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A Case Study in Cycle Time Reduction

The experience of a machinery manufacturer that implemented a program of cycle time reduction (CTR) illustrates how eliminating lags in production can boost competitive advantage and profitability.

Before undertaking the CTR effort, the company's production cycle took 14 weeks from the initial order until shipment of the finished product to the customer. The lag forced the company to attempt to forecast demand three months into the future.

In other words, as it began the production cycle in May, it had to rely on its best guess on what customers might want in August. Not surprisingly, the crystal ball was a little cloudy this far into the future, creating a growing backlog of obsolete inventory.

Loss of Flexibility

In addition to inventory control problems that could be laid at the door of the long cycle time, the company lost the flexibility it needed to respond to new demand information that appeared halfway through the cycle.

Because its resources were tied up producing products that the company had seen a need for six or seven weeks in the past, it couldn't begin production to meet customer equipment needs as they emerged.

The CTR consulting team identified three problems that unnecessarily prolonged the company's cycle time:

- A "project build" assembly approach brought together all parts of the machine in a single operation that took eight weeks.
- Machine shop scheduling problems and large lot sizes produced a work pileup that contributed to a six-week timetable for parts production.
- A nickel-plating process for all key equipment components added two weeks to the machining operation.

In its solution, the team proposed specific action to address each problem.

Using Cells

The project build approach was replaced by a cellular approach, in which specialized mechanics built specific parts of each machine. Expertise developed in particular tasks of subassembly allowed increased speed.

The change to cell manufacturing cut assembly lead time in half, from eight weeks to four weeks. Total work hours spent in assembly dropped by 15 percent.

Improving Discipline

The machine shop switched to a disciplined scheduling system, based on a real-time dispatch list sorted according to the earliest date. Capacity-planning techniques helped prevent labor bottlenecks.

Cutting lot sizes to just-in-time levels helped in the effort to reduce manufacturing floor setup. As parts began to come through the machine shop faster, work-in-process was cut in half. The time required to produce parts was also halved, dropping from six to three weeks.

Adopting Design Changes

Part of the machining cycle time improvement came from product design changes to address the delay caused by nickel plating needed for machine parts. The manufacturing and engineering departments, in meetings with the CTR team, came up with a plan to eliminate the two-week off-site plating process.

Instead of using rolled steel to make machine parts, the company switched to stainless steel, which needs no plating. Not only did the change save time, but it also improved product performance at very little additional cost.

In total, cycle time was cut from 14 weeks to seven weeks, allowing the company to manufacture to order instead of being locked into a forecast. The cost of work-in-process was reduced by \$2 million, and obsolete inventory was virtually eliminated.



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