

Two Minutes on Manufacturing Excellence - The Power of Systems Thinking

written by admin | October 28, 2020

It's accurate to say that effective businesspeople routinely apply "thinking models" in their work and less effective businesspeople don't. That's a pretty sweeping generalization, but it holds up much of the time because thinking models consistently do two things.

1. They promote and enable clear thinking, reason, analysis and collaboration that lead to good decision-making and positive results.
2. They defeat our tendencies towards weak thinking that is often reactive, emotional and self-centric that lead to ineffective decision-making and poor results.

Anyone can be a good decision-maker

The good news is that these models can be applied by anyone who's willing to learn them and apply them. Clear thinking and good decision-making aren't so much a matter of "smarts" as it is a matter of "effective tools and methods" that are available to anyone.

Systems Thinking Basics

There are three practical and useful thinking models we'd like to discuss. In this article, and the next, we'll consider one of those models called "Systems Thinking".

We hear the term "systems" a lot. Edwards Deming famously observed that 93% of problems are caused by "the system" and 7% by "the person". But what is "the system"? What is "system thinking"? And why is it so beneficial?

Systems and Business Systems

Generally speaking, a system is a bunch of parts working together to create an

output. So, an automobile engine is a system. And on another level, the car itself is a system. OK, so what's a "business system"?

There are lots of systems in the workplace. We have training systems, production systems, continuous improvement systems, go-to-market systems, maintenance systems and more. ***And key to systems thinking is that, while the parts and pieces of each business system are different, the primary "elements" that comprise each of those systems are the same.*** They're all made of the same following 5 elements:



1. Roles and Responsibilities (R&Rs) - Who does what
2. Knowledge, Skills and Abilities (KSAs) - The capabilities to fulfill the R&Rs
3. Work Processes - How work is done, both individually and collaboratively
4. Enablers - Technology, equipment, information, etc. that support the work effort
5. Expectations and Metrics - What's expected and results (ideally quantifiable)

What's the Value of System Thinking?


We'll talk more about the how-to and the benefits of system thinking in the next article. For the moment, let's just say that systems thinking enables us to:

- Ask the right questions
- Recognize "systematic weakness", and
- Identify "systematic solutions" that often yield sustainable positive results

Exactly the things that effective businesspeople do!

Two Minutes on Manufacturing Excellence - Assessing Your Factory Floor Training System

written by admin | October 28, 2020

In our recent blogs posts, we've discussed the challenging manufacturing environment of increasing customization and, with that trend, the need for improved job training as work continues to get more varied, complex and is always changing. 

The last two posts identified initial steps to building an improved job training system. Today's is about another critical part of that effort.

The Training System Improvement Initiative

As with all continuous improvement initiatives, an effective improvement initiative requires, among other things, the following components.

- A clear understanding of the *current state* of whatever process is being considered for improvement
- An idea of what is preferred or desired, some kind of *future state* picture
- *Identification of the gaps* between current state and future state
- A *plan for closing the gaps* in a way that most effectively supports the organization's key business objectives

When developing an improved training system, one valuable tool that can help an organization to quickly develop those four components is an effective assessment tool.

IMC Training System Assessment Tool

Given the need for so many manufacturers to improve their job training, IMC has developed such a tool specifically for the purpose of assessing the organization's factory floor training system.

The “Training System Assessment” is structured around the 5 elements of a business system.

- Roles and Responsibilities (who does what in the current training system)
- Knowledge, Skills and Abilities (KSAs required to perform effective training and qualification)
- Work Processes and Protocols (how the training, qualification, etc. is performed)
- Tools, Equipment, Information (enablers required for effective training)
- Expectations and Metrics (clear requirements for the system and quantitative results)

The 5-part format gives logical categorization to the assessment. That makes the assessment easy to complete in just a few minutes. And the categories provide a quick understanding of the current state (component 1). The specific assessment inquiries within the 5 elements provide a good start for the organization to picture and describe a desired future state (component 2). And the quantitative ratings that the company enters for each assessment item about its training system provide an excellent initial “gap analysis” (component 3). From there, you can develop component 4, a plan to close the most critical gaps.

IMC offers considerable knowledge and experience to support the efforts of manufacturers on any and all aspects of effective training system development. Contact your IMC business advisor or email info@imcpa.com to discuss further.

Manufacturing Day 2020 - The

Creative Enterprise

written by admin | October 28, 2020

**CALLING ALL PEOPLE WHO WANT TO COLLABORATE WITH OTHERS,
CREATE NEW PRODUCTS, FIGURE OUT THE BEST WAY TO MAKE THEM,
CONTINUALLY LEARN, AND BE WELL-REWARDED FOR IT.**

That's what the fast-evolving world of manufacturing is looking like more and more each day and...

WE WANT YOU!



The Manufacturing Marketplace

Fueled by today's continual demand for new, improved and more customized products and coupled with a long list of evolving technologies, American manufacturing is going through an incredibly positive and rapid metamorphosis. And yet remarkably few people are aware of the good news and the many opportunities.

Success in manufacturing is no longer...*Who can make it cheaper?* It's...*Who can make more new and customized stuff better and faster?* New, better, faster is simply where growth and profitability are to be found. And as a result, literally every aspect of manufacturing - jobs, skills, knowledge, management practices, leadership, tools and technologies, how people work together, and the environment they work in, is evolving to align with this new and exciting world of continual improvement and innovation.

What's becoming increasingly clear is that those manufacturers whose people are most engaged in these improvement and innovation practices are winning. No other factor, not reputation, current market share, revenues, assets, company size, talent,

experience or hard work; *Nothing is more predictive of future success than the enterprise-wide / everybody all-in ability to continually improve and innovate.*

The Creative Enterprise

We might call that “the creative enterprise”. And perhaps the best way to describe it is that all employees have three “jobs”.

1. To perform their work.
2. To contribute to process improvement and product innovation.
3. To continually learn and develop new skills and knowledge to contribute more in their other two jobs.

Any company that enables their people to do all three of those jobs well is going to rocket past competitors that have people only performing job one. No matter how hard they try or how effectively they do that job.

So, let’s recognize that in today’s marketplace *ideas are the currency of sustainable success. And a company’s ability to generate ideas and effectively implement them is both the mark of leadership and far and away a company’s most valuable asset.* And finally, if we want to attract and retain today’s best and brightest and get the greatest level of contribution from them, the creative enterprise is the way to go.

Two Minutes on Manufacturing Excellence - Building a Great Job Training System Step 2

written by admin | October 28, 2020

In our last article, we talked about step 1 in developing an effective training system. And how critical training has become, as products become, more customized and

specialized causing jobs and tasks to become more complex *and* to continually change. Without effective training, unwanted variation, inconsistency, errors, reduced throughputs and other wastes are inevitable.

Job Breakdown Sheets

As a first step, we described the development of “Job Breakdown Sheets”. A standardized format that describes the *ONE BEST WAY* to perform a job, listing the steps of the job, how each step is done and why it’s important. *Sample Job Breakdown Sheet*

How to Train - Job Instruction

Now let’s talk about another consideration. That is, how the training itself is performed. Below is a copy of the “job instruction card” that was part of the Training Within Industry (TWI) training system that was used extensively during WWII. And famously adopted and applied by Toyota as the foundation of the game-changing “Toyota Way”. As you’ll see, the card instructs the trainer on how to plan and prepare to train. And then provides a series of steps for training and ensuring capability and qualification.

It needs to be considered that many of today’s manufacturing jobs are significantly more varied, complex and fast-changing than they were when this methodology was initially developed and implemented. But those basic elements of preparation and instruction can be applied in almost all cases. Consistent and effective instruction methods are critical to an effective training system.



Training System Assessment


Lastly, let's also mention another important and helpful "tool" for developing an effective training system - a "training system self-assessment". IMC has developed an assessment that any company can easily and quickly complete to get a solid understanding of the current state of the company's training system. The tool assesses 5 areas as follows.

1. Training roles and responsibilities
2. Knowledge and skills of trainers
3. Processes / protocols that support the training system
4. Training tools and methods
5. Training expectations and metrics

In our next article we'll take a closer look at the Training System Self-Assessment. Meanwhile, if you'd like a copy of the assessment, email me at russl@imcpa.com.

Two Minutes on Manufacturing Excellence - Building a Great Job Training System Step 1

written by admin | October 28, 2020

In our previous two posts, we discussed the worldwide trend of increasing  product customization and specialization and the many implications of that. One being the introduction of more variation into our work processes from up-front selling and quoting through design, purchasing, manufacturing and distribution.

So how do we take advantage of the **desired variation** of specialized products that meet specific customer needs while avoiding the **unwanted variation** that diminishes quality, efficiency, predictability and profitability?

Well, one way to reduce unwanted variation is to ensure that the work itself is being done the *ONE BEST WAY*. And we do that by having a great job training system.

Where to Start - TWI

A great job training system starts with clear requirements.

Clear requirements are getting tougher to define as jobs get more complex and continually change. But answers are available using a decades-old, tried and true system called “Training Within Industry” (TWI). And IMC has adapted TWI to align with today’s more complex jobs and rapid pace of change.

Defining the *ONE BEST WAY*

TWI Implementation starts with “Job Breakdown Sheets” that provide a consistent format or template for identifying:

- **Steps** of the job
- **How-to** perform the steps
- **Why** the step is important (usually for key steps)

The aim of the Job Breakdown Sheet is to describe the *ONE BEST WAY* for doing a job as simply and briefly as possible while ensuring consistency of results and outputs. And of course, the people developing the Job Breakdown Sheets must know the jobs well.

Job Breakdown Sheet templates are available from many sources. We at IMC often use a format developed by *Systems 2 Win*.

Up Next

In our next article we’ll talk about next steps for implementing TWI and introduce IMC’s recently developed “Training System Self-Assessment” that’s available to all area manufacturers.

Two Minutes on Manufacturing Excellence - Stop the CHAOS! Improve Your Training

written by admin | October 28, 2020

Stop the CHAOS! Improve Your Training

The Inevitable Trend

In our previous post, we talked about the worldwide trend towards more customized and specialized products and how that trend translates into significant challenges (and opportunities) for manufacturers.

Let's face it. Making more customized and specialized products (that are more complex and always changing) and doing that efficiently and profitably isn't easy.

Variation and Chaos

Customization introduces more variation and puts pressure on our traditional methods of quoting, purchasing materials, design and then manufacturing these differentiated products. And when our operational systems aren't a match for these increased demands, we get... **CHAOS**.

So what is chaos? Chaos is simply the reactive environment we get when an overabundance of variation breaks down our routines. As we know from Lean / Continuous Improvement, unwanted variation is the #1 enemy of manufacturing and it results in a) operational waste and inefficiency; b) a culture of reactivity; c) a lack of profitability; and d) employee frustration.

Reducing Chaos

So how do we meet customer increased demands while reducing or eliminating the variation that creates the chaos?

Well there's a combination of answers to that. But for one thing, we sure don't want lots of variation in how our people perform their work. Manufacturers *MUST* have effective training and qualification methods that ensure that workers are able to consistently perform work *THE ONE-BEST-WAY*. And that requires a *top-to-bottom effective training system*.

And the good news is that there are proven, time-tested tools and methods that any company can learn and apply that will ensure that people are able to do their jobs the one-best-way. And to continually adapt that one-best-way as requirements change.

In our next article we'll continue the discussion with something called "Training Within Industry" (TWI) and how IMC is adapting TWI to help manufacturers reduce variation, errors, frustration and chaos and to increase efficiency and profitability. We'll start with "Job Breakdown Sheets" and the basic "how-to" of effective training and go from there.

So until then, let's keep turning challenges into opportunities.

Two Minutes on Manufacturing Excellence - Customized, Specialized Products

written by admin | October 28, 2020

Customized, Specialized Products - Challenging? Yes. Doable? Definitely!

THE OPPORTUNITY

I think we all get it that the manufacturing we lost to foreign competition (China in particular) over the past couple decades was mostly commodity products that they could make much cheaper and often “good enough”.

But as we’re all seeing now, the *worldwide trend is away from simple-to-make commodity products and long product runs and towards increasingly specialized, customized products and low volume, even one-at-a-time product runs.*

THE CHALLENGE

More and more often, the demand is to be able to...

1. Continually discover, understand, and define the customer’s evolving needs;
2. Rapidly design a product that meets those needs;
3. Rapidly and efficiently manufacture a product that may be different (parts, materials, sizes, functionality, colors, packaging, etc.) and more complex; and
4. Get the product to the customer on time and in a short timeframe

So, is that easy? Heck no. But that’s where the money is and how we maintain and grow customers and relationships.

In a nutshell *it’s all about “rapid adaptability” throughout the entire business.*

THE SOLUTION

So the question is... How do we do rapid adaptability? Or *how do we “standardize the customized”?*

Well the good news is that answers exist. And while every company has unique challenges that require a tailored approach, there are tried and true methodologies for becoming an increasingly efficient and effective manufacturer of complex customized products.

And the *really good news is that the resources for doing that are right here in Central PA.*

IMC can support your efforts on the “customer side” and on the “design and

manufacturing side". That's what we're all about and as your Pennsylvania Industrial Resource Center, we're at your service.

If you'd like to find out more, contact us at info@imcpa.com or call 800-326-9467.

Why Networked Communities are the Key to Recovery

written by Lauri Moon | October 28, 2020

Written by Erica Mulberger, Executive Director, CPWDC

As Memorial Day has come and gone with no parades, no baseball, and no large summer kick-off parties, one thing has remained constant: Central Pennsylvanians stayed committed to ensuring our friends, family, neighbors, and co-workers would come out of this pandemic just as strong as we were going into it. We know this is far from over, but through everyone's efforts to social distance and work together to provide PPE for the healthcare providers and other businesses, the nine counties representing the Central PA Workforce Development Area are in the "yellow" phase with some counties moving to "green" this week.

This Central PA stick-togetherness and creativity (like the idea of using waterproof house wrap to make intake gowns) caught the attention of the national team that started the Next Generation Industry Partnership model, and they highlighted the work of the MADE in Central PA manufacturing partnership and the Central PA Healthcare Partnership's response to COVID-19 in this article, [Why Networked Communities are the Key to Economic Recovery](#), written by Francie Genz, Co-Principal, Institute for Networked Communities.

This is all started with the joint healthcare and manufacturing partnership Zoom meeting in late March which resulted in the plan put together in the email below.

I have to give a special shout-out to Tom Kapelewski who continues to be the point person on this project, connecting local partners with raw material and parts suppliers from all of over the US! And another shout-out to Geisinger and Evangelical Community Hospitals who provided designs and input into usable materials.

Lastly, kudos to everyone on this email for continuously doing your part to protect our families, our businesses, and our communities. #CentralPAProud

IMC is a proud member of the MADE in Central PA Manufacturing Partnership!

Study finds more than 13:1 Return on Manufacturing Extension Partnership Program

written by Lauri Moon | October 28, 2020

A new study by Summit Consulting and the W.E. Upjohn Institute finds that the National Institute of Standards and Technology's Hollings Manufacturing Extension Partnership (NIST MEP) Program generates a substantial economic and financial return of nearly 13.4:1 for the \$140 million annually invested by the federal government. The NIST MEP program, of which IMC is your Central PA MEP, is a public-private partnership created in 1988 to improve the global competitiveness and productivity of America's small- and medium-sized manufacturers.

Using the national REMI® model, along with the results from the FY2019 NIST MEP client impact survey conducted by Fors Marsh, LLC., the team finds that economic returns are robust. The study uses a conservative approach in estimating the broader economic impacts of the program by examining the competitive interactions between firms. NIST MEP contracted with Summit and Upjohn to create a study to

estimate the broader national impacts of the NIST MEP program. The study and the subsequent report, *The National-Level Economic Impact of the Manufacturing Extension Partnership (MEP): Estimates for Fiscal Year 2019*, is now available.

“Year after year, the Upjohn Institute reinforces the worth of the MEP National Network to the small and medium-sized manufacturing community,” said Dan Manetta, IMC Executive Director/CEO. “The results of this report show good ROI for individual manufacturers, along with significant contribution to the U.S. Treasury.”

A Positive Return on Investment

The study reports that the \$140 million invested in MEP during FY2019 generated nearly a 13.4:1 increase in federal personal income tax (\$1.87B/\$140M federal investment). The study only looks at personal income tax and not business taxes. In addition, the analysis provides a conservative estimate of broader impacts as they are based only on completed surveys and do not include estimates of additional impacts of center-activities for non-respondents.

The MEP Program Generates Additional Jobs for the U.S.

The study finds that total employment in the U.S. is nearly 217,000 higher because of MEP center projects. This estimate includes both direct, indirect, and induced jobs generated by MEP projects. These jobs support additional manufacturing jobs critical to U.S. supply chains and jobs outside of manufacturing.

Other Positive Impacts of the MEP Program

The study examines additional areas of economic impact generated by the MEP Program. It finds: (1) personal income is \$14.0 billion higher, and (2) GDP is \$22.9 billion larger. This translates into an increase of \$1.87 billion in personal income tax revenue to the federal government.

About Innovative Manufacturer’s Center

Founded in 1988, the Innovative Manufacturers’ Center assists in connecting manufacturers in 12 Pennsylvania counties with the most effective regional, state and national resources to help companies innovate, grow and prosper. An affiliate of the U.S. Department of Commerce, National Institute of Standards and Technology’s Hollings Manufacturing Extension Partnership and supported by the Pennsylvania

Department of Community and Economic Development, IMC is one of seven industrial resource centers in Pennsylvania and serves manufacturers in Lycoming, Montour, Northumberland, Union, Snyder, Clinton, Centre, Mifflin, Juniata, Huntington, Blair and Bedford Counties.

About the MEP Program.

MEP has centers in all 50 states and Puerto Rico that are dedicated to serving small- and medium-sized manufacturers with over 1,400 trusted advisers who work with local manufacturers to provide services that improve their competitiveness and productivity and help create and retain jobs, increase sales and improve local economies.

About Summit Consulting.

Summit Consulting is a quantitative and management consulting firm that works with public and commercial clients to turn data into actionable intelligence. Summit's partners, directors and subject matter experts lead teams in five core areas: federal credit and risk analytics, health and employment, litigation analytics, mortgage finance, and program management and business modernization. Summit couples core expertise with methodology to derive sound, transparent and reproducible results.

About the W.E. Upjohn Institute for Employment Research.

The W.E. Upjohn Institute for Employment Research was created in 1945 from the W.E. Upjohn Unemployment Trustee Corporation, established in 1932 to address issues of unemployment during the Great Depression. The Upjohn Institute is a private, nonprofit, nonpartisan, independent research organization devoted to investigating the causes and effects of unemployment, identifying feasible methods of insuring against unemployment and devising ways of alleviating the distress and hardship caused by unemployment. Upjohn's broad objectives are to: (1) link scholarship and experimentation with issues of public and private employment and unemployment policy; (2) bring new knowledge to the attention of policy makers and decision makers; and (3) make knowledge and scholarship relevant and useful in their applications to the solutions of employment and unemployment problems.

More information, including the full report, is available at the Upjohn Institute

website.

Local Manufacturer Shares COVID Health and Safety Compliance Procedures

written by Lauri Moon | October 28, 2020



Data Papers, Inc. in Muncy, PA developed an assortment of policies / procedures relative to employee health and safety and regulatory compliance for their facility as they get back to semi-normal operations and offered IMC to share these with the manufacturing community.

Thanks to Jerry Wertz and the team at Data Papers, Inc.!

C19-003a Freq Touched Area Cleaning Checklist DP

C19-003 Cleaning Procedure for Freq Touched Areas DP

C19-002 DPI Employee Working Procedure DP

C19-001 Probable or Confirmed Diagnosis DP