Objective
Demonstrate the savings and benefits of automating the center seam sewing process on the sling-back cushion line for Arden Companies

Steps to success:
1. Understand the overall cushion manufacturing process
2. Understand the quality and operational effectiveness of the current line
3. Understand the economic impact of replacing the sew across process with an automated machine
4. Developing process improvement recommendations

Motivation
The current sew across automation process is especially work-intensive for the highly skilled labor assigned to push the cushions through the sewing machine. Since this process requires the operators to manually hold the cushion closed and push the cushion through the machine, there is a high likelihood of fatigue and injury associated with repetitive tasks. The Arden team’s goal is to recommend an alternative process to the current manual task in order to alleviate the strain experienced by the sew-across operators who can then be reassigned to different functions on the floor. Globally, this can impact other sew processes by providing an example of a solution to highly repetitive work in order to reduce ergonomic strain.

Method
The project was divided into two sections: the economic analysis of other options, and the technical work to improve the Hon-Yu sew across machine.

Economic Analysis
Goal: Evaluate each alternative to the current sew across process method, and provide Arden with the information needed to make a educated decision on which process would best suit them.

Improvement on the Hon-Yu
Goal: Gain access to the programmable logic controller, and improve the overall efficiency of the machine. In addition, consider the cost of all modifications needed to improve the Hon-Yu for the economic analysis.

Results

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<tbody>
<tr>
<td>Cost of one machine</td>
<td>$0</td>
<td>$87,105</td>
<td>$106,485</td>
<td>$366,219</td>
<td>$97,500</td>
</tr>
<tr>
<td>Payback Period (years)</td>
<td>0.00</td>
<td>0.26</td>
<td>0.32</td>
<td>0.81</td>
<td>0.25</td>
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<tr>
<td>Net Present Value of Project</td>
<td>$10,594,168</td>
<td>$10,722,356</td>
<td>$10,617,308</td>
<td>$13,298,782</td>
<td>$12,961,414</td>
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We are presenting the company with a wiring diagram of the PLC, a Hon Yu machine logic flow map, an economic analysis tool, and recommendations for the future in hopes that they continue this project with these items in their toolbox. The next steps in the project will be to either continue work on the Hon Yu workstation by consulting with automation experts to fix the machine or to purchase new machines. The economic analysis tool can be used by Arden engineers and accountants to confirm each project’s worth and proceed with an informed decision. Our recommendation for Arden is to proceed with replacing the manual sew-across lines with fully automated Styrteknik machines in order to relieve the most stressful floor position, improve quality, and save money long term.

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