Machines Don’t Have Issues - Only People Do

John Allen

“We have an issue with a leaking fuel tank, and the team is stuck. We need your help right away.” An issue about leaking gasoline? That sure sounded like a problem to me!

When I got to the client site at 10:00 PM that same night, I was tired and a little grouchy (okay, more than a little grouchy, for those of you who know me), having worked that day, taken two connecting flights and a fifty-odd mile drive on each end, eating only junk food. I needed sleep, but the people assigned to the project were stuck, they said, unable to make progress. They had to report by conference call at 7:00 AM, and were starting to panic. They wanted to meet with me immediately.

I knew the nature of the issue as soon as I walked into the conference room. At ten o’clock, there were more than twenty people sitting around. They were, for the most part, well-meaning engineers and suppliers doing their best to do what they were told: represent the best interests of their company or department. The conference table was littered with soda cans, spilt coffee, pizza boxes, and half-eaten sandwiches that were beginning to smell. I was invited to dig in, but politely declined.

I instantly knew what was wrong, not with the tank, but with the so-called team. “How many competent engineers,” I thought, “does it take to figure out why a few fuel tanks, returned
after several weeks in the field, are leaking?” Two or three seemed like a good number for this team. If they could not figure it out, then why were they on the payroll? That’s their job.

Two very good engineers had been assigned to work with this large group, but could make no progress at all. Why not? Because they were part of a committee assigned to resolve an issue, not a team organized to complete a project. The tactics were not in phase with the business strategy. And management’s interest in a fix was in conflict with the approach of a committee assigned to resolve an issue. Resolution is not a fix. A team working on a project has to have a specific, well-defined tactical approach that management understands, one that always leads to the answer. For technical projects, the approach has to be based upon the physics model I described in my article, “The Model for Solving Technical Problems.” It works every time.

I asked everyone in the room to introduce themselves. There were representatives from every supplier that provided a component or material for the tank. There were people from every department involved in purchasing, engineering and approving changes. Each saw it as his responsibility to defend his turf and make sure there was no blame for his department, company, or worse, individuals.

I then asked all but three to leave. They could head for the airport at their convenience and go home. I went back to the hotel, slept a few hours, and returned at 6:00 AM.

Twenty brilliant people cannot effectively work on a project that should be completed by two or three, especially if they have competing goals.

One of the engineers whom I asked to stay apologized for not making more progress. He didn’t have to. He had no chance, not with the rest of the people looking at this as an issue that had to be resolved by a committee, not a problem that needed to be converted to a project, then executed to a conclusion by a small, effective team.

I was not interested in resolving any issues. I don’t work on issues. This was not a complex project. It deserved answers, and fast. To get those answers, we needed a good tactical plan. Sure, some projects are complicated. That means we need to be even more disciplined at the tactical level, more focused on making certain that the project has a leader who clearly understands sound tactics, and makes sure they are integrated with the business strategy. Trying to resolve issues at the tactical level is a distraction.

By noon we had answered the following questions:

1. How is the tank supposed to function? How many functions does it perform? Which are high-risk functions? 
2. Which function is it failing to perform?
3. Where is the energy supply coming from that caused the function to fail?

By the end of the day we had:
4. Replicated the failure and proven we understood the physics of failure; and
5. Proposed tactical fixes which were consistent with the business strategy.

I left at the end of the first day, but stayed in contact with the small team that continued the work over the weekend. They implemented a temporary fix, tested a permanent fix and began
the approval process. The leader then included a few of the people who had earlier been asked to leave. The size of the team, however, was kept small by removing those no longer needed.

As the tactics changed, the people on the team changed. A good leader knows how to roll people on and off a team, keeping the team small, lean and effective, while making certain that roles and responsibilities are understood and respected. By including everyone that might be involved, instead of changing team members as the roles change, a team becomes a committee and loses focus.

I have never seen a large team assigned to a narrowly defined technical project work well in a factory that has to continue to operate. I have, however, seen small teams solve complex problems without interfering with operations. Plant managers sure like that!

The approach to solving technical problems has been corrupted by those making issues out of problems. An issue is political; a technical problem is not. There are no politics around the laws of physics. The more we politicize technical problems, the more we argue about how to resolve issues, then the further away we get from the simple laws that we use to make machines work.

(While reviewing this article with a colleague, he told me that the legal department where he works wanted to eliminate the use of the word “defect.” They already had told the engineers never to say they had a problem, only issues.)

Engineers need to be accurate and precise when they measure. When communicating, they need to be accurate and precise so their meaning is clear and actions are predictable and repeatable. Today language has been distorted to the point where a word can mean many things, or whatever you want. Thus you can obfuscate and confuse, shift blame and never accept responsibility. Engineers cannot work that way.

"Houston, we have an issue," could have meant anything had astronaut Jack Swigert said it from Apollo 13. When a fuel tank exploded, Swigert said (according to James Lovell in Apollo Expeditions to the Moon), "Houston, we've had a problem here." The ground control team knew it was serious. They responded accordingly to develop a plan, and divide the tasks into specific assignments. There was no time to discuss issues. Time was against them. That is the point. Lawyers don’t want anyone to know exactly what we mean. Issues are, by nature, a forum for arguments. Goals, once defined at the tactical level, are not. Sure, there is a reason for this. If we never admit that we have a problem, we can argue about it endlessly. But this is not a model for engineers to think their way through a technical problem.

Engineers, however, want you to know precisely what they mean. In his editorial, "Diversity is the Goal, not the Issue" in January, 2003, Washington Post syndicated columnist William Raspberry wrote,

"How can a concept like affirmative action split Americans into so many warring factions? ... My own conclusion is that virtually all of us are both for and against affirmative action. How we argue about it depends very much on whether we see diversity as a goal – or only an issue.” He goes on to say, "Issues, by their very nature, divide. They force us to take sides, to work against one another, to produce winners and losers. That is their political purpose...Goals, on the other hand, can be shared – even when we embrace different means for reaching them."
When referring to issues, is the intention to divide and polarize? Yes it is, if you are a lawyer; certainly not, if you are the engineer.

There are two sets of laws to which we are all subjected: the laws of man and the laws of physics. The laws of physics are a lot simpler than the laws of man. Issues deal with man-made laws. Technical projects deal with the laws of physics.

When given an assignment, you have to determine if the project deals with issues or a problem. They are not the same thing. The tactical approach for one will fail for the other. Solving technical problems is a lot easier than resolving issues. That being the case, why would one think in terms of issues when there is an easier, more efficient way? The foundation of technical problem solving, specifically at the engineering level, is always based upon the laws of physics.

Think about this for your next project, whether you lead the team or are a team member. It will make it a lot simpler if you can keep it out of the convoluted world of issues.

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