

Great Systems Measurement Work System Improvement Tips

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How to Measure and Improve Your Process Measurement Work System


How do you measure and improve your measurement work system? Do you measure measurement work system effectiveness?

The best organizations capture counts and ratios at the process level, for all key processes.

Plus, they use an effective goal setting process. Finally, a balanced scorecard exists for each work process.

Read on for more measurement work system design best practices.


Top Measurement Work System Weaknesses



- Measures are used more as a hammer
- Balanced sets of measures are not defined
- Measure sets do not exist for all work processes
- Few measures are trended over time – mostly snapshot comparisons
- Groups are not able to build theories from trends
- Process variation and capability are not understood
- Lagging counts are used too often – leading ratios too little
- Mixed measures make process-specific trend analysis difficult
- Only a small percentage of work teams use in-process measures daily
- Low-tech measurement systems consume too much time to use

The Hammer

Poor measures - Few trends - Reactive behaviors – Weak theories



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What Does Your Process Measurement Work System Measure?

My perception of what 'good' measurement is changed drastically after learning that the Sanskrit roots of the terms "measure" and "illusion" were the same.


As an engineer, I was taught that measures were absolutes. We require measures for work, and we usually believe what they tell us.

Peter Senge taught me that we tend to measure things that we are uncertain about. If we think we know how something works or performs, we see no need to measure it.

Selecting Key Measures

<h4>Measure Definition Questions</h4> <ul style="list-style-type: none">• Count or ratio?• Leading or lagging?• Outcome or in-process?• Macro or micro?	<h4>What Determines Frequency?</h4> <ul style="list-style-type: none">• Transaction rate / cycle time• Error or defect?• Need to learn rate?• Need to improve rate?
<h4>Ratio Types</h4> <ul style="list-style-type: none">• Time-based (clock or people)• Transaction-based• Cost-based• Driver-based (i.e., SFT)• % of total	<h4>Key Design Questions</h4> <ul style="list-style-type: none">• How do we select our measures?• How do we select our color ranges?• How do we react to our trends?• How should we review performance?

Each process scorecard should have 2-3 ratios per KPA

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Often, we tend to measure for the wrong reasons. We measure to trap people, to hold them accountable, or to prove a point. Most focus on outcome measures for the site. Rarely do we measure to understand systems.

This is really the primary reason to measure a process or your performance. We cannot know everything about what makes a system work. However, we can use measurement to help us understand systems, and ourselves, better.

Fundamentally, there are only three types of great measures, with all of them being some form of ratio. We use time ratios and cost ratios the most often. Ratios that show how one variable performs against another (i.e. miles per gallon) are perhaps more powerful.

However, we don't tend to use this type of ratio often. Could this be because we are not in search of systems understanding as our measurement goal?

Operational definitions and measurement procedures are also key, but we often work without them. Without these definitions, people can measure what they want and make it look like they give you what you want.

Even without the intent to deceive (protect oneself), a lack of operational definitions leads to confusion about what one should count. Not using operational definitions can also lead to key data being ignored or 'crunched' incorrectly.

Use Trends to Understand Process Behavior Over Time

Measures mean little when they are not part of a trend line. Measures without trends are only snapshots.

One way to learn more about a system is to look at that system’s performance (behavior) over time. The goal is to build theories that we base on what the picture shows us.

The graph, or picture, is where we start with systems improvement. However, it is not the result we desire.

Similarly, trend analysis means little if you do not perform such analyses with a diverse group of stakeholders. Plus, you must keep an open mind towards learning.

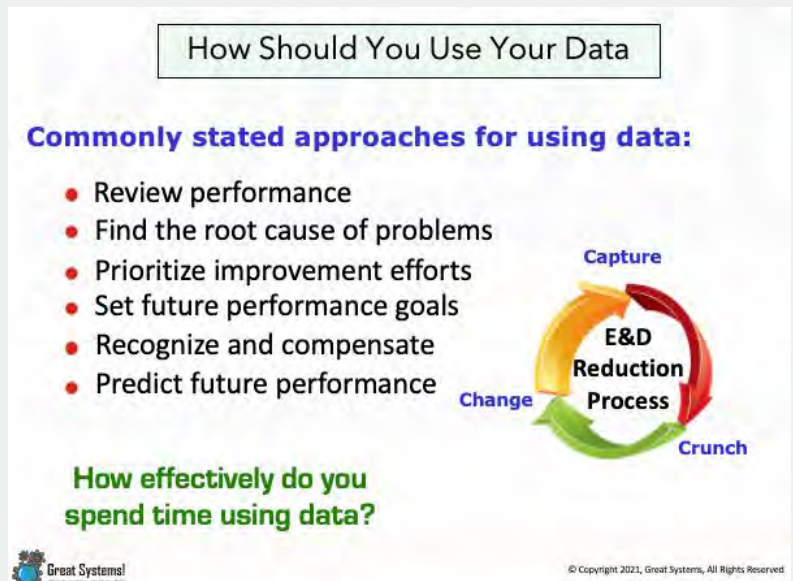
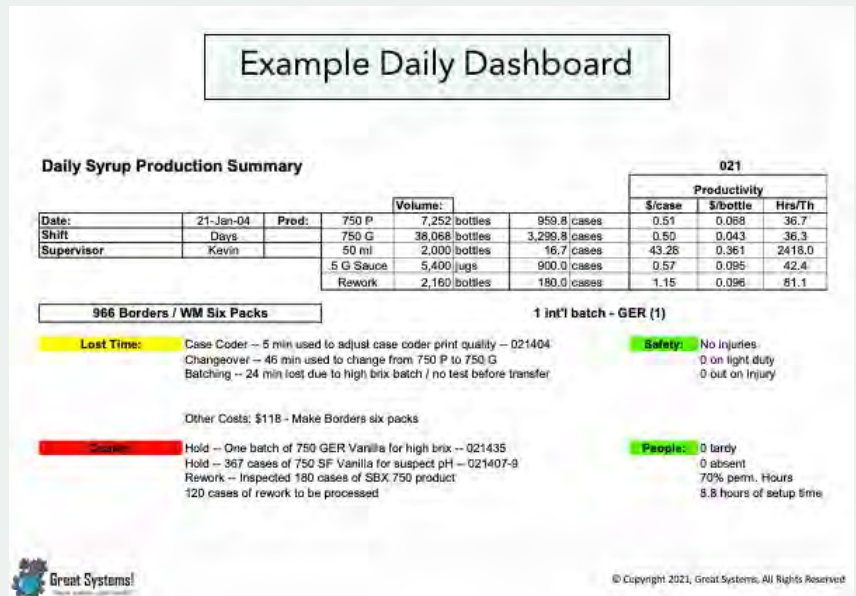
If we set performance goals that are outside of our current system performance range, we should also know what system changes we expect to help us get there. Strategies that simply ‘ask’, or even pay, for higher levels of performance may only work for a short amount of time. These strategies may not work over the long term.

Use Your Work Measurement System to Understand Process Capability

When we use correct measurement practices, we should learn more about the types of results our systems can consistently produce. All too often, leaders expect levels of process performance that fall outside current process capability levels.

In other words, great trend analysis shows us what type of results we can expect from our systems.

If we want a level of performance that is outside the current capability of the system, fundamental changes must be made to reach that higher level of performance.




How Many Measures in a Process Measurement Work System?

Can you believe it? People often actually tell me that I measure too many things as part of my daily life! From my perspective however, there is a method to my measurement madness. First, I feel it is important to trend performance in all key performance areas.


Such areas include safety, quality, people, cost, and growth. Secondly, experience has shown me that the best teams improve when they measure enough different things to truly understand each of their key processes.

What are Your Vital Signs?




Human Body

- Heartbeats / minute
- Blood pressure
- Respirations / minute
- Body mass index
- Years of age



Dental Office


- Revenue / office hour
- Visits / office hour
- Complaints / M visits
- OOPs errors / M Visits
- Staff retention rate



Food Plant

- Pounds / minutes
- Cost / pound
- OSHA accident rate
- Non-conformance rate
- Retention rate

A process scorecard shows the vital signs for that process (1-2 ratios per KPA)



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Through my Baldrige experience and personal successes, I know that the best organizations and teams measure two to three key metrics in each of the four or five key performance areas monthly. They track and trend additional in-process throughput and waste measures daily for each key process. The best companies I work with and visit normally review performance trends for 25-30 key measures on at least a monthly basis.

Engage EVERY Work Team Leader in Daily Measure Capture

Tracking this number of numbers may intimidate people. It is not that bad IF each work team leader assumes the responsibility to (1) track 5-20 measures and (2) use a spreadsheet to capture key information each day. This is where the key to sustained improvement lies.


The key is to get EACH person in the organization, or at a minimum, each work team leader, to routinely capture (EVERY DAY) their key performance drivers and measures.

Example Performance Summary Spreadsheet

March 2007 Performance Summary for Operations Team Meetings

Avg. Labor Cost per Hour = 530.00 Meeting Process Owner = Bob Thompson

Date	Meeting Type	# of People	BASE DATA			PERFORMANCE RATIOS and LEVELS							
			Planned Length	Actual Length	Extra Minutes	Meeting Cost	Effic. Score	Total Defects	Late Arrivals	# of Tangents	# of Discourts	Ineff. Cost	
1-Mar	Daily Operations	8	30	28	0	\$120	75%	6	1	2	3	\$40	
2-Mar	Daily Operations	7	30	31	1	105	65%	6	0	4	2	57	
5-Mar	Daily Operations	8	30	33	3	120	80%	7	2	3	2	30	
6-Mar	Daily Operations	7	30	29	0	105	65%	6	0	2	4	57	
7-Mar	Daily Operations	7	30	27	0	105	50%	6	0	5	1	105	
8-Mar	Daily Operations	8	30	35	5	120	75%	3	0	3	0	40	
9-Mar	Daily Operations	8	30	28	0	120	90%	7	0	4	3	13	
12-Mar	Daily Operations	8	30	36	6	120	55%	8	1	2	5	98	
13-Mar	Daily Operations	8	30	22	0	120	60%	6	1	3	2	80	
14-Mar	Daily Operations	7	30	40	10	105	75%	7	0	4	3	35	
15-Mar	Daily Operations	6	30	30	0	90	80%	4	0	3	1	23	
16-Mar	Daily Operations	8	30	27	0	120	85%	4	0	3	1	21	
19-Mar	Daily Operations	8	30	29	0	120	90%	3	1	2	0	13	
20-Mar	Daily Operations	6	30	31	1	90	95%	3	0	1	2	5	
21-Mar	Daily Operations	8	30	32	2	120	80%	3	0	1	2	30	
22-Mar	Daily Operations	8	30	25	0	120	85%	1	0	0	1	21	
23-Mar	Daily Operations	7	30	28	0	105	75%	2	0	2	0	35	
26-Mar	Daily Operations	8	30	37	7	120	95%	2	1	1	0	6	
27-Mar	Daily Operations	8	30	28	0	120	90%	1	0	0	1	13	
28-Mar	Daily Operations	8	30	29	0	120	85%	2	0	0	2	21	
Totals		20	151	600	605	35	\$2,265		87.0	7.0	45.0	35.0	\$743
Avg.			30.0	30.3	0.3	\$113	78%	4.4	0.4	2.3	1.9	\$37	
Feb Avg.		19	8	30.0	31.0	1.0	\$115	73%	5.7	0.5	3.1	2.1	\$43
YTD		20	8	30.0	31.5	1.5	\$118	74%	5.3	0.6	2.9	2.0	\$41



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Without such data, they will struggle to understand process performance.

You can also capture certain types of information in a 'random sample' manner. Most measures, however, need to be caught and trended daily, if not more frequently.

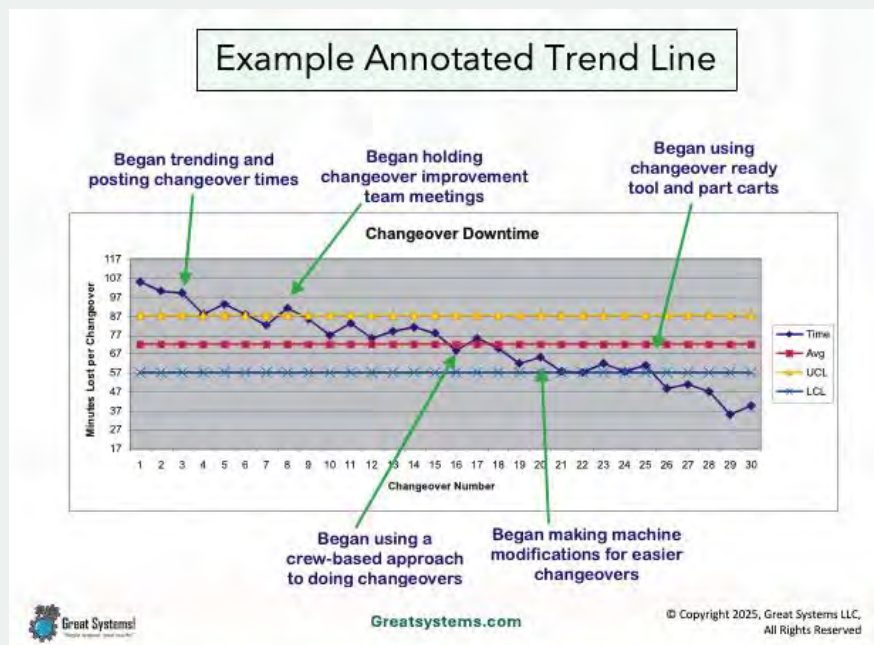
In doing so, each work team leader will better understand the processes they are responsible for (and paid to improve). Plus, they acquire valuable information to help them identify, prioritize, and justify, future improvements.

Use Measures to Guide Behavior Change

Think about it. Most of the significant changes that we would like to see involve (1) most of our people and (2) behavior change the lasts on their part. This is especially true in organizations that provide a service.

We cannot use machines as easily to control, or at least pace or guide, human behavior.

We want people to change their behavior, and we want them to continue to act in the new way. How do we get people to change?



One answer lies in the world of technology. We use entry screens more and more to place orders, track transactions, and build databases. Word processing, spreadsheet, and presentation software are used as common tools. To some degree, these tools affect the performance of the people that use them.

Use Technology and Measurement and Wisely

If a field on the entry screen contains incorrect data, the transaction cannot proceed. If the conveyor belt is sped up slightly, people will have to work faster. When we scan the employee's ID into the handheld scanner, we link the process to person. These are all examples of fundamental system changes that help shift performance in organizations.

Plus, they are examples of changes that could damage the more unmeasurable and important morale metric if we use them ineffectively. Mechanical system changes often give us the measurable results we want to find, but we often discount the possible behavioral impact of an 'improvement.' Don't expect more from a process than it can provide.

In the future, expect to see more examples where new technology drives how we measure work. Such systems changes may be affecting you already!

Would You Like Some Measurement Work System Improvement Help?

For over forty years, I have helped design and install process measurement work systems in many different companies - both small and large.

Such experience helps me discover value added, simple ways to set up systems to measure process effectiveness.

For example, I can help you create KPI scorecards that align process performance and really tell a company's improvement story.

An effective measurement work system helps each process owner better understand what makes the process they own tick.


Try to avoid the use of measures as a hammer. That practice is the primary power restrictor for the process measurement work system. My measurement tools help you both eliminate that barrier and move forward more rapidly towards higher levels of performance.


If you have interest in the process measurement work systems and tools that I offer, send me an e-mail at kevin@greatsystems.com.

Improving Your Measurement Work System

Here are eleven ways to improve your measurement work system:

- Identify key performance areas, such as safety, quality, cost, people, and growth
- Use work groups to identify key performance metrics for each performance area
- Identify sources and definitions for each key metric (process counts and ratios)
- Use a spreadsheet to collect and chart key data over time
- Construct trend line and control charts for each key metric
- Post and update performance charts regularly in all work areas
- Teach others about how to use the charts and what they mean
- Use work groups to identify and prioritize theories to improve performance
- Monitor and note improvement impact results on your line / control charts
- Continue to drive out special cause variation and reduce common cause variation
- Work to lower the system average once variation has been reduced

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About the author

As Chief Excellence Officer of Great Systems LLC, Kevin McManus provides virtual coaching and content to help people use proven best practices to enhance and optimize their daily work systems.

Over forty years of work experience in roles such as Industrial Engineer, Training Manager, Production Manager, Plant Manager, and Director of Quality give Kevin a 'real life work' perspective relative to daily work process optimization, work team engagement and empowerment, and sustainable operational excellence.



As a contract trainer for the TapRoot® root cause analysis process, Kevin has taught over 450 courses and further enhanced his ability to help leaders proactively minimize risk, reduce errors, and improve reliability. Kevin holds an undergraduate degree in Industrial Engineering and an MBA. He served as a national Malcolm Baldrige Performance Excellence Award Examiner for twenty years, including a three-year term on the national Judge's Panel.

Kevin has authored the monthly performance improvement column for Industrial and Systems Engineer magazine for over 20 years, is an Institute of Industrial and Systems Engineering Fellow and has been a member of IISE for over forty years. His newest book, "Different Company – How the Best Build Great Organizations", will be published in late 2025.

If you would like more information about the improvement tools and systems I have to offer, please send me an e-mail at kevin@greatsystems.com.

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"The first step on the road to high performance begins with a choice."

Kevin McManus, Great Systems!



Great Continuous Improvement Books by Kevin McManus!



Pursuing Process Excellence

- 150 pages of ideas and examples that will help you accelerate and sustain your process improvement efforts
- Over 25 examples of 'best practice' assessment tools that leaders can use to encourage and support high performance work
- 12 team exercises that you can use to begin applying each concept as it is learned



Mistake Proofing and Corrective Action Writing

- 156 pages of exercises, tools, and examples to help you learn about and practice the fundamentals of mistake proofing and corrective action writing
- 14 exercises you can use to practice the five key mistake proofing tactics and identify tasks and processes to target for improvement
- Over 100 proven techniques to help minimize the risk and error potential associated with daily job completion



Error Proof

- 162 pages of examples, strategies and dialogue questions to help you stop daily goofs for good
- Over 100 proven best practices that you can use to help error proof your key work processes
- Can be paired with the 100-page workshop workbook that contains 13 team exercises to help you begin applying key ideas



Facilitating and Leading Teams

- 182 pages of ideas, tools, and examples to help you improve work team, project team, and focus team effectiveness
- 10 assessments that will help you identify areas of strength and weakness relative to work and project team support
- Over 20 team exercises that will help you optimize your use of teams and improve meeting effectiveness, while also practicing your facilitation skills



Lean Tool Use Basics

- 150 pages of exercises, tools, and examples to help you learn about and practice the fundamentals of lean thinking
- 13 exercises you can practice to learn more about using the five key lean tools, creating a lean culture, and planning for lean success
- Two assessments to help you gauge the degree of support your lean efforts require and how much progress you make

kevin@greatsystems.com
206.226.8913

greatsystems.com

