CUSTOMER CASE STUDY

EPSON
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> “In the long term, we want to make FJVPS the ‘Master’ of 3D manufacturing, by combining FJVPS with product data management.”

Keiji Yamaoka
Section Manager, Equipment Information
Seiko Epson Corp

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shaping tomorrow with you

At a glance

Country: Japan
Industry: Technology/Electronics
Founded: 1942
Employees: 67,000+
Website: www.epson.com

Challenge

Seiko Epson wanted the ability to study assembly line productivity before it engaged in the detailed design process in order to reduce costs and improve efficiency.

Solution

Seiko Epson introduced a technology platform, FJVPS, which uses 3D-CAD data to inspect and review designs, improve productivity and prioritize the duties of production preparation.

Benefit

- Mass-production line efficiency has improved by up to 20 percent, compared with conventional manual design
- Production capacity has increased through reducing assembly time by up to five minutes
- Shortens the period for manufacturing start-up by approximately three months for faster time to market
- The number of overseas engineers required has fallen, ensuring Japan has the necessary skills

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Customer

Seiko Epson Corporation, commonly known as Epson, is one of the world's largest manufacturers of computer printers, and information and imaging related equipment. It is one of three core companies of the Seiko Group, a name traditionally known for manufacturing Seiko timepieces. Since its inception, Epson has passed down and expanded on its traditional strengths, refining its super-micro processing and precision processing technologies in the development of its watches and then expanding those technologies into other fields.

Products and services

- FUJITSU Virtual Product Simulator

Challenge

In order to reduce development costs and improve the quality of mass-production, Epson wanted the ability to study productivity before the detailed design process was implemented. This required a 3D virtual design aid simulator. Fujitsu Virtual Product Simulator (FJVPS) was supplied by Fujitsu in 2004. Since then, demand for the Virtual Product Simulator (VPS) has both grown and evolved due to a change in the lay-out of mass-production lines.

"Conventionally, it was the custom to dispatch several tens of engineers from the design department and production technology department every time mass production of a new model was started," explains Akifumi Takei, Section Manager, Equipment Production Technology Development Department, Epson. "Then, production would be executed, namely determination of the assembly order and recording in the assembly instruction sheet, as well as carrying out design of line layout, while staying at the site for several months."

The company's concern was that in dispatching large numbers of engineers abroad, it was weakening its own design capability in Japan. Epson's information imaging business division therefore decided to introduce a system of 'assembly evaluation' using FJVPS, which would reflect the design by modelling it in the processes up to the detailed end-product.

Solution

FJVPS is a technology platform which uses 3D-CAD data to inspect and review designs, improve productivity and prioritize the duties of production preparation. It helps Epson to decrease the frequency and unit number of trial production, while increasing the number of models that can be developed.

In order to achieve this, the company undertook the task of reviewing the entire commodification process. The manufacturing flow is defined as: Basic development (KS) → Conceptual design (TS) → Detailed design (WS) → (Technical transfer to an overseas affiliated company) → Mass-production design (ES) → Mass production (MP). In the case of printers, for example, a portion of the mass-production design would be executed in Japan, while the processes of mass-production design and subsequent processes were undertaken by three overseas affiliated companies located in Indonesia, China, and the Philippines.

"The 'study of assembly order and constitution' focused on the possibility of assembly and its procedure. In the 'assembly evaluation', sensory evaluation by workers can also be quantified, such as 'difficult to assemble', 'my arm hurts'," adds Minoru Kusunoki, Chief of Equipment Information, Epson. "Specifically, the system is configured to describe the work/operation along the assembly flow, and to input and tally the evaluation points of 'difficulty level of assembly' by each item."

In Japan, FJVPS is used for assembly evaluation, study/review of assembly order and constitution, study/review of jigs, and checking for interference. At overseas affiliated companies, assembly instruction sheets are prepared using the solution.

Benefit

FJVPS now enables Epson to reduce rework and the associated cost through the layout change of mass-production lines. It allows virtual verification such as the comparative investigation of plural layout plans by 3D display or the visualization of improvement status of line balance by means of stacked bar graphs.

"Japan is now able to precede with the review of line balance, which was conventionally only possible at overseas sites," continues Takei. "It will also be possible to shorten the necessary period for start-up by approximately three months while reducing the number of overseas engineers accordingly."

As a result, the efficiency of Epson's mass-production lines has improved by ten to twenty percent, compared with conventional manual design. This increases production capacity, in addition to reducing assembly time by around three to five minutes through the improvement of assembly properties.

The use of FJVPS has proven so successful that its proponents are proactively promoting its use beyond the imaging side of the business.

"In the long term, we want to make FJVPS the 'Master' of 3D manufacturing, by combining FJVPS and product data management," concludes Keiji Yamaoka, Section Manager, Equipment Information, Epson. "Sixty percent of the target was achieved by the realization of assembly evaluation and virtual verification of mass-production lines."

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