

The Management System Dilemma

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Abstract

“It’s not me, it’s YOU! It’s not maintenance, it’s production. It’s not Americans, it’s those crazy Middle-Easterns. It’s not humans, it’s our SYSTEMS!” No matter how you look at it, we humans REFUSE to take the blame. Yet absolutely every incident, failure, problem, and disaster occurs because PEOPLE do inappropriate things!

With the above in mind, much thought has been directed at an appropriate investigative “stopping point.” Encouraged by engineers and systems-analysts, investigations seem to have been designed to focus primarily on MANAGEMENT SYSTEMS. “If we find a flaw in the SYSTEM and correct it, we’ll avoid future problems.”

But the organization that defines a precise “management system” cannot assure that everyone will follow it. After all, each person has a different UNDERSTANDING of the system. And even though it might be written-down, the management system does not cover everything – we “fill in the gaps” when something is missing. And even if nothing is missing, language is subject to interpretation. And even if we understand precisely what was meant, we often CHOOSE not to abide by the

system FOR ONE REASON OR ANOTHER.

What is the tie between people and management systems? What terminology is appropriate for explaining the tie? Do our SYSTEMS cause us to do things, or do WE cause all our problems? This paper attempts to articulate the dilemma, as well as to suggest some possible answers.

Background:

Several years ago (approximately 1992), I was a “root cause analysis” exhibitor at an IIE (Institute of Industrial Engineering) conference in Detroit, MI. Because I was captive for 3 days, I was able to talk to several distinguished professors who were pursuing the subject of “management systems.” I was extremely interested in the concept because it was “the cause of all of our problems (or so was the thinking circa 1990). Among other questions, I asked each of the professors and many of the other exhibitors: “just what do you mean by management system?”

I admit that it might not have been a fair question. Since the theme of the conference was computer simulation, computers were on everyone’s mind. But with only one exception, all the professors related management systems to computer systems, i.e., work order, planning and scheduling, inventory control, and process control SYSTEMS. The only other input I received was from a lady who had a very open-ended opinion of management system – “it’s everything that’s needed to manage a business.”

The conference left me dry and frustrated. Certainly, I had my own definition of a management system, but I had not found any collaborators in Detroit. In the ensuing years, therefore, I pursued my own understanding of management systems. Most importantly, I gradually realized that management systems are NOT the cause of all our problems.

Things were going smoothly for me (respecting my understanding of management systems) until last year, when I had a disturbing conversation with a client. This client did not approve of the direction I had taken since 1990 – especially my emphasis on “conscience.” Nor did he value the concept of “latency” (more on latency later). As an engineer, he understood systems.

Our organization is headed by engineers – black and white thinkers who expect black and white findings. We hired you to teach us how to use Root Cause Analysis to find “defects” within our systems. We don’t want you to talk about conscience, nor about latency. We thought you were going to teach us how to fix our management systems.

What is a management system?

Partially in response to that encounter, and in preparation for this paper I looked in the appendices of approximately 50 business management books, and searched the Internet for definitions. I even went back to the IIE for help.

Although this is one of the most common terms used by root cause investigators (including governmental, consulting, and practitioners), I did not

find ONE formal definition of “management system.”

Therefore, I went to the people that use the phrase and asked them to define it. In a web-based conference of 45 root cause investigators, I received many replies. The following represent the essence of the replies, and are sorted from most specific and tangible to least specific and intangible:

In modern industrial society the term "system" is often used loosely to dignify fuzzy concepts. But if it is a "system" it must be deliberate and organized. Such is life. We impoverish the language by failing to make sharp distinctions between the meaning of words. A system is any entity that has one or more inputs, processes, and outputs. A toilet is a system. So is a shuttle launch organization. A complete organizational system has suppliers, inputs, processes, outputs, customers (or clients or stakeholders or whatever), feedbacks, indicators, and constraints. A management system, even a bad one, has most of those elements.

Dr. Bill Corcoran, Organizational Learning Consultant, CT

A management system is the integration of individual actions into a common pursuit of delivering a tangible or intangible result. It requires the individuals involved to understand the relationships of their actions with others and the management system sets out that overall view. This may be documented in more complex cases or where communications are not robust.. Andrew Ward, Professional Investigator, UK

I would define a "management system" as an interdependent set of people and

routines that enact the activities directed at managing an organization. By "managing" I mean setting conditions for performance, including planning, coordinating, giving feedback, designing programs, etc. The management system is not equivalent to the activities of people labeled "managers" but should focus on activities directed at the function of managing. – John Carroll, MIT, Sloan School of Management, MA

*My definition of a "management system" is "a process for performing a task." The management system could be anything from a formal procedure developed to guide people on how to operate complex equipment, to a thought that passes through an individual's head on how to complete a simple activity.
Ron Hickman, Dupont, VA*

A management system is the work culture into which an individual hires that defines the local limits of actions and behavior. Geoff Dougal, Eastman Chemical, TN

*Frankly, I try not to use the expression because of their nonconsensual multi-meanings. Can't we conduct in-depth investigations without referring to it?
Bill Salot, Honeywell, VA*

Although the variety is fascinating, a message has emerged. Bill Corcoran set the stage by chastising our abuse of the English language. He infers that a true system is very machine-like (deliberate, organized, inputs, processes, outputs).

A search from my laptop thesaurus yielded synonyms that agree with Bill Corcoran's point of view:

System

scheme, organization, arrangement, classification, structure, co-ordination, organism; method, technique, procedure, routine, practice, usage; orderliness, regularity, method, logic

Why, then, do so many variant understandings exist? On one hand, people say a management system is similar to a machine. On the other hand, they infer it is a nebulous conglomeration of physical, human, and even spiritual facets that congeal to yield varying manifestations. The distinguished Mr. Salot is so exasperated at the "nonconsensual multi-meanings" that he won't even use the term!

Why don't investigators adhere to the correct (per Corcoran) usage of the word "system?" Are they inherently prone to sloppy vocabulary?

More likely, investigators (and others) are MAKING UP THEIR OWN DEFINITION, forcing it to include what they NEED it to include to capture what they are seeing at the depths of "failure and its causes." It is revealing to see what these investigators NEED to include in their definitions of management systems:

...a thought that passes through an individual's head on how to complete a simple activity.... Ron Hickman

It's how an individual perceives the workplace "rules" by observation of how others behave.... Geoff Dougal

It is something like a corporate culture; it develops as a result of many people's actions and behaviors and yet it is not usually well documented. So a new

employee wouldn't receive training on the management system, they would learn it through observation of others and, possibly, by making a few "mistakes" and getting feedback from someone on how it's done here. Thus the message is sent that if you want to stay and get promoted, you need to adapt to the "system". That enables this system to survive, even though there are probably many folks, that if left to their own devices, would handle things differently. Peggy Galvan, Lubrizol, OH

No management system is complete and suitable to cover all eventualities, irrelevant of how many binders it fills. To allow for variations, the "management system" allows flexibility for individuals to cope with local situations. By doing so, it allows for individual interpretation of the requirements. Therefore, the same task could be undertaken six different ways by six people who could all be working within the same management system.

Could this variation within the management framework, while still adhering to the management framework, lead to failures? From my investigations it appears they do. But worse is the fact that these flexible "systems" will not detect incompliance, leaving the adverse, unrecognized, latent situations as potential time-bombs for future events... Andrew Ward

It cannot be overemphasized – these comments are from dedicated, intense individuals in search of the “root” causes of failures they encounter. As I see it, overwhelming evidence exists that almost ALL of us are coming to the same conclusion, but are expressing it in different ways: the typical definition of

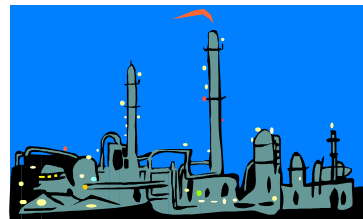
SYSTEM is too limiting for our purposes!

We don't want to limit our investigations to MERELY machine-like management systems!

Here's where it gets difficult. Although we don't want to LIMIT our investigations to “systems,” we certainly want to include systems. If the intended system is flawed, the outcomes will certainly be flawed. The important word is MERELY.

Going back to the IIE conference in Detroit, I remember sitting in my hotel room during the conference, looking out over the Detroit River. I was struggling with the concept of management system when it hit me: “Management systems do not exist! We think they do, but they don't!” In retrospect, I don't think this was quite true, but it came awfully close.

Physical systems certainly exist. We can see, hear, feel, touch, and smell them. Picture a chemical plant, with the pumps, compressors, towers, and heat exchangers. Isn't it interesting that we don't argue about the meaning of physical systems?



Management systems are different. Sure they can be documented in the form of procedures, checklists, work flow diagrams and organization charts. More recently we have even seen “mission statements” and “visions and values” plastered on our hallways. These

“official” forms of our management systems are important, because they signal the official intent of the organization.

But what’s on paper is not necessarily the same as the *“thought that passes through an individual's head on how to complete a simple activity.”* (Ron Hickman) We tend to think of the official, written management system as THE system (perhaps because of the word), whereas the REAL “system” resides within people’s heads.



....a new employee wouldn't receive training on the management system, they would learn it through observation of others and, possibly, by making a few "mistakes" and getting feedback from someone on how it's done here...Peggy Galvan

It seems we’re all saying the same thing: the only “management system” that’s ultimately pertinent is the one that lies LATENT within our heads – the one that’s invisible, intangible, and intensely personal!

The real root causes lie LATENT within us!

The word “latency” came to me in the early 90’s while working on a consulting assignment with an associate. At dinner

one evening, the associate shared an article that that used the word “latency” to talk about the root causes of failure.

At the time, I dismissed it rather quickly (as you, the reader is also likely to do). I had been using other words, and saw this new word as simply another way of saying the same thing. I had already committed myself to the concept of “management system causes.”

But the word gnawed at me. Over a period of time, I began seeing a difference between my understanding of management systems, and this new concept of latency. Admittedly, at the time I was one of the people who thought of management systems as the machine-like equivalent of physical systems. I had been treating them as perfectly predictable, surgically alterable “things,” rather than the elusive conceptual entities which they really are. Deep down I knew better, but I DID NOT HAVE A WORD to describe what I knew. Latency became that word.

Admittedly, however, the word is a bit misleading. Below, I have grouped latency’s synonyms into two categories to make a distinction between what the intended meaning IS and what it is NOT.

For Investigative Purposes,
Latency is NOT

Dormant
Inactive
Inert
Immature

Far from being dormant and inactive, latent causes are responsible for ALL failure. They are, therefore, alive, active, potent, and very mature – the

opposite of what the word might imply. In this respect, latency is a total misnomer. However,

Latency IS

Concealed
Hidden
Veiled

Because it is concealed, hidden, and veiled we often do not consider it. We must probe to find it.

Consider the Leaning Tower of Pisa. If you were born on the tower, and lived your whole life on the tower you would be subject to latent conditions which would affect all your surroundings, most of your movements, and much of your life. The “lean” causes active forces you must deal with continuously – it affects ALL you do.



Similar to the Leaning Tower is gravity. Reading about the feelings of astronauts who experience long-term weightlessness, many of them regret having to return to the confining, restraining forces of gravity – something most of us cannot relate to because we live with it all the time – and it certainly affects everything we do.

Such is life inside a chemical plant, refinery, or power station. Latent forces exist that affect all that we think, speak, and do. Certainly these latent forces are influenced by the intended, official management system. But the official

version is immediately overruled by the LATENT reality.

Imagine yourself an alien (AKA: new employee) and you've been beamed into the audience at an Opera (AKA workplace #1) and then into a WWF Smackdown wrestling match (AKA workplace #2). Your "new alien" orientation booklet contains all the usual legal mumbo jumbo and flowery beliefs; it isn't helpful. To find out what's REALLY expected at either workplace, you sit and observe the audience (your peers) for a while, and then maybe try shouting a few vulgarities yourself (hopefully at the proper event). Without any documentation, you will certainly learn what the local limits are to your actions and behavior. And I would about guarantee it would be different at each workplace.... Geoff Dougal

Into the Depths of LATENCY

Hopefully, by this time the reader will understand the management systems dilemma.

*Frankly, I try not to use the expression because of its nonconsensual multi-meanings. Can't we conduct in-depth investigations without referring to it?
Bill Salot*

Just as hopefully, the reader will accept the need for a new focus – a focus on the LATENT causes of failure. As I will show, LATENCY will INCLUDE the questioning of the “management system” (as defined by Corcoran). But it will not stop there. Latent causes address why people do what they do, WHATEVER the reasons.

The following example actually occurred in the early 90's in a west coast oil refinery. The example demonstrates the INTENT of a latency probe, as well as a means of drawing out the required information.

A steam boiler had been shut down for annual inspection and maintenance. Upon startup of the boiler, a superheater tube burst. The boiler had to be shut down immediately for further repairs.

The incident was investigated for three reasons. First, this refinery was in its initial stages of RCA implementation. It needed a quick "success story." Secondly, an RCA example was needed for a 4 hour class that was being developed for presentation to all refinery personnel to introduce the intent and vocabulary of RCA. Finally, refinery management was interested in demonstrating their commitment to AMNESTY on formal RCA's. This was their chance to prove they meant what they said.

From a review of the start-up procedure, the investigative team (4-5 people) learned that the superheater tubes ought to have been blown down prior to start-up. But through interviews, the team learned that the tubes were NOT blown down.

The blow-down process is intended to remove any condensate from low spots in the tubes. Un-removed condensate would block normal steam-flow through the tubes, resulting in extreme hot spots in the tube material. Hot spots would result in a drastic reduction in material strength. Under normal steam pressures, therefore, the tube could burst because

of its lower strength. This IS what happened during this incident.

Further interviews revealed that two specific operators decided not to blow-down the tubes, even though they were told to blow them down, and even though the instruction was in the start-up procedure.

The investigative team forwarded this information to management (as required at the time) prior to pursuing the latent causes. Although management wanted to demonstrate their commitment to amnesty (and latency), they were a bit leery. The investigative team anxiously awaited the decision of management – would they stick to their intent to declare amnesty, or would they lash out at these two operators?

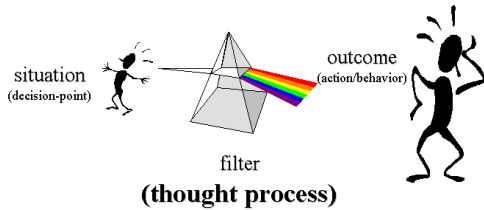
Fortunately, management gave approval for a "latency probe." They declared amnesty, "no matter what we find, as long as no-one broke the civil law, or as long as everyone tells the truth. We want to know the latent causes of this incident."

Situation – Filter – Outcome

Per investigative procedure, the team was required to assemble the 2 operators, the foreman in charge, and the area manager. Union representatives were also in attendance. People were a bit tense, but not as tense as usual because of the promise of amnesty.

The lead investigator had been trained in the use of the Situation-Filter-Outcome Model, which explains human behavior in terms of a triggering situation, followed by a filtering (or thought)

process, ending in a particular outcome (behavior).



Per procedure, the lead investigator initially tried to understand the SITUATION that lead to the incident, i.e., what combination of circumstances presented themselves to the “culprit” which eventually lead to the incident?

The following was revealed though dialogue:

We were out in the field, near the boiler, at about 1:00 PM (after lunch). The foreman came over to us, where we were standing, and told us to blow down the tubes. We'd never met the foreman before – we were temporarily assigned operators. We never saw a written procedure.

Next, the investigator focused on the operator's filtering (thought) process, i.e., what actual thoughts were going through your mind in response to the situation?

This foreman scares me. He looks like he'd bite off my head if I asked a question.

But I guess we ought to blow-down these tubes.

Where's the blow-down line? Up there? There's no room to do anything on that small, 2'x2' platform. I'd get 200 degree water all over me if I tried!

Why do we need to blow it down, anyway?

We're often asked to do things that don't seem necessary just to keep us busy – this is probably one of those things.

In essence, these operators were thinking:

*The foreman scares me.
I don't know how to do this!
This will probably hurt me!
They don't really need it to be done anyway!*

If the investigator does his job correctly, all present would say at this point: “I'd have done the same thing if I were those operators.”

Knowing what the “culprits” were THINKING is the first step of the latency probe. As investigators, we are not to JUDGE what they were thinking. All we need to do is UNDERSTAND what they were thinking. Their actual thoughts are called “Tactical Latent Causes.” The second, more important part of the latency probe follows.

Per procedure, the lead investigator shifted his focus to “management” – in this case the foreman and area manager. Both these gentlemen were present when the operators were questioned. In fact, management challenged their thinking, wondering aloud if they were only making excuses. But through careful intervention and probing, the lead investigator brought everyone to agree that the operators were telling the truth.

To divulge the “Strategic Latent Causes,” the lead investigator reviewed

the “essence” of the operator’s thoughts....

*The foreman scares me.
I don’t know how to do this!
This will probably hurt me!
They don’t really need it to be done
anyway!*

and then asked management:

*What about the way you do business
contributed to these thoughts?*

By focusing on each thought, one thought at a time, the foreman and manager agreed that the following were true:

We scared the new operators.

We asked the operators to do something they had never been trained to do.

We asked the operators to do something which would have resulted in an unsafe condition.

We have given these operators the impression that much of their work is meaningless.

We had not encouraged the operators to express concerns.

Please note that this dialogue occurred over a period of hours. Although the words above look rather antiseptic, the real-life encounter was somewhat painful. Emotions soared. People defended themselves. Finger-pointing erupted. After the venting, however, the operators agreed they should have told someone they didn’t blow down the tubes. On the other hand, management

admitted their heavy role in contributing to the incident.

Changes were made in the training process – a direct fix of a management system (per Corcoran). The 2’ x 2’ platform was enlarged (not part of any management system as far as I can tell), and more attention was given to temporarily assigned personnel (again, not any specific fix on a specific system).

Most importantly, the people involved became aware of how important it is to communicate with one another in an open, friendly, and supportive manner.

The Goal of the Latency Probe is “Repetitive Challenge”

One of the examples I use in the RCA classes I teach came from a personal incident. One of my vehicles caught fire. My wife was driving the vehicle at the time. Although it was a minor incident, it could have been catastrophic.

It was a classic. Plenty of eye-witnesses were available (fire department, tow truck driver, and others), engine components had been burned, and vehicle maintenance records were available. I assembled all this actual evidence for the class to use in their classroom investigation.

When the class used the situation-filter-outcome model to probe Latent Causes within ME, I decided to “lead by example,” and shared a little about myself and my habits.

Sure it was only a class, but it was uncomfortable nevertheless. The class

tried to help me see some things about myself that needed to change.

I must admit, I was a bit offended at the findings of that first class. I passed it off as only a classroom exercise. Sixty (60) classes later, however, each pointing to the same “attitudes, beliefs, and assumptions about life” that need to change, I’ve begun to listen! Through the personal experience of this classroom exercise, I learned something KEY to addressing Latent Causes:

They won’t believe you the first time – it takes repetitive challenges!

To help emphasize this point, the following is an e-mail I received in October, 2000 from a former class attendee.

It was your example of the fire in your car’s heater box that opened my eyes. I realized that you were the reason for the fire! You rationalized too much, and didn’t pay enough attention to small warning signs. You also didn’t pay enough attention to your wife when she told you of the warning signs. Maybe it was because I could relate to your situation in my own life, maybe it was because it was a personal example, maybe it was because you risked some embarrassment by bringing up the example and I admired that, maybe because it was an easy example to follow – whatever the reason I bought into your concept of Latency then and decided to use it.

After 4 or 5 root cause analyses on site, the problems with our organization became clearer and clearer. I still remember the light bulb coming on in my bosses head during a meeting where,

once again, our practice of thinly staffing during a start-up/shutdown was at the bottom of another problem. It took 4 or 5 times, but then he made a statement in front of a room full of people that he would “never let that happen again.” And he didn’t!

Now I lead by example. I have seen less corner-cutting from the rest of my people over the months and years. I have actually seen other operators step up and discourage their peers from doing it without giving any more reason than “we don’t do that anymore!”

Latency is where it’s at. Keep it up, it makes all the difference in the world.”

In conclusion

Perhaps the most important goal of any investigation is to go beyond where we’ve ever gone before. By focusing on management SYSTEMS, we often fall far short of that goal. We can come closer to the goal by shifting our emphases to the LATENT causes within us.

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