

# Sanding Automation

## Eliminating Production Bottleneck

### Challenge

Perpetual Enterprises is a contract metal fabricator and institutional furniture manufacturer located in Coraopolis, Pennsylvania. They offer a wide range of custom capabilities, as well as standard product offerings such as tables, storage towers, free standing desks, workstations, open shelving, and seating. Their custom capabilities include manual processing as required by a given job. When the volume of a particular customer part family increased to the level that the required sanding of parts required 2 full time operators including overtime and weekends, management knew there had to be a better way. Additionally, completing the repetitive motion required by the manual sanding task daily took a big physical toll on the operators. Assigning more of their limited staff, including management, to the manual random orbital sanding task was simply not sustainable.

### Approach

Upon hearing of the newly released Build Back Better award for Southwest Pennsylvania and Catalyst Connection's Digital Bridge program focused on supporting manufacturers with technology adoption, Ken Hoff, President of Perpetual Enterprises, was immediately interested. "We were already engaged with Catalyst Connection on an ERP implementation project, so it was an easy call to make to explore a program that could help address our sanding bottleneck. The potential funding was a big draw as well", Hoff recalled.



*"Catalyst was instrumental in helping us bring this project to fruition. The expertise and focus they brought to the table were a big asset to the team and gave us confidence in continued project progress even when our attention was pulled in other directions. I only wish we did this sooner!"*

**Ken Hoff, President,  
Perpetual Enterprises**



Perpetual and Catalyst Connection embarked on a System Integrator Selection Assistance project that provided end-to-end support:

- Validate technology opportunities & estimated impact to Perpetual Enterprises
- Define manufacturing requirements target application & develop RFP (Request for Proposal) documentation
- Research to identify suitable providers in region and beyond
- Manage RFP process on behalf of Perpetual to obtain multiple qualified proposals
- Support proposal review and decision process

After coordination of site visits and subsequent communications and proposal reviews, three proposals were delivered to Perpetual, with the final decision coming down to two competing options. Once the final proposal decision was made by Perpetual, Catalyst continued to provide project management support through the final implementation of the solution. Catalyst's role throughout is to be an advocate for the client to drive collaboration with the 3rd party provider and ensure the client receives the best solution for their challenge.

Throughout the entire project, Catalyst Connection was positioning the project to maximize the capital assistance Perpetual would receive from the Digital Bridge program. They were able to receive funding for both the preliminary development and validation of the cell and the final implementation of the system.

Perpetual Enterprises is a prime example of the challenge many small and medium manufacturers (SMMs) face when considering technology – their most limited resource is time. In fact, Tim Hoff, Perpetual Enterprises Production and Technical Manager, has previously designed and deployed integrated robotics systems at their shop, but did not have the bandwidth for this project. The partnership with Catalyst Connection allowed Perpetual to expand their bandwidth and accomplish their goal.

## Solution

Perpetual Enterprises selected a proposal from Premier Automation in Monroeville, Pennsylvania due to a combination of technical approach, provision of substantial upfront validation, and geographic proximity. The solution consists of an enclosed automated sanding cell mounted on a machine base with fork pockets to allow for easy relocation within the facility as needed. There are two infeed drawers that allow easy operator loading and unloading while maintaining continuous sanding operation.

The system is built around a Fanuc LR-10iA/10 6-axis industrial robot, a PushCorp AFD310 active compliance device and SM0605 spindle, along with a custom end effector for handling all target parts. The infeed drawers also feature easy change part fixtures to accommodate all sizes in the part family.

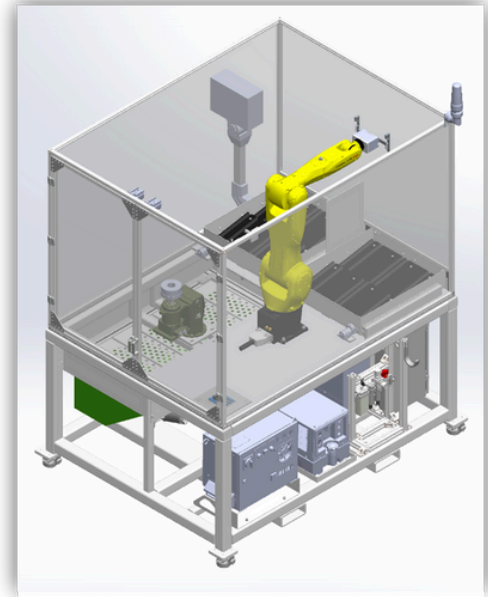


Figure 1. Sanding cell is self-contained and easily movable

## Outcome

Figure 2. Cell implemented in Perpetual Enterprises shop  
The automated sanding cell went into full production on October 27, 2023, and has processed over 23,000 parts to date. The manual process previously required 2 operators on a full + overtime basis. The automated cell requires 1 operator to load/unload the cell and increases throughput by 20% or more, processing between 6000-7500 parts in a standard 5-day, 8-hour shift week. The 2nd operator is now able to shift to another task, further increasing the impact of the automated cell. The qualitative benefit of the cell is even more pronounced, by eliminating overtime and weekend work to keep up with production demand. "We now have the pleasure of wondering about our weekend plans", Hoff said with a smile.

Perpetual Enterprises is well positioned should production demand increase further, as automated load/unload of the cell is within reach. Further, the relationship developed with Premier Automation has facilitated exploration of other tasks ripe for automation.



Figure 2. Cell implemented in Perpetual Enterprises shop



The Digital Bridge program was able to **offset Perpetual Enterprises' cost of implementation by \$35,000**: \$10,000 for the **initial validation and engineering** project and \$25,000 for the **final cell implementation**.

Contrary to the common narrative that automation eliminates jobs, the workforce acceptance of the new cell has been very positive, even developing a friendly competition with keeping the robot fed with material. Metal fabricator Rob Kurtiak says, "The object is – just don't let the robot win!" It is common that team members often take to naming robots and for Perpetual, some options in the running are Robo, Buffy, and Jimmy Buffett. However, Kurtiak says he can't speak enough about the quality of work improvement that has resulted and comments, "we just call it 'our solution.'"

