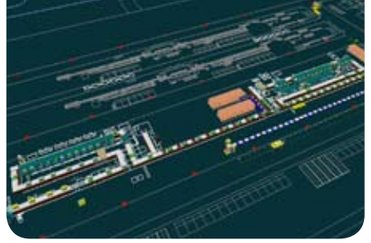
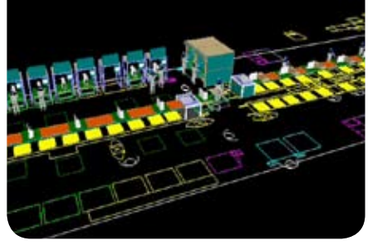
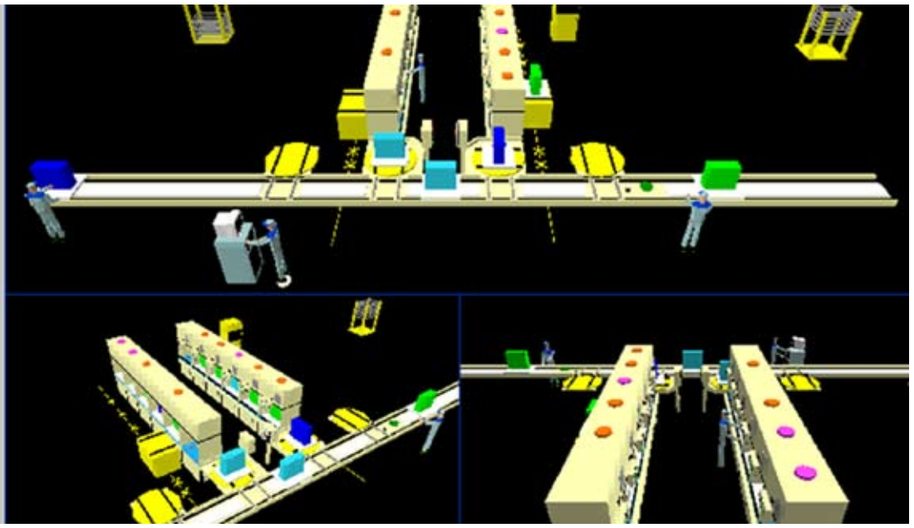




Production line design using simulation.



Changing workflow can improve the process capability with the same workforce.

Daikin Industries Improves Production Line Capacity by 30% with DELMIA

Solutions Help Prepare for Fluctuating Demand in Air Conditioning Market

AN INDUSTRY LEADER AND LONG-TIME USER OF DELMIA

Japan's Daikin Industries, Ltd. is a global leader in the commercial and industrial air conditioning systems market, with more than 40% of the market share in Japan and a well-established presence in China, Southeast Asia, Europe, and North America. The company is also one of the leaders in the fluorochemicals industry, with an approximately 20% share of the world market. They employ roughly 19,000 people and have manufacturing operations in 11 countries.

Daikin Industries has used Dassault Systèmes' 3D production line simulation solution DELMIA Quest for 10 years. DELMIA enables manufacturers to position the required elements for production facilities such as personnel, conveying systems, and materials, in a virtual space, then construct and validate virtual production lines. Simulating the production line in advance makes it possible to analyze equipment capacity, staffing, and buffer discrepancies between processes, quantitatively and visually, thereby shortening construction lead times.

EXPANSION OF AIR CONDITIONING SALES CHANNELS PROMPTS DEPLOYMENT OF DELMIA

In the 1990s, the company's share of the consumer air conditioning market was relatively small. In order to expand its business, the company extended the scope of its sales channels from construction companies to mass consumer electronics retailers, which generated much bigger sales volumes. On the manufacturing front, it needed to ensure increased flexibility to respond quickly to fast-evolving consumer demand.

"With mass consumer electronics retailers, it is unacceptable if there is nothing on the shelves when a heat wave arrives. We have to be ready. But at the same time, we need to build production lines that allow us to cut output quickly when it is a cool summer, while also maintaining productivity," said Komada. The DELMIA solution was deployed to build and enhance flexible production lines in both domestic and overseas plants.

ADJUSTMENT TO WORK PROCESSES ENHANCES EFFICIENCY BY 30%

Daikin Industries first used DELMIA Quest to optimize production lines at the company's Shiga plant. At the time, the lines were not operating at maximum capacity. First, Daikin Industries' engineers modeled and verified the existing lines. Next, they verified the locations of production line bottlenecks by varying parameters of production factors such as plans, allocation and workforce, work content, and equipment capacity.

"Interference can occur when automated equipment and humans come into contact with each other. Due to worker limitations, equipment can't always work at maximum capacity. The simulation in DELMIA Quest demonstrated that even if we increased the equipment capacity on this line, the capacity of the overall process wouldn't increase significantly," said Komada.

To improve this situation, 'what-if' scenarios were simulated and it was determined that if part of the work carried out previously by one worker was shared between workers in the process chain, significant improvements would result. Ultimately, the process capacity was improved by 30% with the same equipment and workforce simply by adjusting the distribution of work and making minor changes to pre-and post-processing.

DELMIA QUEST FOR START-UP OF OVERSEAS PLANTS

When launching its Czech Republic plant in 2003, Daikin Industries needed to have production lines up and running in an extremely short timeframe. With limited examination time, a simulation in DELMIA Quest was carried out on the minimum required resources—testing units and workforce—pre-allocated to the testing zone. Equipment was ordered only on this basis.

"Using a simulation to identify the essential resources for a process reduces design time of the model," said Komada. "By removing unnecessary resources virtually, we discovered that the simplified model was sufficient."

For the company's new China facility, a presentation of the new plant's appearance was made to management using 3D animation. "Thanks to DELMIA Quest, we were able to show management what the plant would look like using 3D animation. This was a very significant benefit," he concluded. ■

"Thanks to DELMIA Quest, we were able to show management what the plant would look like using 3D animation. This was a significant benefit," said Kunihisa Komada of Daikin Industries Air Conditioning Manufacturing Division, Production Engineering department.

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