

# THROUGHPUT ANALYSIS CASE STUDY

MARCH 2013

## Realistic Simulation Helps Close Output Gap for Crucial Component

Informed decisions boost productivity by 35%

### CHALLENGE

**Without changes, production would fail to match sales projections.**

With anticipated sales of 10,000 vehicles a day, a leading North American automaker had high hopes for a new manufacturing line in Tennessee, responsible for producing a core component. To prepare for production, engineers based their manufacturing simulations on two key assumptions: that the machines would behave like similar machines operating in the company's Ohio plant, and that sales projections, based on historical experience, should be adjusted down to 8,000 vehicles a day. But as the facility launch date approached, the sales department announced that it had previously underestimated its figures and that the true rate of sales would be closer to 12,000 a day. Without rapid changes in line design, the new module would not be able to meet demand, even with the addition of weekend overtime shifts.

### SOLUTION

**Base simulations on realistic data sets and test potential changes for improved output.**

Pinnacle Strategies became an integral part of a "blue ribbon" committee of manufacturing engineers, simulation engineers, and operations managers responsible for analyzing the current line design, determining its likely output, and recommending design changes for improved production. The Pinnacle consultant immediately encouraged adding a representative from the Ohio plant; his input proved critical. He recognized that the machines for the new line were more complicated than those in his facility, making the underlying data assumptions too optimistic. The adjusted simulation projected an output of just 13 jobs per hour (JPH), 35% below necessary production.

Further, the Pinnacle consultant saw flaws in the overall design; in its current configuration, the line was balanced with a standard cycle time applied across every machine, and buffers were minimal. As a result, if one machine failed, the entire line would stop. Pinnacle recommended a redesign with buffers that would absorb the impact of potential machine failures. Under Pinnacle's guidance, the team identified the bottleneck—the key piece of machinery that dictated the progress of all the others—and tested various cycle time scenarios on different segments of the line.

## CLIENT OVERVIEW

### REGION

North America

### INDUSTRY

Vehicle manufacturing

### CUSTOMER PROFILE

The customer is a global manufacturer that sells more than nine million vehicles in over 120 countries.

### BUSINESS SITUATION

False assumptions based on nonrealistic data sets and insufficient buffers threatened the output of a crucial vehicle component, risking lost sales.

### SOLUTION

An analysis using simulation, based on more realistic assumptions, led the cross functional team to an understanding of true machine capacity and gave them the objective tool by which they solve the capacity shortfall.

## RESULTS

EXPOSED ERRONEOUS DESIGN ASSUMPTIONS

INFORMED DECISION MAKING THAT AVOIDED SIGNIFICANT CAPITAL INVESTMENT

LED TO IMPROVEMENTS THAT INCREASED CAPACITY **35%**

## RESULTS

### **Production target will be obtained when revised engineering plan is implemented.**

By using the simulation as a means for testing buffers and cycle time variables, the design team was able to redesign the overall system so that output will increase from 13 to 18 JPH for each machine line—without adding new modules or new machines that would have increased capital costs.



#### **BEST PRACTICES SOLUTIONS**

Pinnacle Strategies is an international management consulting firm focused on operations management excellence. We work with organizations to increase shareholder value by developing high-performance business processes that significantly enhance productivity, reduce costs and time to market, improving profitability and accelerating sustainable growth. Pinnacle Strategies offers results-driven consulting solutions in the areas of performance management, project management, operations management, and supply chain.

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