Two Minutes on Manufacturing Excellence – The Power of Systems Thinking (Part II)

written by admin | November 11, 2020

In our previous article (read first), we talked about the value of thinking models and in particular "systems thinking". To support systems thinking we identified the 5 Elements of a Business System. And we said that ***every business system is comprised of these same 5 elements.*** Now let's dig into systems thinking a little further.

I sometimes call systems thinking "instant business genius". And here's why.

Common Weak Thinking

By our nature, we tend to have two weaknesses in our thinking, especially when we view a problem.

One, we often think that what we know is what there is to know. We erroneously don't respect the fact that any of us can only know a percentage, often a small percentage, of what there is to know and understand about a situation or a problem.

The other common thinking weakness is we see problems "in isolation" – we might say within a small "immediately viewable" circle of causes and effects.

Those two "thinking weaknesses" lead to reactivity as a way of operating. They cause us to draw conclusions and implement solutions that range from totally ineffective to limited or partial success. Surely we can do better.

"Seeing" the System

In the workplace there are "3 levels of activity" going on all the time:

1. The specific tasks being done
2. The larger business process that the task is a part of
3. The overall output of the process (both expected and actual)

And along with that activity we have our “5 Elements of a Business System”:

- Roles and Responsibilities (R&Rs)
- Knowledge skills and abilities (KSAs)
- Work processes
- Enablers (tools, equipment technology, info)
- Expectations and metrics

Systems thinking has our mind’s eye “seeing” the workplace in terms of all 3 of those levels and all 5 of those elements all the time. We’re seeing the workplace as a system. It’s not hard to do if we make efforts to do it. And with that we carry an assumption. That is, that if any of those 5 elements is weak, let alone a combination of them, then the process and the outputs will almost certainly be sub-par.

Seeing Problems Systematically

So when a problem occurs, we immediately “see” the problem within the context of the system. It’s easy to see how that perspective immediately defeats those two weak thinking tendencies. And do you now get why Deming said that problems are 93% because of the system?

In our next article we’ll use an example to apply systems thinking and then begin to talk about another powerful thinking model.

Two Minutes on Manufacturing

Excellence – The Power of Systems Thinking

written by admin | November 11, 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, <u>the primary "elements" that comprise each of those systems are the same</u>***. 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)

<u>What's the Value of System Thinking</u>?

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 | November 11, 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 | November 11, 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 | November 11, 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

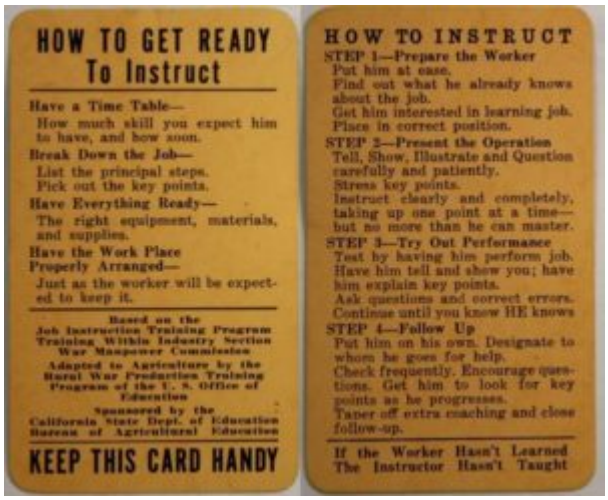
As a first step, we described the development of "Job Breakdown Sheets". A standardized format that describes the *ONE BEST WAY* to perform a job, listing the

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 | November 11, 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 | November 11, 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 | November 11, 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.

Sustainable Success in a Fast-Changing Marketplace – Comments from a Local Manufacturer

written by admin | November 11, 2020

Below is a real story with multiple timely and important messages from one of our area manufacturing leaders who has chosen to remain anonymous.

One of the important messages… Yes, it's important to be as efficient as possible in *how* we do things (continual process improvement). But if we want sustainable success, we also have to continually innovate *what* we bring to the marketplace. As in creating new and differentiated products and services that are meaningful to customers. Because the competitive landscape is a more rapidly evolving place than ever. Check it out.

Today's lunch learning is more personal. A few months ago, I got news that a plant I once managed (20+ years ago), a super plant it was called in its day, a model for operations around the globe was closing and it was moving to Mexico. It reminded me in the days of super competition in electronics where our plant was competing, not just for business for its overall corporate needs, but our individual plant was competing too within the organization and globally. The livelihood of our people had to do also with its competitiveness within the organization. I used to say, we want to

have the best bike! The bike everyone wants to have. When customers come to the US and are going to visit a plant, and there are 10 of them, we want ours to be the one chosen. We needed the best, the most enthusiastic people. The best the most cutting edge and performing assembly lines. Not just that perform, but that were "marketable." We needed to provide for the community in a visible way too. And we did! And we were very successful. We were on all the college tours, excellence tours and even written about in top improvement books having to do with World Class Manufacturing.

Now after 20 years, its going to be gone, and the people there were told that there aren't jobs for them at other plants. The best performing plant in the past, no longer a star. Its not to be looked at as a model of what to do and how to do it, but maybe what not to do. The employees once leading the culture change, now gobbled up by another. What is the lesson? Hard to say and its likely many contributors, but maybe, it got complacent. Maybe in its glory it lost sight. I know, some of you might feel how can you compete south of the boarder, I know we can as we did successfully for some time. Maybe it forgot it was competing.

I learned early about competition starting my career in Boston. Simplifying, we were told once to embrace in-process manufacturing and eliminate departments. I remember being a bit on the side lines and very observant noting that the company gave corporate every excuse why we couldn't do what they wanted. We didn't know another plant, not as experienced, was given the same directive. They were successful, we weren't. One day I came in, every manager and most senior level types we gone. Of course, then all the support types reported that they could do as desired, but the wheels of motion were already in play. It was the start of my career and success, I think because I learned from this. I never forgot that experience. It was a scary hard truth. I literately let hundreds of people go as the plant closed and moved. The hollow look in their eyes would later be a motivator to me to prevent similar. I still have contact with those very first employees too, how lucky a guy!

I think about how many great companies we remember and who would ever think that they could collapse, vanish….They were the best of the best! Weren't they? I think this helps to point to the need to be constantly innovative. To be humble and competitive in all times. To use innovation and break paradigms. History is

knowledge, if we choose to pay attention. At least, that is what I think! Remember these folks next time one thinks they are too big to fall. I point to business, but we can also point to people.

- *Sears – ????*
- *Panam*
- *Compaq*
- *MCI – WorldCom*
- *Enron*
- *Arthur Anderson*
- *TWA*
- *Woolworth's*
- *Eastern Airlines*
- *Kodak*
- *Block Buster*
- *Radio Shack*
- *Polaroid"*

Innovation as a Science and System

written by admin | November 11, 2020

A very good (and short – 3 pages big print) research-based article on innovation as a system. Very much supports the whole concept that is Innovation Engineering – that innovation is a systemizable business practice that any organization can on-board and benefit from. And consistent with IE concepts and ideas.

Whether CI or Innovation, it's all about the system or lack of it. The realization is that these management systems drive success because they activate and foster the "raw material" that's already there. People's creative horsepower.

Click here to check it out.