

Quality and Human Error – A New Tool

“Human error is just the cost of doing business.”

That’s an unacceptable answer. It’s unacceptable on both sides of the balance sheet – both from the cost of goods sold and from the human cost in terms of time, energy, injury and death. Luckily, not all subscribe to the “cost of doing business” notion and tremendous advances have been made in reducing the *opportunity* for human error. Quality programs such as Six Sigma, Lean, and other approaches have been very successful in reducing variation, waste, and unnecessary inventory. For the most part, these programs rigorously look at the business and attempt to minimize the introduction of individual human error by removing humans from the process wherever possible, and idiot-proofing those processes where humans must be involved. Sometimes these programs are successful, sometimes not, and occasionally, the people involved actually resist, revolt against, or occasionally, sabotage those processes because they see the over-proceduralization as depriving them of the opportunity for creativity or meaningful input. Those pesky humans.

Despite recent negative press¹ Six Sigma has a history of proven results that should not be ignored. The problems arise after all the low and medium hanging fruit has been picked and ROI drops for ever more complex (or dubious) projects leading to management skepticism and employee frustration. Businesses begin looking for the Next Big Thing. Here it is. The standard Six Sigma equation looks like this:

$$Y = f(X) + \epsilon$$

Where Y is the output of the process, X is the inputs (subject to their own variance issues) and ϵ represents error – human introduced error. Procedurilization and Poka-Yoke² attempt to reduce that error to zero by minimizing individual contribution and making it “impossible” for things to be done wrong. Unfortunately, these methods have failed to achieve the zero error state: solvents are used in place of lubricants, patients undergo operations intended for someone else, and satellites are dropped during repositioning because another work group has borrowed the retention bolts.³ Now comes the Global War on Error[®] (GWOE) offering new hope to Six Sigma practitioners. It is a unique way to attack the error portion of the equation by concentrating on the

¹ The June 11, 2007 issue of Business Week carried two articles indicating that Six Sigma, and Six Sigma projects were losing their sheen among some formerly ardent admirers – see “Six Sigma: So Yesterday” and “At 3M, A Struggle Between Efficiency And Creativity.”

² Poka-Yoke is error-proofing; making it impossible to do something incorrectly. For example, automobile gas caps are now routinely tethered in place to make them impossible to lose. Fuel pump nozzles and gas tank openings were sized to make it impossible to put leaded gas into a car with a catalytic converter. Even so, gas caps are routinely lost and numerous catalytic converters were rendered useless by leaded fuel.

³ Should we document each of these?

human aspect of the error – and it supports rather than supplants Six Sigma methodology.

At the core of Six Sigma one finds DMAIC – Define, Measure, Analyze, Improve, Control – all projects are built around this. GWOE uses this methodology at an individual level, educating and empowering employees to identify and reduce their own individual error patterns. Before you accuse GWOE of heresy by applying Six Sigma methodologies to a population of one (N=1), consider this: if we look at an individual and measure his or her errors over time, we find where the number of data points is far greater than one. Additionally, we can determine that the type of error and error precursors follow patterns unique to the individual. Intuitively you know this already. There are some “mistakes” (errors) that you make all the time: misplacing the TV remote, losing your glasses, sending emails without the attachments, and calling your spouse by your paramour’s name for example. How would DMAIC work on an individual level?

Define – there are numerous taxonomies available for errors. As the Department of Defense seems to be increasingly accepting of Shappell and Weigmann’s Human Factors Analysis and Classification System (HFACS), we’ll use it as a backdrop. The salient portions are:

Measure – this is where things get a little testy. As Dr. Tony Kern⁴ has pointed out, in high achievers, individual weakness and human error are secret and sacred ground. Self-analysis can be tough to do. Deep down inside all of us there are things we’re not terribly proud of; things that we wouldn’t be that happy to face or to admit. However, as Jim Collins puts it in *Good to Great*, in order to improve, you need to “confront the most brutal facts of your current reality, whatever they might be.”⁵ Collins also make the point that *at the same time*, you need to “Retain faith that you will prevail in the end, regardless of the difficulties.”⁶ Accept that it will be difficult, and persevere.

Data collection must be done at the individual level and confidentiality is paramount. So, what is measured, and how is it done? Individuals are provided with either electronic or paper versions (for the luddites among us) of an “error log.” Each day they record their own errors, big and small and begin building their error database. Experience has shown that progress is slow initially until users become accustomed to viewing their activities through this lens, but participants readily acclimate.⁷

⁴ Did you put this in writing anywhere that I should reference?

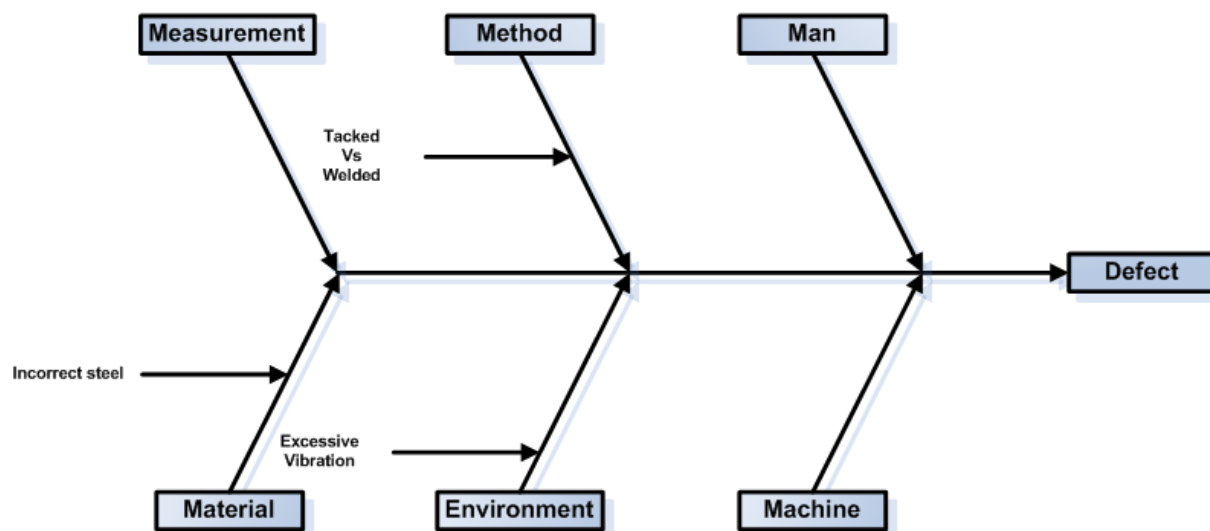
⁵ Collins, James C., *Good to Great: why some companies make the leap...and others don’t*, HarperCollins Publishers Inc., 2001, p 86.

⁶ *Ibid*, p 86. Collins refers to this as the Stockdale Paradox.

⁷ Some individuals can be expected to refuse to participate, or to claim to be participating. In a competitive environment, the truth will soon become apparent as individual performance improves.

Analyze - Employees should be trained in the methodology and equipped with the tools and then allowed to confidentially collect their own data and analyze it away from public (or board room) scrutiny⁸. Within the GWOE methodology, analysis is concentrated on error precursors (Error Producing Conditions or EPCs), professional discipline and diligence matters (Violation Producing Conditions or VPCs), attitudinal factors (Hazardous Attitudes), and situational factors. Analysis is facilitated by using another familiar Six Sigma tool: the fishbone diagram. A standard Six Sigma fishbone might look like this:

Traditional 6σ Cause and Effect Fishbone

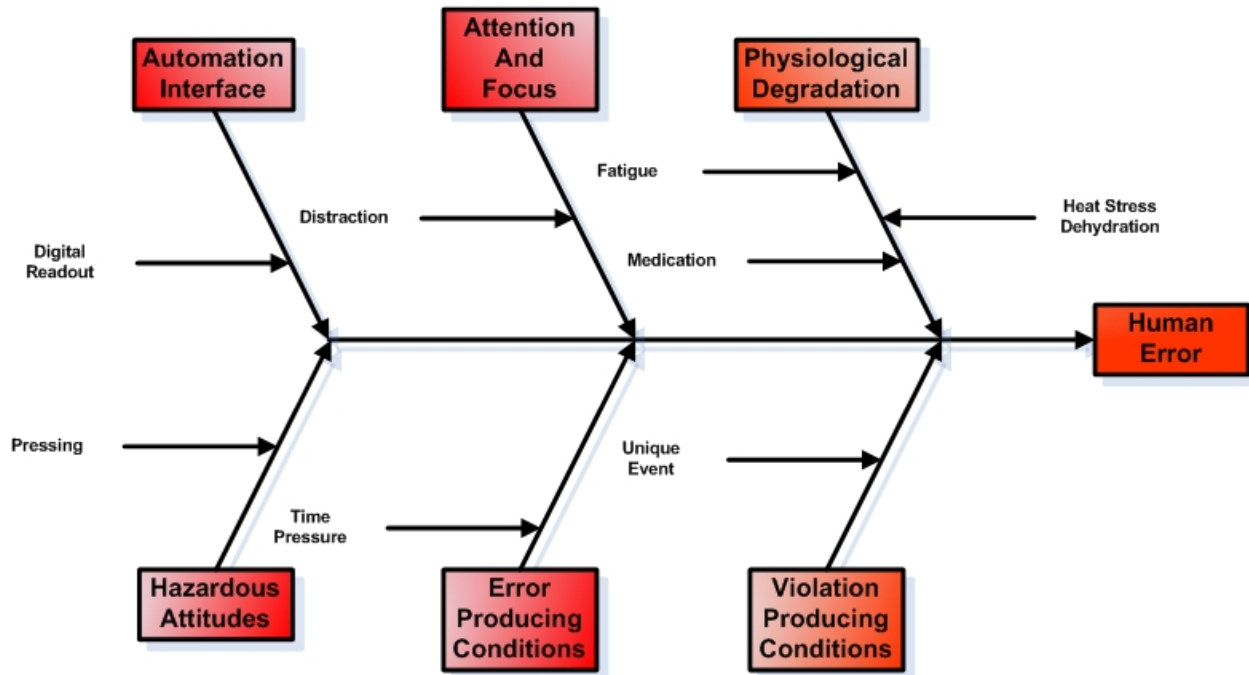


In the Global War on Error, emphasis and focus is put on a single “bone” – Man. From a GWOE view, a second-level, deeper look fishbone diagram might appear as follows:⁹

⁸ As altruistic (or voyeuristic) as you may be, there are numerous things about others that you truly don’t want to know.

⁹ This diagram is shown for example purposes only and should not be considered complete or totally compliant with GWOE methodology.

GWOE Second Level Cause and Effect Fishbone

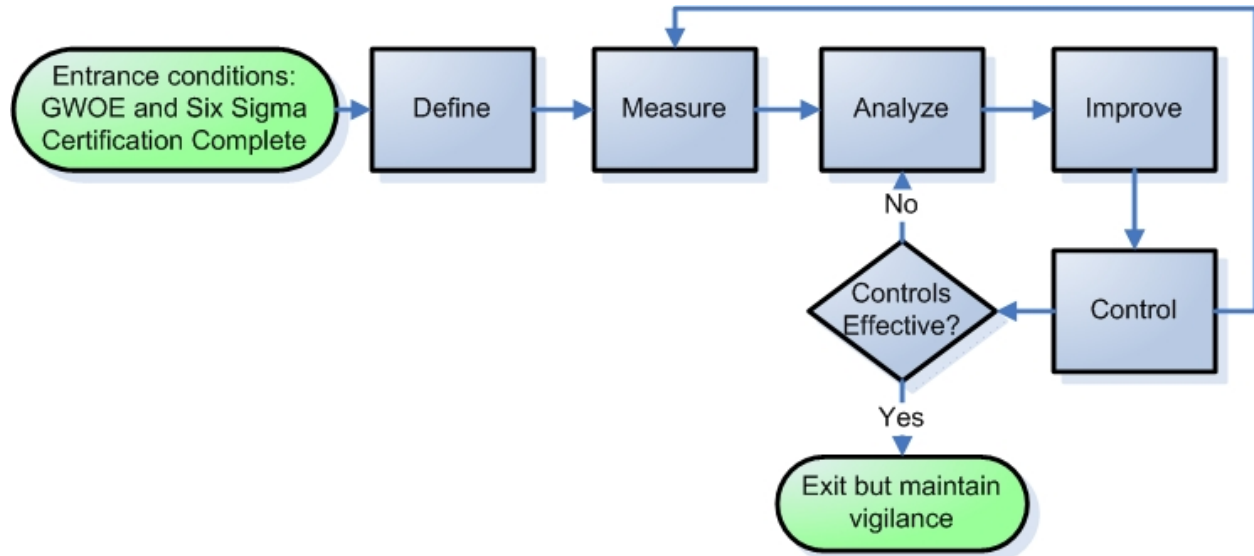


As analysis proceeds, patterns begin to emerge that lead to the next Sigma step – improvement.

Improve – In this phase, the individual’s training within the GWOE taxonomy and analysis methodology becomes key, as they will be responsible for designing their own improvement or intervention strategies. Assistance is readily available, both on a confidential level through the vendor, or may be added to the human resource or Six Sigma department’s offerings at a corporate level. Some errors are common and are readily addressed through a standard improvement strategy. For example, you discover that in the past 6 months you’ve managed to send twelve emails without the intended attachment. The cost of this error is generally measured in time – time spent fixing the mistake and the embarrassment of dealing with 42 replies saying “Can you send the attachment this time?” A standard improvement strategy for this would be a change in your habit pattern as follows: Step 1 – address the email, Step 2 – type the subject of the email, Step 3 – attach the required file, Step 4 – write the body text of the email, Step 5 – send the email. Most email users write the body text of the email before adding the attachment, then, feeling satisfied with a message well written, hit “send” without ever including the attachment. GWOE holds the development and maintenance of personal, professional and corporate habits of excellence as a key to success.

Control – this ties back to both measurement and analysis. Is the decrease being sustained? Are error patterns changing? Error patterns, like the people they inhabit, change with age – the mistakes you make now differ from those you made in adolescence and will differ from those you will make ten years from now. Vigilance and control must be maintained.

From a process chart perspective, the GWOE process fits nicely into a somewhat standard representation of the DMAIC process:



“It’s the organization, stupid.” Some practitioners of quality programs believe that all human error problems are organization problems. Fix the organization and you fix the humans. They insist that layer upon layer of protection and procedure be piled upon the organization and its individuals in an attempt to protect both the people and the product. Some organizations take this to an almost ludicrous extreme to the point that people within organization are distrusted and viewed as threats. GWOE believes that if you help people improve their performance, you end up with a higher quality product and happier people.