

Digging Deeper for Root Causes

Root cause analysis is a somewhat arcane specialization within the quality body of knowledge, and some quality professionals are understandably wary of this particular methodology since it can be used in ways that lack rigor.

As a discipline, root cause analysis has its origins in the nuclear branch of the United States Navy, when Admiral Rickover set a high standard of performance for operational systems and personnel. Most of the early root cause analysis methods were developed through collaboration between nuclear Navy personnel and staff at the Atomic Energy Commission who were concerned with the design, operation, maintenance and fueling of naval nuclear reactors.

As a result of the Three Mile Island incident and the review of research reactor operations at the national laboratories, root cause analysis methods became more widespread within the nuclear industry and at government nuclear weapons and research facilities. Most of the publications and training in the field of root cause analysis currently in use are written by former nuclear quality assurance personnel, such as Dean Gano, Max Ammerman, and Mark Paradies.

Safety professionals in the field of accident investigation quickly found that the root cause analysis methods developed by the Navy and the Atomic Energy Commission were very effective in analyzing specific accidents. Root cause analysis began to creep beyond the field of nuclear operations into the general body of knowledge used by health and safety professionals. As ASQ members in the Energy and Environmental Division began examining opportunities for integrating quality, environmental, health, and safety practices, root cause analysis soon emerged as one of the common methods that can benefit all of these professions.

More recently, the Joint Commission for Accreditation of Health Care Organizations, has recommended the use of root cause analysis methods for the analysis of significant quality failures (called sentinel events) in hospitals and other health care settings.

WHAT IS ROOT CAUSE ANALYSIS?

Root Cause Analysis is a questioning process that provides a structured method to enable people to recognize and discuss the underlying beliefs and practices in an organization that result in poor quality.

A root cause is the most basic causal factor, or factors, which, if corrected or removed, will prevent recurrence of a situation. There is honest disagreement as to whether or not an error can be attributed to a single root cause (something that has the absolute effect of a light switch) or whether there will be a cluster of root causes. This may depend on the taxonomy of root cause definitions adopted by an organization. The methods of inquiry that constitute root cause analysis are useful for both the diagnosis

and prevention of quality, environmental, health and safety problems.

What some practitioners are reluctant to admit is that root causes reside in the values and beliefs of an organization. Until the analysis moves to this level, it has not begun to grapple with root causes. An appropriate rule of thumb for knowing how deep to dig in conducting a root cause analysis is to dig until you reach the point of admitting something that is really embarrassing about the organization, but not to go so far that you are in the field of theology. **In other words, we should focus on studying the systems we use to manage an organization and the beliefs and behaviors that shape these management systems, but we should not drift into attempts to answer questions about humanity's place in the universe.**

TAXONOMIES OF ROOT CAUSE

Effective root cause analysis requires both the use of a variety of methodologies and the adoption of a taxonomy of root causes that digs deep enough to foster discussion about the real root causes of problems.

A taxonomy is a method for organizing and classifying information. Biology students are accustomed to learning taxonomies of organisms. A body of knowledge, such as quality, is often organized by a taxonomy that seeks to identify major categories.

The immediate benefit of having a taxonomy of root causes is that it helps in identifying the end-point in the questioning process and allows organizations to tally the number of times that problems occur in a specific root cause area.

If the taxonomy of root causes is organized around observations that are not truly root causes, then the questioning process may be prematurely ended and the organization may continue to suffer from the un-named root cause. Many organizations currently employ taxonomies that describe root cause categories in terms of inadequate control of management systems, inadequate training, inadequate use of procedures, inadequate communications and other categorizations.

None of these are actual root cause categories. Constructing and conducting a root cause analysis process that truncates the inquiry at these levels is misleading and poorly serves organizations that are in need of critical feedback in order to survive.

The author worked in one organization that religiously conducted root cause analysis of all major and minor reportable occurrences in preparation for regulation by the Nuclear Regulatory Commission. A team was charged with conducting root cause analysis and tracking and trending the categories of root cause of the facility's events. After over a year of analysis, the team found that the majority of events were in the category of inadequate management oversight. After all of the analysis, the team concluded that the evidence supported Deming's observation that most of the problems are management controllable. At no time did the process lead to a meaningful discussion of the root causes – the values and beliefs embedded in the

organization that “justified” and reinforced the behavior of management. Thousands of hours of analysis revealed what every quality professional already knew – the majority of problems are embedded in the manner in which management decides to operate the organization, and management’s operational decisions are based on a set of prevalent beliefs within an organization. So what does this understanding lead us to do next?

In order to enable organizations to dig more deeply, and to dig more bravely, a new taxonomy of root causes would be useful. A new taxonomy should focus on the management issues that people will discuss until a post mortem of an organization is being conducted.

A NEW TAXONOMY OF ROOT CAUSES

The author has tested a new taxonomy of root causes with quality professionals at the American Society for Quality’s 2002 ISO 9000/14000 conference and in the Health Care track the American Society for Quality’s 2002 Annual Quality Congress. As a result of encouraging responses from peers in the quality profession, it is now possible to advance a new taxonomy of root causes for wider critique among quality professionals. The purpose of this taxonomy is to drive the process of critical thinking to deeper levels within organizations that purport to practice root cause analytical thinking. This taxonomy seeks to unearth the truly fundamental problems with management systems in any organizational setting.

This new taxonomy of root causes categorizes root causes into seven belief systems, any one of which can create extreme dysfunctionality in a management system. Until management recognizes its belief system and understands how these beliefs create dysfunctional behaviors, and embarks on a journey to develop new beliefs and behaviors based on the quality body of knowledge, it cannot extract itself from its quandary.

A New Taxonomy:

1. Placing budgetary considerations ahead of quality.
2. Placing schedule considerations ahead of quality.
3. Placing political considerations ahead of quality.
4. Arrogance.
5. Fundamental lack of knowledge, research, or education.
6. A pervasive belief in entitlement.
7. Autocratic behaviors, resulting in endullment.

1. Placing budgetary considerations ahead of quality.

In this root cause category, management does not understand the fundamental concept of the cost of quality, as defined by Crosby and Gryna. Obtaining quality in performance and service is still viewed as an expense, rather the sine qua non for profitability. Key decisions are made based on accounting principles that do not recognize the concept of the cost of quality. Many in the quality profession have been highly successful in implementing methods, such as statistical tools and project teams, only to witness overall failure of the management system due to a lack of understanding of the economics of quality among senior management which leads to a wide variety of dysfunctional behaviors that undermine quality, environmental, health, and safety performance.

2. Placing schedule considerations head of quality.

Many organizations do not believe they can make the time to do things right the first time, although they will spend a great deal of time on re-work and responding to customer complaints. Many organizations succumb to meeting deadlines, even when they know they are not providing a quality product or service. When quality processes are in place, schedules will be met. Being schedule driven causes quality problems to be ignored, inevitably leading to an inability to meet schedules. This, in turn, ultimately drives up the cost of products and services since there will be penalties, lost sales, and rework caused by missing schedules.

Unfortunately, this root cause has been encouraged by national consultants who have advised organizations to move hastily and to not take the time for adequate planning and assurance of quality. "Ready, fire, aim" has been the practice of troubled organizations, along with the equally inane slogan of "faster, better, cheaper."

3. Placing political considerations ahead of quality.

In some organizations it is not possible to discuss problems that may exist. Mentioning a problem can be a career limiting move. Sometimes this is because acknowledgement of the problem will reveal that past efforts to fix the problem have been unsuccessful. In some cases, an important person will be offended if the problem is discussed, so it is ignored. In other cases, a problem is well recognized within an organization, but is kept hidden so that clients, customers, or the general public will not learn about and possibly develop a bad impression of the organization.

All of this flies in the face of Deming's admonition to drive fear out of the organization. It is the antithesis of good internal auditing. However, people who have the courage to talk about problems are then labeled as whistle blowers and are often punished in both overt and subtle ways. When political considerations rule, problems fester and grow. Loyal employees can become disillusioned and leave.

4. Arrogance

Our organization is made up of the best minds in our field. We've graduated from the top universities. We are surgeons. We are physicists. We are the largest company in this field. We've been in this business for over 100 years. We have top level security clearances. We invented this technology. We hold more patents than any other company. We have the top scholars in the field. We ride in private jets. We have private boxes at big sporting events.

Once organizations begin to use these types of rationalizations to justify their actions, they are composting a soil of arrogance that will ultimately sprout significant quality, environmental, health and safety problems. Some of our nation's biggest quality failures have been due to a climate of arrogance in important organizations. Arrogance has been shown to be a root cause in medical mistakes, the crash of airplanes, and in major man-made environmental disasters.

Any organizational culture that creates an environment in which the captain, The chief surgeon, the scientist, the pilot, or the President cannot be viewed as capable of making a mistake and cannot be questioned has embraced an arrogance that will ultimately lead to disasters. The ancients named this excessive pride or self-confidence, and called it hubris.

5. Fundamental lack of knowledge, research, or education.

There is great truth in the old saying, you don't know what you don't know. In some cases, people embark on new projects without having a full understanding of what the outcomes will be, which is fine, if the lack of understanding is taken into account. When we sail into new territories and have made contingency plans for things that might go wrong, we are doing pioneering work. When we rashly embark on a journey with no consideration of the adverse consequences, we are taking unnecessary risks that can lead to significant failure.

Nowhere can this be more clearly seen than **with reactor operators conducting unauthorized experiments at the nuclear power reactor in Chernobyl in the former Soviet Union.** Groundwater contamination incidents, newly designed equipment that does not work, and new oil rigs that sink are all examples of organizational cultures that do not value knowledge and research before taking action. The principles of quality assurance – such as independent verification, testing, auditing, and calibration control - are denigrated as being unnecessary, burdensome, and anal retentive.

6. A pervasive belief in entitlement.

In some cases, management adopts a laissez-faire attitude, permitting the employees to believe they actually run the organization. Employee participation is a positive attribute, and in a few cases, employees really do own the company, which is a corporate model that works very well in a variety of settings, and does not generally lead to a belief in entitlement.

The entitlement belief system is one in which employees believe they are entitled to their jobs and their benefits due to years of service, past sacrifices, and/or past performance. They believe they should be immune to the vagrancies of market forces, the impact of new technologies, and changes in customer requirements. The entitlement mentality is sometimes associated with a union, but can be prevalent in non-union organizations, and unions do not necessarily foster a sense of entitlement. Entitlement is created by management by a failure to continually share business and performance information with the workforce, with or without a union.

When the belief in entitlement is pervasive, employees believe that no one else would want to have their job and put up with all they have to put up with. There should be raises every year, regardless of the organization's performance.

7. Autocratic leadership that has resulted in endullment.

Endullment is the condition identified by Ira Shor that is the opposite of empowerment. Shor noted that when high school students have no sense of control or involvement in what they are forced to study, they turn off, passively resist, become apathetic, fail to complete assignments, and fail to attend classes.

The same phenomena occur when management adopts an autocratic approach to decision making and does not share information with the workforce, does not provide a balanced score card or performance indicators, and does not engage the workforce in a collaborative effort to continuously improve their performance in order to secure their mutual economic well-being.

In the endullment setting, employees talk about being mushrooms – kept in the dark by management and fed manure. Many of the early efforts to develop team based organizations ran smack into the issues of autocratic leadership and the resulting sense of endullment, and stopped right there. Likewise, many attempts by quality professionals to engage the workforce in collaborative continuous improvement are fruitless until the anger and resentment regarding autocratic leadership are resolved.

DYSFUNCTIONAL CULTURES ARE SELF-PERPETUATING, FOR A WHILE

Leaders who succumb to any of these seven fundamental root causes will not want to acknowledge their problem. Organizations that are struggling with one or more of these issues are similar to the family of an alcoholic who is in denial. Everyone tip toes around the problem and will not name it. It is like having an elephant sitting in the living room that no one is willing to acknowledge.

This is why quality has been seen as a fad in many organizations. People hear the quality message and leaders embrace the quality lingo, but when quality principles and methods run into the deeply entrenched dysfunctional belief system in an organization, quality is tossed out and condemned. Managers denigrate quality concepts as a fad, and turn back to their focus on costs, schedule, political manipulation, arrogance, ignorance, entitlement, or endullment. The problem is not that quality professionals do not speak the language of senior management, but that in some organizations, senior management does not know the fundamental lessons of quality, and is not interested in learning.

The culture in any organization tends to be self-perpetuating in that managers will select people for promotion whose espoused values and visible behaviors reflect the sentiments of the managers in charge. This may account for few quality managers making it into senior management positions because in some organizations, senior management does not really believe in the quality concepts.

Root cause analysis is an essential process for any organization that wants to continue to improve and is willing to engage in serious introspection and analysis. However, we must be willing to dig deep enough to uncover and consider the beliefs and behaviors that shape an organization's management system.

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