

That Industry 4.0 Digital Factory Thing – Part 3

Joe Arvin

Welcome to the third installment of an article which is presented as a guide for navigating the topic of the Industry 4.0 Digital Factory. In the first part, featured in the August 2020 Issue of *Gear Technology Magazine*, I presented a fictional account of a Zoom meeting between me, a gear company president named Phil (a fictional character) and Chuck Gates — a very real person and one of our AGS consultants who is very knowledgeable on Industry 4.0.

In the first installment, Phil learned not to panic, for there is a methodical approach for evaluating what should or shouldn't be done. He also learned about the multi-phased approach for assessing and implementing the Industry 4.0 Digital Factory, and the specifics involved in Phase 1.

In the second part, featured in the September/October 2020 Issue of *Gear Technology Magazine*, I presented a discussion about Phase 2—Plan of Action

for the Industry 4.0 Digital Factory.

In this final episode, we continue the conversation as Chuck outlines the steps involved in Phases 3 and 4.

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Chuck: So Phil, how did you do with the steps of Phase 2?

Phil: We've developed our action plan and I think we're on track for the next phase.

Chuck: Excellent. With your action plan in place, you're ready for Phase 3, which is when you begin implementing that plan and begin to see improved business results.

Phil: Can you provide some ideas on how we can be successful with our implementation activities.

Chuck: Sure Phil. A transformation to a digital factory has many common traits with other improvement projects you've taken on in the past. But there are some significant differences. So, let me share some thoughts on how to be successful.

First of all, implementing Phase

3 of the project will require a few key elements. Because of the time and expense involved, support from **Upper Management** is essential. Also, a solid project management organizational structure and monthly monitoring will be critical for assuring optimal business results.

Phil: I would say that we have the support, the structure and systems for this type of project.

Chuck: That's great. As we talked about before, the key to being successful is to select advanced technologies that provide the best return on investment. After all, that is your ultimate goal when making these kinds of investments. And while no one is usually overly excited about spending a lot of money, I would generally say that doing something is wiser than waiting and doing nothing. Catching up later can be very painful and risky. As I've mentioned before, having a proactive plan is much better than taking a reactive approach.

## Previous Arvin's Angle Articles

In case you missed any of them, here's a list of previous articles by Joe Arvin, with issue and page number:

### Business Development for the New Year

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### It doesn't matter how efficient your plant is!

### What matters is the accuracy of your quote?

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### Can Lean Manufacturing Kill Your Job Shop?

### A Tale of Two Companies

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### You Cannot Rely on Labor Efficiency Reporting!

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### The Valued Troublesome Employee To Terminate or Not To Terminate

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## Strategies for Building Your Business

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## Solutions for Your Process Engineer Shortage

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## Training – A Top Priority for Investment

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## That Industry 4.0 Digital Factory Thing - Part I

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Aside from investing the money for this project, there is another inherent challenge that you will probably face. Moving from a company's current operational processes to advanced technologies is never easy. But then couple that challenge with other issues like the COVID-19 Pandemic, the global economy, the social and political environment, federal and state regulations, among others, it can get fairly daunting. These variables can make it almost overwhelming to consider making continuous investments for the purpose of sustained competitive advantage. This will require a great deal of focus.

Phil: Oh, I completely agree. Another challenge we have is keeping up with all the technology.

Chuck: Staying up-to-date on the trends for the digital transformation and potential opportunities for the Smart Factory 4.0 is certainly a challenge that everyone is facing. I would suggest that your team take advantage of the many technical articles available from resources like *Gear Technology Magazine*, as well as the American Gear Manufacturers Association (AGMA), and the Society of Manufacturing Engineers (SME).

Leaders in the gear industry need to be aware of the technology enablers that are available in order for them to handle product variety and volume more effectively and efficiently. This information is essential for deciding on a digital transformation strategy.

Phil: I understand. When we're ready to move on to Phase 4, what insights can you share?

Chuck: After implementing the advanced technology projects in Phase 3, you will demonstrate the willingness and ability to move to Phase 4, which I call "Step It Up." The goal of this final phase is to further expand the number of Industry 4.0 Smart Factory technologies in your operation.

Think of Phase 4 this way, Phil. Before

you Step It Up in Phase 4, you must take a look back and evaluate just how well you have done with the previous phases. Only then should you proceed to Phase 4.

If the previous phases are not progressing as quickly as you'd like, don't be frustrated. I generally tell people that the first three phases can take anywhere from nine to twelve months to accomplish. The point to remember is that you are moving in the right direction for future success. I like to tell people that it is not how fast you start; it is how well you engage and stay focused on continuous improvement.

Keep this in mind as well: Achieving a sustained competitive advantage by deploying a digital transformation is a journey with no finish line. It's never over. Continuous process improvement is in fact continuous.

So, before you proceed to Phase 4, here's what you really need to look at from the previous three phases. If the business results achieved in the initial first three phases were less than expected, then you might want to repeat the first three phases again. This is a conservative approach.

On the other hand, if the business results achieved from the initial first three phases were acceptable, then kicking it up a notch with Phase 4 is in order.

This is important to understand. In Phase 4, you will be going back and utilizing the same basic steps you took in Phases 1-3.

Again, here are those steps. First, you need to research and identify additional potential technologies to integrate. Next, you will develop your action plan. Then you will implement that plan. And finally, when that's complete, you will Step It Up again. As I said, continuous improvement is just that — continuous.

When you get to the point of stepping it up again, it will be time to map out the future projects for the next two years. This cyclical pattern provides you with a continuous digital transformation system.

To be honest; managing all of this takes a great deal of work. If needed, you might consider bringing in an outside resource who is experienced in providing guidance to organizations going through this process. And be sure to realize, there will likely be Industry 5.0 in the future. Progress and the advancement of technology will never end.

Phil: This has really been enlightening. But when you break it down like this, a lot of your methodology sounds familiar to me. In fact, it has a lot in common with the way we've always evaluated technology improvements. We have a long history of re-investing in the latest technology. Isn't the process of investing in the Digital Factory a continuation of the same approach?

Joe: You are 100% correct, Phil. The new manufacturing technologies of the Digital Factory are exactly that — new technologies. Perhaps the only new variable is that the technology is advancing so quickly. But it's important to resist the temptation to run out and buy everything that is available because someone has told you that without all of the new technology, you're going to go out of business. I've been saying this since the late 1970s, and I'm sure you'll agree. You must continually reinvest, just like you've done in the past. But you must base your investment decisions on the direct benefit to servicing your customers and being competitive. What Chuck has described in our discussions is the best practice for making these decisions in the era of the Digital Factory.

Chuck: Joe's right on target, Phil. It's important, just as it always has been, to be as up-to-date as possible with the latest technology. And for those who wait, more than likely, they'll have to struggle to catch up later.

Phil: Thanks, Chuck and Joe. These insights are really going to help as we move toward our transformation to the Digital Factory.

## Final Words

This "Industry 4.0 Digital Factory Thing" is really not some elusive black magic or industrial alchemy. So, don't get too overly concerned. It is all understandable and manageable once you break it down and figure out what is most usable for your factory. As technology continues to progress, there will undoubtedly be more buzz words to dazzle you in the future. With this in mind, remember maintaining the status quo is really moving backwards. There are lessons to be learned from what happened to the U.S. machine tool and auto industries for what they didn't do in the 1960s and 1970s.

It is my hope that this series of articles has provided you with some valuable insights as you navigate the landscape of the Digital Factory era. I would like to thank Chuck Gates for his knowledge on this subject and his contributions.

And finally, in view of the rough year we had in 2020, I would like to wish everyone a successful 2021.

Chuck Gates received his Bachelor of Science degree in Management from the University of Illinois and his Master of Science degree in Industrial Technology from Purdue University. Chuck worked at Caterpillar for forty years in numerous roles encompassing Gear Machining, Gearbox Assembly, Quality, Engineering, Training, and Management. He has received numerous Professional Certifications and Awards including that of Certified Manufacturing Engineer CMfgE. In addition to teaching a wide variety of Professional Certification Review Courses, he has taught at the college level as an adjunct professor since the 1990s. Chuck is on the roster of consultant resources for Arvin Global Solutions. 

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