



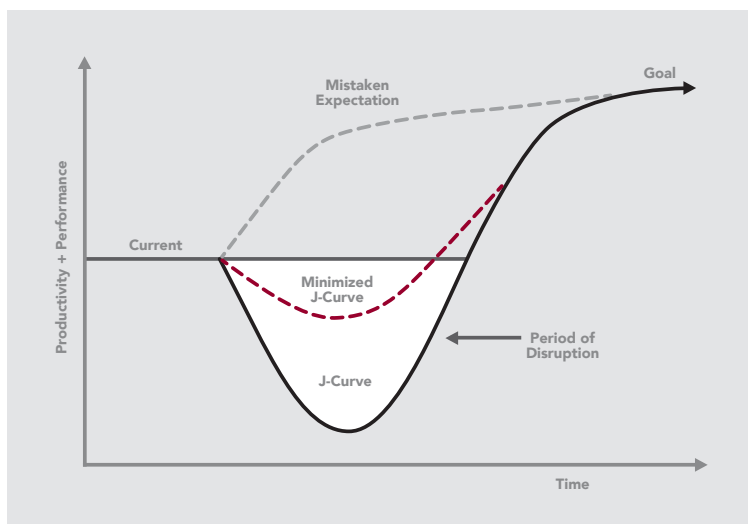
**A STRONGER  
STANDARD**

# MINIMIZE THE J-CURVE EFFECT IN MANUFACTURING



You may have heard the term “J-Curve” from the world of investing, but it’s a concept that applies to anything – even manufacturing.

The J-Curve explains the often mistaken expectations to the more common initial negative effects of implementing new technology or processes before it eventually leads to increased productivity, efficiency, and profitability. The concept is named after the letter “J,” as the curve typically dips down initially before rising sharply.



It’s useful to demonstrate the effects of an action over a period of time. Put bluntly, it shows that change will make things temporarily worse before they get better, which is completely normal and expected.

But as the saying goes, “No pain, no gain.” This article will explain the impacts of the J-Curve effect and provide tips on how to make this initial phase of decline much softer so you can get to the benefits phase quicker.



## The J-Curve in manufacturing.

Any time you make a process or technology change in manufacturing, you'll most likely experience a gap in expectation on your journey from your current state to your desired state. This gap is the J-Curve effect. It happens because this new variable will affect other things. At DeGeest, we experienced the J-Curve when we added our first welding robot.

After making initial weld programs and starting production, we found ourselves reworking many parts. In this case, the painful variable was adjusting our company-wide processes from the adaptability of a manual welder to the precision and repeatability required for a robotic welder. We had to increase the quality of our fabrication processes, improve our fixtures, review tack procedures, and tighten up our tolerances.

Tackling these variables one at a time initially decreased our production. It would have been faster and easier to scrap this new robotic welding machine along with the required new processes and go back to our old manual methods. Instead, we fought through the J-Curve and are now running fully automated robotic welding jobs and producing more parts more efficiently than ever before.

Another example is the addition of Lesta robots to the paint line at DeGeest. Adding the adaptable self-learning automation was great in theory, but there weren't quality and consistency checks and balances in place to make it a smooth transition. After experiencing another decline in production, we resisted the temptation to go back to manual finishing. Instead, we came together and worked on identifying variables that affected our new automation and created processes and programs to take advantage of this new technology.

While it's true that adding a Lesta robot will result in Day One Finishing (meaning you will be finishing robotically the first day after installation), it's important to be realistic about initial production goals due to the adaptation required for new technology, also known as the J-Curve. Higher efficiency will come over time. Remember, Rome wasn't built in a day.



## Stay strong and good things will come.

If you add new technology or automation to your facility, there will be plenty of excitement at the beginning. But as process norms begin to get strained, you WILL go through the J-Curve's period of disruption. As previous norms are challenged and performance is temporarily impacted, people will have a tendency to become nonbelievers and be tempted to back out.

Once you push through this phase, you'll enter into the J-Curve's tangible benefits phase where things start to work as planned. Efficiencies will improve. Morale will go up. And production (and profits) will soar. The thing to remember is that you're not the only one to experience this dip when implementing change. People are often too proud to talk about it or try to forget.

## Shorten the J-Curve to experience higher productivity faster.

Experiencing the J-Curve effect is inevitable. Don't try to avoid it. Instead, welcome it! Your job is to manage expectations to shorten the period of adaptation so you can get to your desired benefits as soon as possible.

### Communicate to your team

It's important that you sell the new technology, equipment, or process to your team. Inspire them with a glimpse of what life will be like on the other side. Also, make sure everyone is aware of the inevitable period of adaptation needed to get there. The visual of the J-Curve graphic can be helpful. Get them to understand the expectations that surround them and make sure they know management is on board and will lend support during the initial rocky phase.

### Plan ahead to overcome production disruption

If you know you'll experience a lag in productivity at the beginning of the new process, you'll be able to better pre-plan your production or manage your customers' expectations by not overpromising and underdelivering. To avoid missing ship dates, companies often build up safety stock before starting a new project, create alternative sources of additional production in-house, or outsource work to another supplier.

### Take the emotion out of the process

Working through change will bring about some frustration. If you know that going in, you'll be able to call it out by saying, "Great job finding this issue! Remember, we anticipated there could be issues in this area before we started. Now we can work together to create a process so it doesn't happen to us again." Guide your teams to refocus any frustration back into your procedure to reduce the period of disruption. This helps reduce drama, stress, and pressure to revert back to your previous methods while your teams are adapting.

## TACTICAL STEPS TO MINIMIZE THE J-CURVE EFFECT.



#### STEP 1 Document issues

When (not if) challenges arise, avoid the blame game and remind your teams to put the issue in front of you rather than between you. Create a simple process to document the cause and effect of all issues that negatively impact your desired outcome.



#### STEP 2 Look for patterns

You will likely discover that many of the issues you're facing will repeat themselves and create a pattern. When you identify those patterns, you'll be able to do a root cause analysis of what happened and how to avoid or eliminate those issues in the future.



#### STEP 3 Create, document, and share new processes

Create processes with your teams to overcome your obstacles. Then document and share them with your teams so they can be repeated. This will create clear expectations for the teams while building better consistency and quality into more of your operation.



## Automation can force structure.

Adding automation in manufacturing often comes with the expectation that it will be a silver bullet that magically solves problems.

In reality, you'll experience the J-Curve at first because automation helps you to see where the holes are and where you do not have process or structure. Automation forces us to become more organized and methodical in the things we do.

People can learn to adapt to many variables and overcome obstacles, but a robot cannot fix bad processes. In other words, adding automation will highlight the things that are dependent on human adaptation, and when forced to repeat these things consistently with your new system, it will not produce the desired outcome every time. You'll have to adjust and eliminate variables in order to use automation to its fullest.

For example, in a manual finishing operation, it doesn't matter how you hang a part because a human will look at it and figure out a way to paint it. If it's crooked or upside down, they may not like it, but they'll adjust and still be able to paint it correctly.

With a robot, you'll be forced to look at how you hang the part. A robot can't see if a part is coming out different than the rest, so you have to ensure that it's hung just right. You will no longer be able to manually adapt to changing variables. Instead, you have to eliminate the variables.



**ADDING AUTOMATION WILL HIGHLIGHT THE THINGS THAT ARE DEPENDENT ON HUMAN ADAPTATION, AND WHEN FORCED TO REPEAT THESE THINGS CONSISTENTLY WITH YOUR NEW SYSTEM, IT WILL NOT PRODUCE THE DESIRED OUTCOME EVERY TIME.**

## Ready, set, grow!

Adding automation and new technology will empower your people. It will inspire them to change, adapt, and grow. But you must first set realistic expectations around the inevitable J-Curve. The light at the end of the tunnel will be a bright one. The clearer you communicate that initial frustrations WILL happen, the quicker you can solve any issues and move past them. The long-term benefits of your investment, represented by the sharp upward slope of the J-Curve, will far outweigh these early pitfalls.

Companies that embrace the J-Curve concept are the ones that will succeed with adding new technologies for their companies and remain competitive during any market conditions. Remember, change is good. You just have to manage it.

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