

How Automation Can Be Used as an Employee Development Platform and Cost-Saving Tool in the New “Difficult-To-Hire-And-Retain” World

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Introduction

The current business landscape is highly competitive, and organizations are struggling to hire and retain employees with the right skills and attitude.

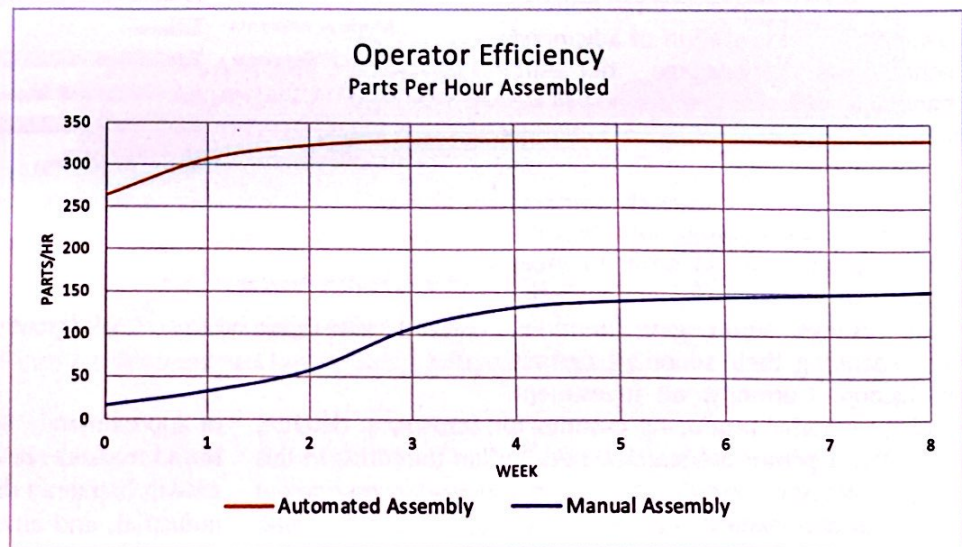
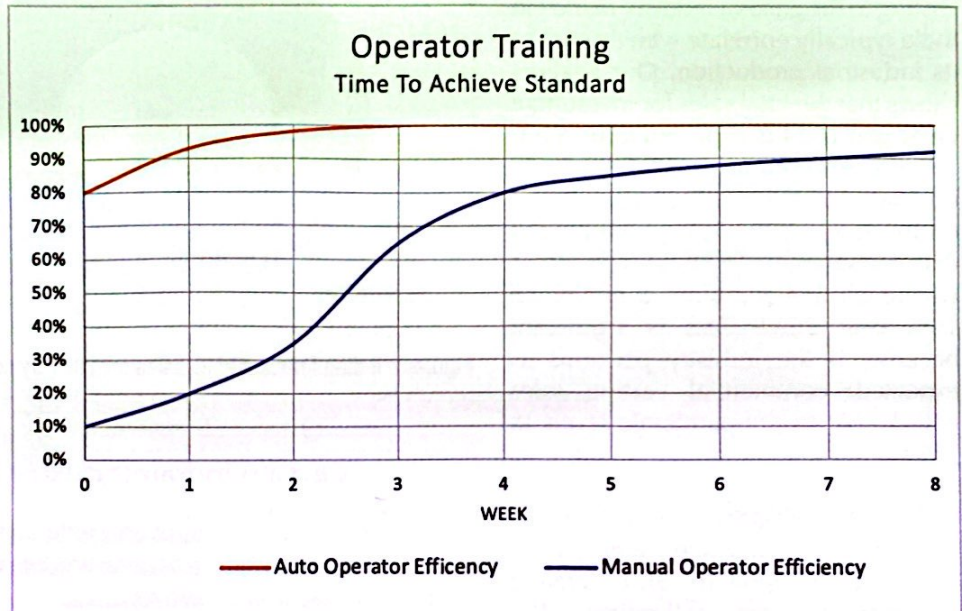
At MPI, we have experienced similar challenges finding talented individuals who have the aptitude to learn the skills required for our wax room pattern injection and pattern assembly business.

Historically, the wax room has been considered a low-pay training-intensive department, making it challenging to retain employees who are satisfied doing these tasks as a career. Training to make manual assemblies used to take 3-6 months to produce high quality, repeatable assemblies. Along the way there were high scrap rates and lost opportunities. Through automation, however, we were able to transform this department into a lower-skill entry-level high-value-added position, attracting employees who are enticed by working with technology.

Benefits of Automation as an Employee Development Platform

- I. Increased engagement and evaluation
- II. Reduction in Cost and Time
- III. Creation of a Career Growth Path
- IV. Increased Standards for Hiring

1. Increased engagement and evaluation: We have observed our entry level employees are able to add value on day one, which increases their engagement from the outset. We can train them and develop them on company culture and values while evaluating them



for aptitude and attitude, providing a clear growth path for them to develop a career at our company. Automation allows us to build up an employee’s confidence and bring out a higher potential than was

evident previously through higher engagement and morale.

Manual Progression Towards Productivity

i. Week 1: will be the start of

Assembly	Part Per Assembly	Weld Per Min	Assembly Time (min)	Assembly per hr.	Cost	Savings/ Assembly	Savings/ Part
A Man	15	3	6	10.00	\$5.93		
A Auto	15	6	3.5	17.14	\$3.57	\$2.36	\$0.16
B Man	30	3	11	5.45	\$10.35		
B Auto	30	6	6	10.00	\$5.68	\$4.67	\$0.16
C Man	60	3	21	2.86	\$19.16		
C Auto	60	6	11	5.45	\$9.89	\$9.27	\$0.15
D Man	120	3	41	1.46	\$36.92		
D Auto	120	6	21	2.86	\$18.27	\$18.65	\$0.16

production work. Everything will need to be checked over. They will be working slowly and methodically to ensure quality. Assemblies will take 3-5x longer than the standard.

- ii. Week 2-3: is the inflection point. This is where it will be apparent whether an operator has the ability to consistently weld patterns. At this point 80 to 120hr.'s have been invested in training the operator. If they are capable of welding, they should be getting faster, and assembly times will be ~60-70% of the standard. Work should still be verified by another operator.
- iii. Week 4: An operator should be able to assemble without another operator verifying their work. They should be able to make defect free assemblies at about 85% of the standard time.
- iv. Week 4+: The operator will be getting faster at assembly, working closer towards standard times. It may take another 4-6 weeks for the operator to assemble at ~100% of the standard time. Some operators may never be able to hit the standard.

Automated Progression Towards Productivity:

- i. Week 1: The operator should be able to run quality assemblies on

the machine in under an hour of training. Their training will continue as they run quality product. They know how to startup and operate the machine to run existing recipes.

- ii. Week 2: It should be apparent by this point whether the operator is a good fit for the type of work they will be doing. They will continue to have questions but should be running the machine at or near the standard operator time.
- iii. Week 3: The operator should have a solid understanding of the process and what goes into making a quality assembly. They should be capable of pattern and assembly quality inspection.

- By moving to automation, MPI has recognized a ~200% potential increase over a fully trained operator.
- At MPI we are able to capitalize on an increase in capacity of over ~500% in the first 3 weeks of operator training.
 - o This allows us to engage with our team in more creative ways and focus on personal development.
- MPI's intuitive operator interface has become the primary training aid, drastically reducing the effort and cost of job set up and change over.

2. Reduction in Cost and Time: Automation has reduced the time and

cost to evaluate a new employee for aptitude, attitude and fit within our company culture. Our onboarding process now starts in the wax room, where a new employee is making perfect wax assemblies and outperforming the most talented manual assembly people.

a. Furthermore, we have seen an immediate reduction in scrap rates, increased profit margins and decreased lead time.

i. Operator efficiency parts/hr. is based on 3/min (man) and 6/min (auto) over 55 minutes/hour. This is to account for assembly change over. For manual assembly this is much better than any operator will achieve.

b. Lower cost results in higher profit margins when comparing work produced via automation versus manual.

See **Table 1** above.

- An increase of 2X throughput
- A decrease of nearly 50% of cost
- A significant increase in profitability
- Increased ability to win new orders and bid more competitively.

Estimates were made using the following assumptions:

- Manual Assembly 3 Weld/Min
- Auto Assembly 6 Weld/Min
- 1 Min/Assembly changeover time for both
- 5% Scrap on manual Assembly

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3. Creation of a Career Growth Path:

Automation has enabled us to provide a growth path that previously did not exist, allowing our employees to be productive and trained for other value-added processes within the wax department and other departments within the company. Year to Date, we have hired four new employees to work on the automation equipment in our wax room. Two of them have already transitioned into entry-level machine technicians.

4. Increased Standards for Hiring:

Because of automation, we have increased our standards for who we will hire, replacing warm bodies with driven talent. This approach has enabled us to attract employees who are enticed by technology but do not have the background or job history that allows them a hands-on technical career.

Benefits of Automation in the Wax Room

We have as a part of our business a

Technology Center where we support our customers with pattern injection, pattern assembly, and process development. We specialize in duplicating our customers' processes with their materials and their work instructions. We then collaborate with them to automate these processes. Most of the customers we work with are job shops who have low volume short run production. We saw an opportunity to take our knowledge of automation and develop an assembly solution with a 5-assembly break even when compared to manual assembly.

We collaborated with several customers using their real parts and production requirements and realized the following benefits:

1. Dramatically reduced one-time tooling costs from over \$15,000 to under \$500 when compared to traditional automated pattern assembly. This is a 98% reduction!
2. Less than one hour to set up and begin production of a brand-new part number.
3. The process lives in the machine, not in the operator, or the process

engineer.

4. On-the-fly adjustments to the standards, such as adjusting spacing, number of parts on a runner bar, and orientation with no robot programming.
5. User friendly controls for set up and operation with no robot training necessary.
6. Training a new operator to run the new job in about 10 minutes.
7. In about two hours, a new operator can be taught how to set up a new job recipe.

Conclusion

Automation can have a positive impact as an employee development platform in the new "difficult-to-hire-and-retain" world we now live in. Through automation, the employee onboarding process can be transformed, reducing recruiting dollars and efforts, training dollars and hours, retention dollars and efforts all while increasing profits, customer satisfaction, competitiveness and reducing lost business opportunities.



Looking for New Talent?

The Investment Casting Institute's website features students looking for Full Time and Intern Opportunities.

www.investmentcasting.org

