



TOSHIBA

Case Study

Defining the precise digital twin of a fabrication line requires very advanced technology

When Iwate Toshiba, a semiconductor fabricator in northern Japan, started searching for a supply chain solution to resolve its myriad of production problems, it found exactly what it needed in Adexa's supply chain planning suite.

The Challenge

Based in Kitakami City, this high-tech giant faced the Herculean task each month of streamlining production of 25 million components to build 3,000 product lines, including microcomputer chips and CCD optical sensors for scanners. Its challenges were typical of the semiconductor industry: volatile demand, a highly complex product mix, short product life cycles, and long planning periods for production.

To resolve recurring production issues and improve customer responsiveness, Iwate Toshiba sought a supply chain solution that could do the following: quickly plan and schedule as many as 400,000 lots a day during peak production, provide accurate order commitments to customers, reduce the lengthy planning cycles for production, optimize its use of production resources, and achieve a more accurate supply chain model by integrating business planning with factory level scheduling.

Despite enormous complexities, Iwate Toshiba was still relying on production plans developed manually over eight hours at a time. As orders increased in number and complexity, however,



the planning process was unable to keep up, and the production plan itself could not respond to changing customer demand or absorb the impact of scheduling and execution changes on the factory floor.

Iwate Toshiba tried to switch from monthly to daily planning to improve customer responsiveness, but the complexity and magnitude of calculations required to satisfy the new demand taxed the company's resources to the limit. The old production model fell apart, and Iwate Toshiba suffered production setbacks that seriously impacted customer deliveries.



The Adexa Solution

In 1997, Iwate Toshiba selected Adexa's eGPS suite to improve the accuracy of its production planning and resolve recurring delays and inefficiencies, citing its superior speed, finite capacity planning, and accuracy in modeling inventory during demand planning.

eGPS's speed was immediately apparent, shrinking the time required to complete a four-month production plan by 50 percent from eight hours to four hours. Iwate Toshiba now runs production plans twice a day – once in the afternoon and again at night – dramatically improving its responsiveness to customer orders.

eGPS also helped Iwate Toshiba accurately model the use of its factory equipment. Historically, the company's master data had been flawed (e.g., a piece of equipment capable of producing only 20 pieces per day was recorded instead as "capable of 30 pieces per day").

With eGPS, actual production numbers on hundreds of pieces of equipment per line were fed to the master model to ensure greater data accuracy.

This process continues today as procedures are introduced, removed, or substituted to reflect new efficiencies, enabling eGPS to generate an accurate production plan at all times.

With the integrity of the production plan ensured, the company also turned to eGPS for reliable job sequencing on the factory floor. To keep production on track, eGPS generated a detailed operational plan that sequenced jobs across all plant resources, adjusting to unexpected events such as machine outages, inventory shortfalls, and labor shortages.

Finally, Iwate Toshiba leveraged eGPS's powerful planning algorithms to resolve tough scheduling conflicts. Through eGPS's flexible business rules, Iwate Toshiba created a prioritizing system to ensure no miss deliveries to high-priority customers, allowing production plans to be drafted by lots (instead of by individual products), while improving the accuracy of calculations.

The system also enabled the company to check actual produced quantities against pre-determined targets, dynamically re-allocate work-in-progress based on changing demand, and make adjustments to the production plan when necessary.



“Adexa is fast - this is number one,” Sugimoto said. “[We also liked] Adexa’s ability to perform detailed and precise capacity planning- something that our prior system could not do. By using the Adexa eGPS, our efficiency has improved dramatically.”

Tsuyoshi Sugimoto,
General Manager of
Toshiba’s Information
Systems



The Results

With eGPS, Iwate Toshiba transformed its supply chain and manufacturing processes for greater agility in meeting demand, thereby boosting responsiveness to customer orders.

To date, it has achieved a 30 percent increase in planning accuracy, reduced its inventory by 30 percent, increased production throughput and efficiency by 30 percent, and cut in half the time needed to generate a production plan. Iwate Toshiba expects these performance metrics to continue to climb.

