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To optimize the effectiveness of our Improvement efforts, it's important that we begin with a thorough understanding of both the situations we're trying to improve as well as our own thinking and decision-making processes. But these tasks are not always easy.

To help keep on track, this article shares four approaches for gathering well-grounded knowledge about current situations along with five proven methods for "noticing" our own thinking processes so that we avoid biases, habits, and untested assumptions…

Mary Jane Conway-King

Know Thyself

by: Sheila Julien, Senior Associate

The quality of the output of any process is determined by two things:

- the quality of the *input* to the process and
- the quality and reliability of the process of converting the input to the desired output.

Shortcomings in either of these will result in poor quality output. In this regard, the Continuous Improvement process is like any other process: the desired output, i.e., meaningful and lasting improvements, is produced when high quality information about the current reality is studied and analyzed by a systematic thinking process unencumbered by preconceptions, untested assumptions, and biases.

Gathering High Quality Input

Gathering the right input about the current situation is the foundational step. If we overlook important information at this step, we are unlikely to achieve a meaningful and lasting solution. We use four major types of input to produce high quality Continuous Improvement:

I. **Quantitative data about the current situation:**
How frequently does the process deliver high quality? When it fails to deliver high quality, where and how does it fail, what types of failures occur, what are the impacts of those types of failures, what factors seem highly correlated with the failures? Quantitative data about the process provides important information about how and where the process succeeds and fails.

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II. **Observations and insights from people closest to the work:** This includes the people actually doing the work and the customers and the suppliers of the work. Members of all these groups can bring unique and important perspectives about how the system is working and some ideas about how it might work better. Recipients of the output of the process (internal or external customers) can also provide a great deal of insight: what are their pain points and what do they value? Taken together, observations from people close to the work provide valuable input to the improvement process.

III. **Documentation of process flow charts or value stream maps:**
Gather a team of knowledgeable participants to compile a step-by-step understanding of how the process works, where the bottlenecks and opportunities for error take place, where the work sits waiting, where and how the work is inspected and reworked.

IV. **Direct observation with "new eyes":**
An outsider watching the process will often notice an aspect of the work or work environment that is so familiar to the people closest to the work, they no longer see or notice it. This information will not surface in interviews with people close to the work nor in process mapping. The only way to surface a full understanding of the factors influencing quality and productivity is to spend time directly observing the work.

Information about the current reality, gathered via these four methods, provides the raw material required to identify the root cause of a problem and a powerful, lasting solution to address it. Nonetheless, sometimes as we create charts and graphs and flowcharts, it feels as if we are going through the motions. Sometimes we start the process convinced that we already have the right solution in mind. Sometimes we are simply looking for information to confirm the views we began with or to convince others to endorse our solution. These are symptoms of a defect in the "processing" of the information. In order for the Continuous Improvement process to work effectively, we must not only gather quality information, but apply effective thinking processes to analyze it in ways that lead to a better understanding of the root cause(s) and potential solutions.

Processing Information into Lasting Solutions

High quality information about the current reality is necessary but *not sufficient* to produce lasting solutions. We also require systematic analysis, unencumbered by preconceptions and biases, to identify the best solution addressing the root cause(s). Some useful methods of processing some of the inputs are:

- **Systematically ask and answer** the following questions to analyze the quantitative data gathered:
    - What question is this data intended to answer?
    - What can we conclude regarding that question from this data?
    - What additional questions does this data prompt?

- **Develop a cause-and-effect fishbone diagram** with the people closest to the work and with someone who brings a "fresh set of eyes" to theorize about root causes. And then they can identify what data would test the possible causes they identified.

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- **Use the 5 Whys** to drill down from a confirmed cause to root cause(s) to avoid applying a superficial solution or 'patch' instead of a powerful and lasting solution.

- **Analyze the process flowchart** to evaluate which work steps are inspection, rework, transportation, wait time, or a gold nugget adding value. Once the waste is identified and quantified, apply the 5 Whys thinking to drill down to root causes.

- **Imagine perfection.** Take some quality time with your team to think wildly about possibilities. Use exercises, including Triz, to prompt creative thinking to broaden the set of possibilities. If the best solution isn't in the set of options a team surfaces, it cannot be selected for implementation!

Avoiding Biases, Preconceptions, and Untested Assumptions

Systematic processes, like the above list, can help us arrive at breakthrough solutions, but it is useful to also be aware of the influence of biases, preconceptions, and untested assumptions that we are all vulnerable to. In fact, some research indicates that the most analytically gifted amongst us are also the most vulnerable to the influence of our own biases and preconceptions, being mentally agile enough to explain away differences between the information the process has surfaced and their preconceptions or biases.

To identify and neutralize preconceptions and biases, start by making an effort to notice how you have arrived at a conclusion or a solution. Noticing our thinking is not as easy as it might seem. Thinking processes, like breathing, happen constantly, automatically, instinctively — so much so that we hardly notice, yet they powerfully influence our view of reality and the possibilities around us. In a commencement speech at Kenyon College in 2005, author David Foster Wallace told an anecdote about an old fish passing two young fish and asking, "How's the water?" The two young fish swim on for a bit before one of them turns to the other and asks, "What's water?" Our thinking process is like the water — so much a part of our lives that unless we make a conscious effort, we do not even notice it. The failure to notice how we are thinking empowers our biases, preconceptions, and untested assumptions to carry sway.

Here are some questions that might help you surface biases or preconceptions that could impact the quality of the thinking processes that convert the information you have gathered into a lasting breakthrough solution:

- Did you have this idea as you began your analysis of the current situation? If so, maybe your thinking process was affected by **theory-blindness**. Theory-blindness is the tendency we all have to give disproportionate weight to evidence and testimony supporting our preconception and an unconscious inclination to discount or miss entirely evidence that refutes the theory.

- Are you under the influence of the **experience trap**: "I've seen this before and here's the solution that worked before, so that's what we should do now." Often a solution that succeeded in one place at one time produces very different results when the circumstances have changed. We can work to overcome this bias to arrive at an even better solution by noticing this is at the heart of our thinking process and then examining all the ways in which

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the current situation differs and the potential implications of those differences on the solution.

- Notice the extent to which an **anchoring bias** might be influencing your views. An anchoring bias is the universal tendency to base estimates and decisions on known anchors and familiar positions. Bill Conway would warn against "using history as our chin bar". We employ the subconscious assumption that the familiar or historical has a sound rationale behind it — an assumption that can be seriously misleading. Research has shown that the anchoring bias is so powerful that people's estimates of frequency, price, distance, etc. can be significantly influenced by totally unrelated numbers they hear shortly before being asked for their estimate! (See Ariely in Predictably Irrational, and Khaneman, Thinking Fast & Slow).

- Could our judgment be influenced by the **availability bias**? The term was coined by Tversky and Khaneman to describe our tendency to base judgments on how quickly and easily something comes to mind. If an event happened recently, or if we were personally affected by a type of event, we are likely to over-estimate its frequency or importance. If we have never experienced a type of event, our bias is to underestimate its occurrence. If we are aware of this bias, and are careful to compensate for it with data, we improve our thinking process and the likelihood of arriving at a good outcome.

- Have we fallen in love with our **first idea**? We tend to have a powerful urge to stick with the first idea that comes to us, focusing on what's right about it rather than its flaws. Our attachment to our first idea can keep us from surfacing better alternatives. In his text Good Strategy/Bad Strategy, The Difference and Why It Matters, Richard Rumelt observes the same phenomenon in developing strategies. To overcome this tendency, he uses a 'virtual panel' of experts: "This panel of experts is a collection of people whose judgments I value. I use an internal mental dialogue with them to both critique my ideas and stimulate new ones. The panel of experts trick works because we are adept at recognizing and comprehending well-integrated human personalities. Thinking through how a particular well-remembered expert might respond to a problem can be a richer source of criticism and advice than abstract theories or frameworks." In a similar vein, Eliyahu Goldratt, in It's Not Luck, suggests bringing our new idea to our organization's naysayer — the person who has a knack for identifying what's wrong with any new idea. We can use this input to help us get from our initial flawed idea to a new and better version of it. In either of these methods, the act of explicitly trying to identify the flaws in your thinking can act as a springboard to a new and better idea

As we work through the improvement process, we will be most successful if we carefully and objectively evaluate and continually improve the thinking processes we use to convert the facts and data into the best solution. Rumelt suggests that to improve our thinking processes, we should write down our assumptions, the thinking process we went through, the people consulted — and then go back and study to what extent the results bore out our expectations — a version of **Deming's Plan-Do-Study-Act cycle**. By noticing and studying our own thinking process and objectively documenting both our expectations and subsequent results, we can continually improve our ability to effectively process information into lasting solutions.