SUSTAINABLE PRODUCTIVITY NEWS

"for improving operating margin with Continuous Process Improvement tools'"

When Forecasting, Being Precise is Not Appropriate!

As an intern for GM in 1985, I spent a summer collecting data on breakdowns for a new automated assembly line. Collect data during the day, download it to the mainframe at night, then analyze it the next day. When analyzing this data, it was easy to be precise in identifying the frequency of breakdowns and the average time it took to repair the machine.

Trained to Look @ Data with Precision

With 30 additional years of operational engineering work, I have had many additional opportunities for doing data collection and analysis. And consistently, when looking at historical data, it is appropriate to be precise.

This is because we are analyzing a set of numerical values, with each value a measurement of something that has happened. For example, amount of maintenance labor required to fix a tractor, number of cartons packed, etc. These values are a precise fact.

Forecasting: Wise to Be Imprecise

In addition, over half of my career was spent developing and using simulation models to predict how our operations will perform when we make changes to them. With simulation, we were predicting (forecasting) what would happen in the future. As a result, the values we are generating are an imprecise estimate (forecast) of what will happen.

Being precise in reporting our analysis of imprecise values is statistically dangerous. It could lead us to choose the wrong option amongst alternatives. For example, if you report that a simulation predicts the number of cartons packed to be 1500, which is a precise value, you are misrepresenting the results. Instead you should report that the number of cartons packed will be in the range of 1480 to 1520 with a 95% confidence level. In simple terms, this means that 95% of the time, you will get a value of 1480 to 1520.

That is why when using simulation and other forecasting models, we focus on knowing the confidence interval of the answer versus looking for a precise value. A precise answer, when projecting forward, is not appropriate.

Khaled Mabrouk

SPS developing Productivity Program for Small Farmers, and we need the help of 3-4 Santa Cruz County based small farmers.

We need the help of 3-4 owners of small farms for 1-hour per month during September-December to assist in our effort to develop a productivity program focused on helping small farming operations. You will be asked to provide feedback on how to make productivity improvement tools easy for small farmers to implement. Your benefit from participating is that you will learn about Lean thinking, Continuous Process Improvement, and how to best apply them to farming. If interested, please email me at: kmabrouk@ReduceOR.com

Data Collection & Analysis:
Key Driver of Productivity Program Success

The first time you need to leverage data collection & analysis skills is when you start the problem-solving process and seek to understand and frame the operational improvement opportunities at hand.

Initial Focus on Qualitative Data

At the onset, you interview frontline operators and supervisors to gather high-level observations about the process. The data collected at this stage is more qualitative in nature and will include things like procedures, decision-making logic, categories of equipment failure, etc.

Next, you dive deeper and begin the root-cause analysis (RCA) effort. During RCA, you need to leverage data collection and analysis skills as you collect more information about the process.

This includes brainstorming with the problem-solving team and using a Fishbone Diagram to generate ideas about what might be causing the problem to occur. Or, collecting data for a Pareto Chart, which is a tool for identifying major versus minor causes of a problem. Employing data collection and analysis during the RCA effort will give you critical insight into why the problem is occurring and lead you closer to resolving it for good.

Enhance Understanding with Quantitative Data

At this phase of the problem-solving process, you focus on collecting detailed, quantitative data for the process/problem being investigated. For example, if frequent equipment breakdown is the major contributor to poor production throughput, then you need to measure current (i) throughput, (ii) time between failures, (iii) repair time, (iv) repair costs, plus any other critical metrics

to establish a clear baseline of your current operations.

Look for Patterns in Data

Through data analysis, you will notice patterns or trends that give you further insight into when and why the problem is occurring, and how to

Senior OE, Katy Griffin, Collecting Data in Field

fix it.

The final steps of the problem-solving process are focused on solutions. First, you generate and prioritize solutions to the operational problem, then you implement and experiment with preferred solutions before selecting an optimal solution to sustain. Even in this stage, you need to exercise data collection and analysis skills to measure the effectiveness of all your hard work.

If you are interested in learning more about this topic or need help with data collection and analysis to solve a critical problem in your own operations, please email me at: kgriffin@ReduceOR.com

Katy Griffin

Optimize Warehouse Management Systems

Warehouse Management System (WMS) is a helpful tool in facilitating daily operations at warehouses, as well as enabling better planning and accurate data reporting. Since installing WMS is a significant investment, it is critical to ensure that it will perform as efficiently as possible. Simulation is a non-disruptive and relatively inexpensive way to ensure the WMS will significantly increase efficiency.

WMS is a Decision Maker

In managing warehouses, our challenges include:

- Hard to find items: operators know only from memory where items are stored.
- Inaccurate inventories: inventories fluctuate due to disappearing inventory. Many times, requiring someone to physically count the inventory.
- People having to transport material from one side of the facility to the other side.

WMS can facilitate all the above activities, ensuring consistency, optimizing labor allocation, and minimizing mistakes.

Importance of Planning Ahead

How many times have you been stuck at a red light with no other cars around you wishing someone had better programmed the system to minimize waiting time? While some traffic lights might have a simple system where each light lasts a determined amount of time, others might use a combination of sensors to either detect when a car is waiting or even if other cars are approaching.

Sophisticated light controls might even be able to forecast where cars will be arriving from or what direction has most cars waiting. Using this type of complex logic improves car flow and reduces average travel time.

Simulation Optimizes WMS

Much like traffic lights, WMS has a huge array of combinations and logic controls which can be tweaked to improve efficiency. However, increasing degrees of complexity will incur higher costs. In addition, unless the system has been previously tested in the desired environment, it might bring the opposite effect of that desired: a decrease in efficiency and productivity.

There are 2 main ways in which a company can ensure the success of the WMS: trial and error or simulation. Since trial and error is costly and inefficient, simulation is a more effective approach for testing the effect of different logics, prior to WMS implementation. It can be used to ensure the WMS will perform as desired prior to committing a large investment.

"Playing" with WMS System Logic

Some examples of WMS system aspects which can be experimented with simulation:

- Assignments of pickers, AGVs, conveyors or automated storage/retrieval systems
- Control by WMS (where user has some/all/no control)
- Testing variation

This testing can provide a valuable analysis on storage and resource efficiency, enabling the user to decide on how the system will work best, maximizing the ROI on the new system.

Learn to Unlock Operational Efficiency

In 2025, the world's population is expected to reach 8 billion people. How can our agriculture systems and ag-related industries scale up to satisfy demand at that level?

By **increasing operational efficiency** and doing more with less resources.

By **reducing waste** in our processes (wasted time, wasted money, wasted input materials, wasted motion, wasted transportation).

By **embracing technology** such as automation, sensors, big data, simulation, and optimization.

By **engaging employees** because you'll need them to work smarter and harder alongside the technology that will inevitably be introduced. Plus, there is no downside to being a great leader.

This training program teaches you to use the modern techniques of Operational Engineering, known as LEAN and Continuous Process Improvement (CPI), to unlock operational efficiency within your organization. We provide you with hands-on learning so that you are confident using LEAN and CPI principles in your work and are excited to implement and share these concepts with coworkers.

> Explains concepts, then motivates you to apply them on a real problem
> **Milind Makwana**

> Brought more of my team members the second time around
> **Bart Walker**

The Unlocking Operational Efficiency (UOE) Level I Modules are offered this September both in **Santa Cruz** (Tuesday 5th, 12th, 19th, & 26th), and in **Arroyo Grande** (Wednesday 6th, 13th, 20th, & 27th).

> It's a must to attend seminars
> **Julio Lopez**

For more information, please email us at UOE@ReduceOR.com

Module 1: Get to Root Cause

Module 2: Organize Your Workspace

Module 3: See the Process

Module 4: Eliminate Waste

> Highly recommend the seminars
> **Jordan Marcellus**

Contact Us

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Processes + People DRIVE Performance