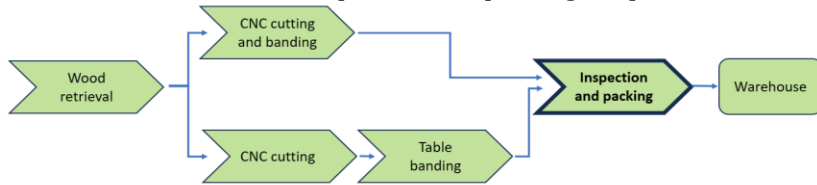


Improving Table-Pack Work Cell System Efficiency using Intrinsic Motivation and Lean Manufacturing Principles

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Industry Partner: Richard Davidson - Chief Executive Officer, Co-Owner
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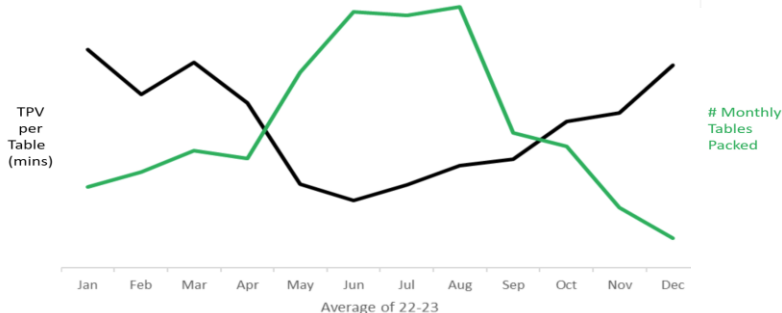
Marco and Table Pack

Marco Group, Inc. is a manufacturer of made-to-order classroom furniture and storage solutions in Neosho, MO. Each one of Marco's table shapes are customizable, leading to over 45k combinations. Tabletops are built in-house using cellular manufacturing. Table-Pack is the last work cell before shipping and is where the final inspection and packing are performed.



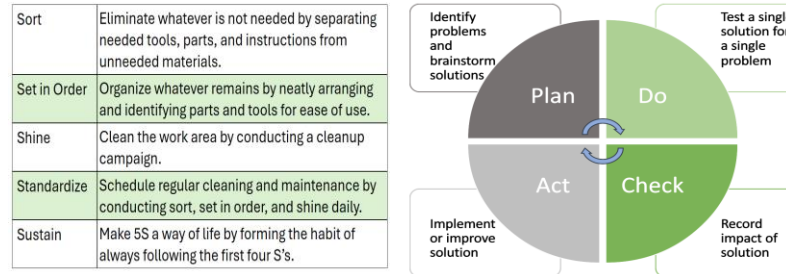
Seasonal Inefficiencies

Marco's demand peaks during the summer which highlights the efficiency problems in Table-Pack due to an increased workload. This leads to a bottleneck in the facility. However, in the slow season, Table-Pack slows their labor rate due to Parkinson's law, which states that labor expands to fill the time available for completion. This causes Table-Pack to run significantly slower when there is less demand, which wastes labor.



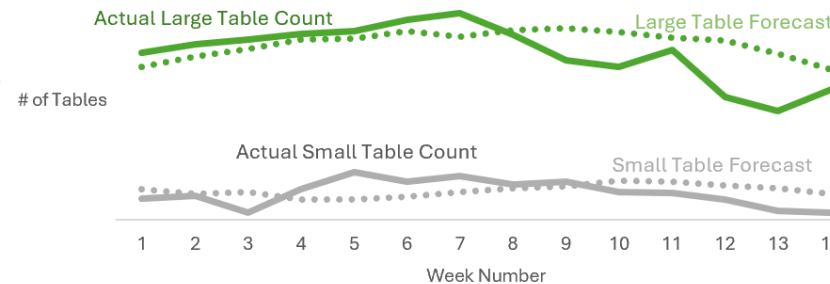
SOP's and Lean Techniques

We defined a set of Standard Operating Procedures for Table-Pack and added a framework on how to use the 5S cycle in the work cell to improve the cell's organization. PDCA methodology was also added to instill a continuous improvement culture led by operators. These recommendations reduce wasted labor and motivate operators to take ownership of their work.



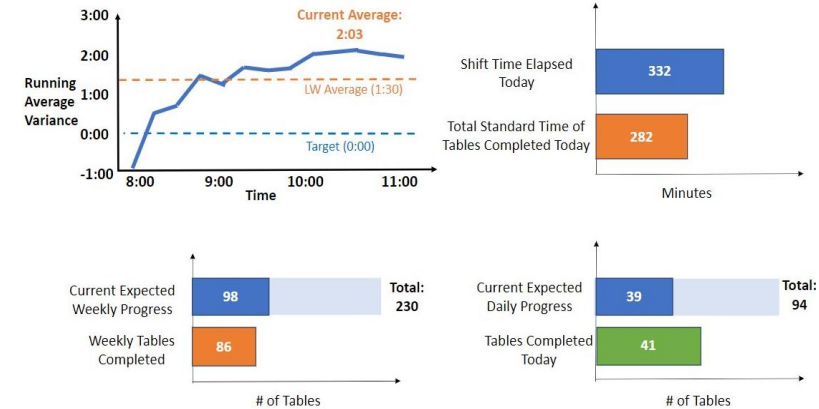
Product Mix Predictions

To give management a heads-up on their future workload, we created a moving average prediction of demand. These predictions were split into different categories: bulk vs single-packaged tables, and large vs small tables. These categories directly impact the labor required in the cell and can be used to plan for the labor in Table-Pack during the coming weeks.



Operator Dashboard

We designed a dashboard for operators to see, containing production goals and progress monitoring for Table-Pack. This will instill intrinsic motivation and establish goal-oriented work for the operators. Operators will be able to monitor performance and productivity measures.



We created a visual mockup of the dashboard, shown above, and outlined where data should be sourced and what purpose each measure serves. Then, we handed off our work to Marco's developer to implement our design in their software system.

Anticipated Impact

Based on our research, we estimate that by diminishing the impact of Parkinson's law, Marco can expect to save between 748 and 1055 labor hours annually. We anticipate this impact will be greater when factoring in the labor improvements detailed in our SOPs.