CASE STUDY

Packaging Manufacturer Improves Productivity

High Volume, Low Margin Operation Saves Almost $1 Million with a 30% Improvement in Productivity in Just Over Six Months

Client
A high-mix, high-volume manufacturer and distributor of food service disposables and food packaging.

Challenge
Make financially significant productivity improvements in a high-volume, automated production operation.

Solution
Over six months and three phases, TBM helped our client analyze current processes and identify potential productivity savings, then plan and rollout a variety of labor allocation and process changes.

Results
Total production positions were reduced from 27 to 19 per shift, a 29.6% reduction, which equates to almost $1 million in annual productivity savings.

Business leaders tend to be too conservative when it comes to setting operational improvement goals. They're too conservative in their estimation of what's possible and too shortsighted when considering what's necessary to maintain their margins and competitive position. Take an annual productivity improvement goal of 2-3% as an example. That's a fairly typical target but in most markets it's not enough to keep up with inflation (hourly labor and benefits cost increases).

There are many opportunities to drive substantial productivity improvements if business managers understand what's possible, and then go after it in a deliberate way. In this case study we describe the 30% productivity gains that we helped a client realize over 6 months in a highly automated, high volume manufacturing operation, and explain in detail how those gains were achieved.

30 Units per Second Leaves Little Margin for Error

The facility's 11 highly automated production lines, each roughly 100 feet long, make thermoformed food packaging products. The plastic resin is siphoned into the plant from outside siloes, melted and formed into a thin sheet 40- to 60-inches wide, which is then vacuum-formed over a mold. Next, the product is cooled, trimmed to its final shape and stacked. Each line has an output capacity as high as 30 units per second.

The plant runs 24 hours a day, seven days a week, over four shifts. Company leaders considered the operation fairly efficient, and the business as a whole was profitable. There wasn't an immediate crisis or "burning platform" that triggered TBM's engagement. But this is an

extremely competitive business segment and they're always looking for ways to improve efficiency. The new site leader knew there was some untapped potential for improvement and needed help uncovering it.

When we began our work the site employed 236 people, with 108 in the production areas (27 people per shift). Over the course of six months, from mid-May through mid-October, we helped reduce the number of production positions by almost 30% to 76 (19 per shift) without any new automation or other major capital investments.

It should be noted that no one lost their job because of the improvement work, which was important from a cultural perspective both when implementing the process changes and maintaining them. Normal attrition enabled the labor reductions and cost savings benefits to be realized almost immediately.

Assessing the Work Content

Streamlining production steps and utilizing existing people more effectively is a key element of any productivity improvement effort. When we started each production line had one operator. Loaders covered one or two lines, readying the product for final packaging; most of these people were temporary employees. Two floaters moved around the production area as needed. (See figure 1 on next page.)

During the first phase of the project, we watched the work being done and talked with employees. This was followed by more careful time and task observations. Subsequent analysis revealed what we suspected from our initial observations. The actual value-adding time of the loaders was less than 50%, which meant that they could each realistically cover three to four lines instead of just two. In total, by resizing and rebalancing the lines, we identified potential annual labor savings of just under $1 million.

Identifying such opportunities on paper is only the first step. Realizing the potential gain required a detailed process redesign that compensated for the differences between each line and a gradual introduction of the changes. The physical changes included extending the end-of-line conveyors to expand the finished goods buffers, which reduced loader waiting and walking time. We also helped set up an andon system* for material replenishment, painted color-coded parking spots on the back of the lines, and removed all dunnage from the end of the lines.

Instruction Sheets and Other Documentation Help Sustain Gains

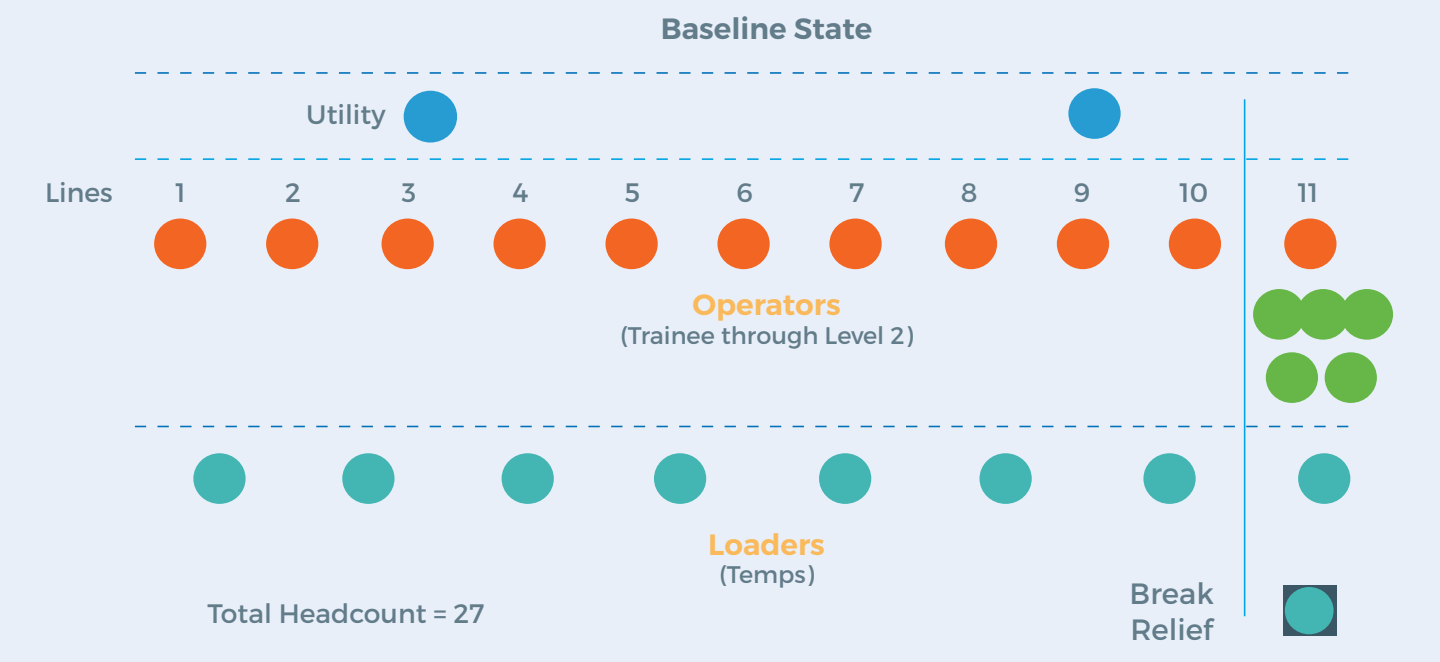
The standard work instruction sheets for operators and floaters follow a checklist format, starting with the review of machine settings, process parameters and performance of routine maintenance tasks. Today, operators record any issues that pop up and turn in the sheets to their supervisors at the end of each shift.

Other documentation that we helped develop was designed to reinforce the more rigorous daily management system. This includes a detailed load balance and utilization playbook, safety/quality/ delivery/ cost (SQDC) tracking sheets, and 5S audit sheets. The use of this documentation a tools is supported by MDI (managing for daily improvement) training, which TBM introduced to all supervisors and the more senior operators.

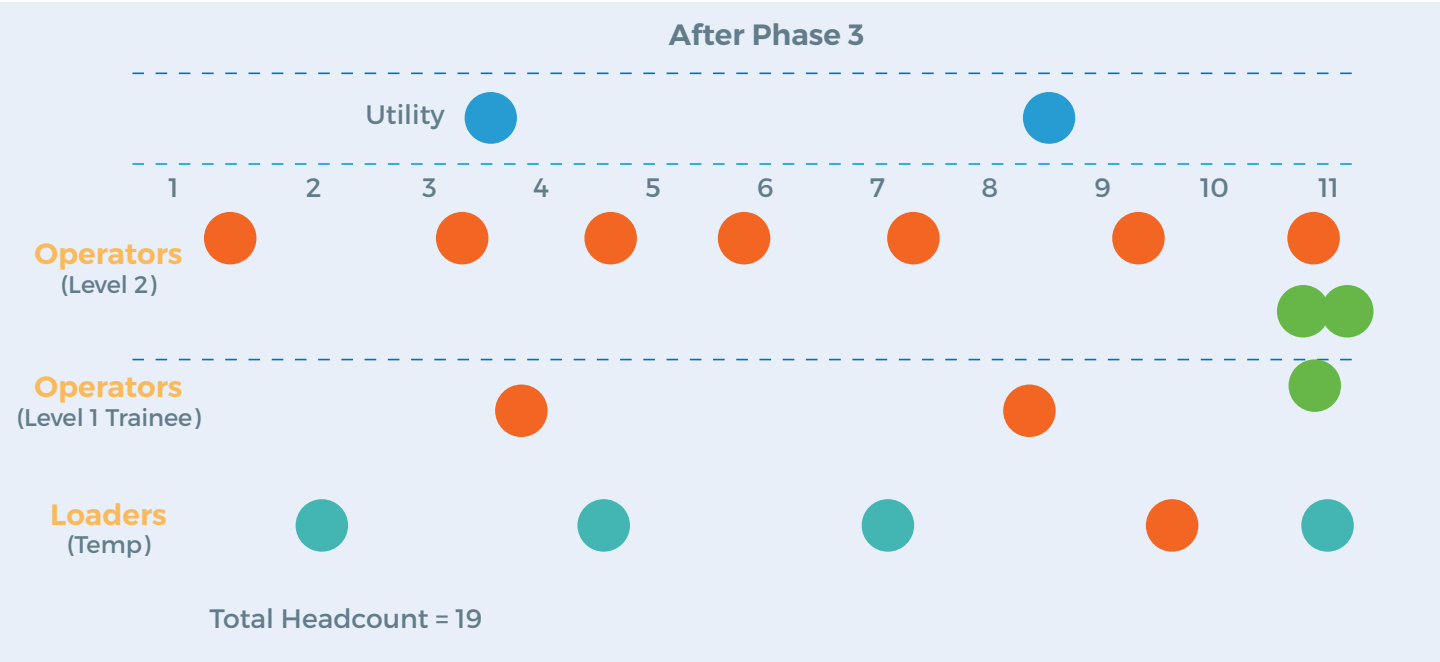
**Often incorporating signal lights at each workstation, an andon system notifies supervisors, maintenance, and other workers of a quality or process problem so that it can be addressed immediately.*

Figure 1

Productivity Gains: Before and After



In the baseline state, operators (trainees through level 2) supported one line from end to end. (Line 11 requires extra loading and packaging support.)



After phase 3 of the transition, higher level operators oversee the extrusion through trimming processes on multiple lines. Lower level operators monitor automation and support loaders.

** On paper a labor reduction like this can seem simple and straightforward. In this example successfully making such a transition required a clear understanding of where the savings opportunities were and deeply engaged site leadership.*

For some employees the changes to their workday routines was fairly dramatic. The new standard work instruction sheets provide detailed job guidance with reduced idle time that maintains a manageable work pace. The time allocations noted in these instructions are based on a "worst case scenario," when production rates are at their absolute peak. They include the responsibilities of support personnel and job rotation guidelines to give relief to employees working on the busier lines.

Leading by Example

Through each of the three transition phases, the plant operations leader worked side-by-side with supervisors to introduce the changes to employees. Even though he has over 30 years of operational leadership experience, including lean manufacturing rollouts at other companies, to demonstrate his support he participated in all of the training. The progress we made would not have happened without his deep engagement.

Of course, making productivity improvements that cannot be maintained is a waste of time and effort. The documentation and training sessions helped sustain the new processes and performance levels. Other deliberate management actions that have helped maintain the productivity gains include standard work audits, continuing coaching, operator development plans (to maintain competencies across all shifts) and an ongoing leadership presence on the plant floor.

This project demonstrates the productivity improvement potential that we helped our client capture and maintain over the course of six months. In addition to TBM's support, it required significant management effort to lead the people on the plant floor through the changes. The 30% productivity improvement and subsequent labor cost reductions easily justified the investment.

Productivity Improvement Success Factors

1. Leadership dissatisfaction with incremental 2–3% annual productivity gains.
2. Detailed analysis of current labor content.
3. A clear future state target and planned transition.
4. Standard work instruction sheets documenting job responsibilities.
5. Absorb labor requirement reductions and capture savings through attrition.
6. Standard work audits, coaching and employee development plans.
7. Adoption of a rigorous daily management and improvement system.
8. Leadership engagement and presence throughout the implementation of changes.

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