



CASE  
STUDY

## Competitive Business Solutions

# Supermarket Enables Reliable Flow of Components to a Single-Piece Flow Assembly Cell

A CBS client manufactures extremely complex, high-tolerance products and operates in a very competitive market with high-delivery demands from its customers. The company was under severe cost pressures as profitability and cash flow were not meeting corporate expectations. Additionally, their backlog and their delinquencies were significantly increasing, such that the customer was considering offloading some or all the demand to a competitor. The company simply could not see a way to meet the growing demand. After a quick assessment, CBS realized the company did not have a “system” to synchronize the internal supply chain that would enable the 35 component parts to reliably flow from the punch press department to the assembly line. Moreover, the punch press department was outsourcing some of its own work, which in turn created additional risks due to the lack of synchronization.



### INDUSTRY

Industrial Manufacturing

### SOLUTION AREA

Supply Chain, Operational  
Excellence

## THE CHALLENGE

The client has a complex manufacturing process with limited production scheduling and inventory control systems. The supplying department was mostly reacting to daily reported stock outs. An expedite list was created from the shortages, which were then used to schedule production. Being a large punch press department, the unplanned daily expedites drove excessive setups. In fact, the department was consuming valuable production time by a factor of 2:1, thus spending more time setting up the machines than actually running them? Lastly, limited metrics were used to proactively manage the on-time delivery and “in compliance” levels of the 35-part inventory.

*“It was very difficult sitting in the daily production meeting and being reminded that you are the reason why the new single-piece flow cell wasn’t running as designed.”*

— Client’s Business Unit Leader

## THE APPROACH

### Understanding the Opportunity:

A CBS consultant spent a few days understanding the process in the punch press department and at the assembly line. This assessment revealed the troubling outsourcing and how the system needed to include the vendor in the solution. Having implemented many supermarkets, CBS quickly understood the issues and was able to formulate a solution that supported the needs of all departments. The key was to “enable flow,” a fundamental principle in the system synchronization of a lean enterprise. We used CBS’s supermarket modeling solution to build a planning tool by following these steps:

- 1) Recognize the assembly department’s daily demand.
- 2) Understand the lead time to make the component parts in the punch press. (This is a capacity-planning and supermarket-sizing issue.)
- 3) Calculate an inventory minimum and maximum on-hand balance.
- 4) Implement sustainment tools to manage the inventory levels, performance to design, and material flow.

### Deployment of the Solution:

Within a few weeks, the supermarket solution was implemented by following the steps above. CBS and the client:

- 1) Deployed a supermarket-modeling tool based on demand and lead time, so the client could manage the designed level for each part.

- 2) Built the physical supermarket where the designed/optimized inventory levels for the 35 parts would be located.
- 3) Implemented and trained workers to use a scheduling system and a visual board for the key punch presses that produce the parts.
- 4) Created a visual board to manage the inbound flow of the 16 parts that were contracted to the outside vendor.

In addition to employing the visual planning and management tools on the floor, CBS utilized an Excel-based supermarket planning mechanism to manage the designed inventory levels. To put it simply, CBS aligned the daily demand to the perpetual inventory balances, so when we hit the minimum inventory level, it indicated the need to produce that particular part. The production quantity was also calculated by the tool as it was an amount based on the demand during the lead-time period.

Once the solution was deployed, CBS needed to transition the system to the client, so they would be able to sustain it. To enable this, detailed standard work was developed and used to train the client. The client learned by:

- 1) Understanding the steps in the process.
- 2) Seeing how to perform the steps.
- 3) Doing the steps in the process and repeating them till mastery.

Then, we audited the process for several cycles until both the client and CBS were comfortable that they were ready to run the system on their own.

A final step was to create KPI's to manage the effectiveness of the system. Five key metrics were implemented, namely:

- 1) Number of assembly line stockouts.
- 2) Number of supermarket stockouts.
- 3) Inventory turns.
- 4) Performance to the punch press schedule serving the supermarket.
- 5) Performance of the outside vendor serving the punch press.

### The Results:

*“We used to have full carts sitting everywhere, but we still didn’t have the parts we needed. Now we have empty carts sitting here, and when we get our pull signal to produce a part, we have the capacity and the carts to fill the demand.”*

**— Client’s Business Unit Leader**



### STATISTICAL RESULTS

- Within two weeks, CBS was able to sustain zero-stock out's at both the assembly flow line and punch press supermarket.
- Inventory turns improved by over 50% within one month. (Though not the primary focus of the solution, a supermarket will naturally “right-size” the inventory levels based on lead time to produce.)
- The outside vendor was able to stay apace with the punch press, eliminating significant production disruptions.
- Throughput at the assembly line improved 20% because of the more reliable supply of parts from the supermarket.

### CONCLUSION

The solution that was developed and deployed using CBS's supermarket model enabled the client to quickly realize the intended benefit of increased volumes through the assembly department. Had the supermarket system not been put in place, the hard work of the assembly flow line would have been lost, and the flow would have been disrupted due to parts shortages. Understanding the entire supply chain was required so that a successful solution could be mapped and implemented. The system is now aligned to the “Takt, Flow, Pull strategy” of a single-piece flow line.

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