

Analytics



Analytics Delivers Needed Inkjet Production for Hewlett Packard

The Business

Hewlett Packard has been the world's leading brand in inkjet printers since the company introduced the first DeskJet product over a decade ago. However, by the mid-1990s inkjet printers had become so successful that HP and its competitors combined could not satisfy worldwide demand.

The Problem

Scaling up the existing, largely manual, production method was not HP's first choice:

- Pushing existing workers to produce more might lower quality and erode margins
- Hiring more workers would mean layoffs in the future as the inkjet market matured and demand leveled off – a violation of HP's stable workforce policy

HP chose to invest \$25 million in an automated system it expected would raise production to meet demand. But as the system came online, early tests showed that production would actually *fall* by almost half unless there was also a big increase in labor costs – the very outcome HP wanted to avoid.

The Existing Solution

The system HP was implementing consisted of stations and cells spaced at intervals along a conveyor loop. Cells build subassemblies and feed the conveyor. Once on the conveyor, the subassemblies go from station to station and are integrated with subassemblies built in other cells. The solution assumed 99% machine efficiencies and constant station cycle times.

Early data indicated machine efficiencies were closer to 97% than the needed 99%. In addition, station cycle times varied much more than expected. Another complication: the solution was already under construction. HP could not change individual machines, or any system component, without disrupting the system's development.

Analytics' Solution

Analytics' solution was to deploy buffers of in-process inventory at strategic points along the conveyor and within cells feeding the conveyor. Properly-sized buffers at these locations mitigated the effects of machine failures, yet did not expand inventory excessively. To identify buffer sizes and locations, Analytics adapted quantitative models from the "flow-line" research literature. By installing subassembly buffers that could hold 30 minutes of inventory, any disruptions in the cells were isolated from the main line. Another recommendation: to deploy buffers of about 12 units each one-quarter, one-half, and three-quarters around the loop.

The Analytics Difference

As an expert in the most advanced quantitative models, Analytics could selectively and appropriately modify and apply the models ideally suited to solving HP's problem.

Business Impact

Productivity increased \$280m

Analytics' recommendations cost HP \$1.4 million to implement. In return, HP realized an incremental revenue increase of \$280 million.

In addition, HP found itself well prepared for the day when inkjet prices were to drop and the focus would shift from revenue to cost control.

"Analytics' techniques helped HP achieve its production and revenue goals rapidly and cost effectively. In addition, the 50% increase in productivity we achieved through Analytics' work made HP's printers cost competitive far into the future."

–Supply Chain
Engineering Manager