efficiency in our development process and improve the overall quality of our designs."

**“With a fully integrated managed development environment, it is so much easier to move the design process in parallel with other operations. Distributing the design duties to locations throughout the world has accelerated the design process for even large volume jobs.”**

Kouichi Yamato, General Manager  
Engineering Information System Dept.  
Hitachi Construction Machinery Co., Ltd.

“The implementation of NX, Teamcenter and Tecnomatix has resulted in a variety of benefits, including the realization of a global development environment, greater quality, increased security and the reduction of hassles and errors related to data transfer.”

Toshiaki Sukada, Group Manager  
Engineering Group  
Production Systems Group  
SI Division  
Hitachi Kenki Business Frontier Co., Ltd.

Through the use of Siemens’ technologies (NX, Teamcenter and Tecnomatix), HCM has been able to establish a global development process in a secure environment. The ability to control each user’s access to visual data has dramatically improved security management. The company has also significantly reduced errors related to data transfer. This is the result of team members sharing “associated data.” Moreover, manual data transfer has become completely unnecessary. Siemens’ PLM capabilities have helped HCM significantly improve quality, innovation and time-to-market.

#### **Global design “from one virtual building”**

An example of how this new system is working effectively involves two groups – one in Japan and another in China – that effectively share data in the Teamcenter managed development environment. When drawings are checked in to the work group server located in China, the metadata is stored in Japan and the actual data

is stored in China. When drawings are checked in on the Japan side, both the metadata and actual data are stored on the Japan side. By using this system of centralized management for the metadata and distributed management for the actual data, HCM has succeeded in holding the network load to a minimum, and created a system in which data can be shared effectively. HCM has also automated exclusion controls and security access controls.

“It is so much easier to move the design process in parallel with other operations now that we are able to share data in real time,” says Yamato. “It is as if we were performing our global designs all in one building. Distributing the design duties to locations throughout the world has accelerated the design process for even large volume jobs and made it easier for us to develop more variations of products in a shorter period of time.”

Improving the data sharing relationship between teams has also resulted in major



## Solutions/Services

NX

[www.siemens.com/nx](http://www.siemens.com/nx)

Teamcenter

[www.siemens.com/teamcenter](http://www.siemens.com/teamcenter)

Tecnomatix

[www.siemens.com/tecnomatix](http://www.siemens.com/tecnomatix)

## Customer's primary business

Hitachi Construction

Machinery's main product line is hydraulic excavators. The company also markets wheel loaders, off-road dump trucks, tunnel boring machines and other products made by HCM Group companies or in partnership with major manufacturers. [www.hitachi-c-m.com](http://www.hitachi-c-m.com)

## Customer location

Ibaraki

Japan

benefits domestically. Formerly in Japan, data was shared via physical packages literally transported between the design and manufacturing teams, and even among the design teams themselves. Using Teamcenter, HCM was able to eliminate the costs associated with this awkward and error-prone manner of data distribution. In fact, in the previous method of data sharing, it was difficult to ensure that the most recent files were even being used. However, with the Teamcenter-enabled managed development environment, HCM now shares the data in real time, which has resulted in a significant improvement in overall business process especially in terms of speed and accuracy.

Teamcenter has also enabled HCM to integrate its legacy drawing management system (created during its 2D design period) into the process. Design data is locked the moment it is automatically input into the managed development environment and the corresponding information is

automatically registered in a drawing management system. Whenever design changes are made, designers can unlock the design data simply by performing "borrowing procedures."

In the future, HCM plans to more fully extend its product lifecycle management system with the implementation of additional

Teamcenter capabilities. HCM also plans to digitize its work flow system and approval process. "We want to go forward with knowledge sharing," adds Yamato. "We already have a variety of databases within our company. We would like to consolidate these to achieve significant improvements in terms of process navigation."



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