The United Quality Management Institute
Promoting PEOPLE – PROCESS – PERFORMANCE Skills

Looking For True Cause: At An Experiential Level – Part One of Three

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PART ONE: The Need For DATA

The following article is from my life journal in the earliest stage of my career. At that time, over 50 years ago, I had accepted a position as the quality and testing laboratory manager for a small textile company. At that time, technology had not yet caught up with that particular industry. Statistical Process Control (Control Charting) was not the norm. Even then, we created charts manually. Calculating standard deviation and creating X-bar R Chats was a long painful process and few managers were believers that they provided any value. Calculators were large, cumbersome and slow. No laptops or computers (they were large computers using punch cards). In general, data analysis was slow and difficult. Being new to the position, I was eager to demonstrate would could be done using more advanced techniques. However, I had a large lesson to learn regarding People.

Every day, my lab technicians collected samples, conducted test and generated very simplistic Out of Control reports. These reports were given to department managers, who then in turn passed them on to maintenance to conduct some form of corrective action. Follow up testing was then performed to determine if their efforts were successful. As I began to study the testing process, I noticed a few items of concern.

The first item dealt with the record keeping component. How did we ensure follow up since the lab did not keep any duplicate record of defective machinery? So, we quickly added a formal document trail with protocol. Believe it or not, this was not easy. Remember, technology had not caught up. We had only one copy machine in the entire company. Any duplicate records had to be made using carbon paper. Yes, this was very old school, but it worked!

The second item was much more complicated. It would deal with obtaining the findings of the maintenance personnel. What had they found? What type of corrective work was performed? This sounds simple; except for one problem. People were afraid to share their knowledge. Knowledge gained from their life long experience provided them with the comfort of security, power and control. It was thought that if they were the SME's, then no one would or could replace them. After all, Standard Work or One Point Lessons were only for large companies. Information was passed on by word of mouth. Unfortunately, once these individuals left, retired or passed away, the company lost their entire knowledge base. I saw that scenario repeated in many other larger companies even later in my career. So, my efforts to capture the solutions to my machinery problems became a challenge to gather.

So, let's discuss the first issue. In the area of data, we needed a simple but effective method to collect the data. Data would be recorded based upon the non-conformance found during testing. A simple form, with data collected by maintenance and recorded by the laboratory technicians.

The type of information requested was very simple.

1. Machine or Process
2. Day/Date/Time/Shift
3. Actual Test Data
4. Acceptable Test Data
5. Investigator Name
6. Investigators Observation
7. Corrective Action Performed

In order to capture items six and seven, we had to gain the trust of the maintenance personnel. They had to believe that their jobs would not be at risk by sharing their knowledge. We tried many approaches to solve this problem. These included anything from work based teams, quality circles, pay incentives and many other approaches. The one technique that seemed the most effective was when we included the maintenance personnel in the development of our training program that was targeted to teach machine operators to perform basic machine maintenance (Total Productive Maintenance - TPM) and minor repair. This would free the maintenance personnel for more complicated tasks.

Events would be recorded by maintenance as relates to unusual observations or changes. This became the first of what would later be called Event Logs. The event log could note anything deemed important by maintenance and provided a method to record observations or changes that may become valuable at a later date. An example of an event would be items such as weather (was it raining), temperature and humidity. Did those events relate unusual running conditions? The event log helped us correlate and understand events and their effects. Examples were items such as the relationship between relative humidity and ends down levels.

By analyzing the Out of Control Database, we are able to readily identify which problems were chronic, and what solutions seemed to be more effective and sustainable. Additionally, we learned from the Event Log, which factors had a predictable and measureable impact on the process. However, we were still missing the component of prevention before the fact. All of our knowledge came from the fact that we were learning from our mistakes as to which factors were important to identify and control from the Event Log.

Lessons Learned

Data collection need not be expensive or complicated, just simple and effective. There is a tendency for continuous improvement to stall because people are waiting for technology to solve their problem. There is a saying that states "Creativity Before Capital". A statement that we are well advised to follow. In addition, we tend to look for "new" ways to address improvement. The reality is that new buzz words are not the solution, but rather learning to utilize those well established techniques that we have on hand first. Consider the works of Genrikh Saulovich Altshuller and his creation of TRIZ. It operates on the idea that someone, somewhere, likely came up with a solution for the challenge you currently face or something similar. Another guiding principle is that contradictions should not be accepted, but rather resolved.

Over time, technology has evolved that allows for easier analysis of the data base including tools such as SPC. A footnote worth mentioning; During my tenure both as a working engineer and time in academia I noticed a tendency for those involved in the analysis of the database to become distant to the process. In other words, people tend to pay more attention to the details when they are required to be in contact with the process rather than only monitor data from the process. Some of this is due to advances in technology, such as on-line monitoring, that will automatically test and create reports thus removing the human observation and input. However, it also creates an environment where people may ignore the warning signs that a problem actually exists. Note to me: This is why I am always concerned when students use terms such as "outlier" or "noise". Don't ignore data just because you can't explain it. It occurred for a reason!

Where are You? One of my supervisors (thank you, Maurice) from many years ago had a habit of asking me some routine questions. I wanted to share these:

- How is Quality today? Answer, you have to define quality.

Rate Yourself:

1. We have Poor Quality and we don't know why we have Poor Quality.
2. We have Poor Quality, but don't know what to do to achieve Good Quality.
3. We have Good Quality, but don't know why we have Good Quality. (just got lucky)
4. We have Good Quality and know why we have Good Quality. (we truly understand Cause & Effect)