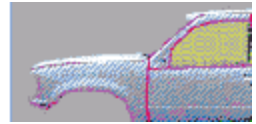


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## Quality Management: Problem Solving Through the Lean Lens

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Lean manufacturing has been surrounded by many misconceptions and myths over the past 10 years. While there are many erroneous ideas on lean, one misnomer is that it is about speed and not about problem solving. The truth is that lean is all about problem solving. It is this never-ending process of problem solving that prevents manufacturers from reaching an ideal state in which every customer's needs are met on time and with zero waste.

Most problem-solving efforts tend to focus on the output of the process. The output is measured, data analyzed and gaps found before work begins on the process. This approach has worked and will continue to work as long as the problems reflect specific trends or consistent gaps.

However, when a process is needed that is capable of identifying and solving a major failure, and also eliminating millions of individual opportunities for mistakes or errors, a different lens and approach must be taken.

### Lean lens on problems

Consider Three Mile Island, the nuclear power plant that experienced a close-to-catastrophic accident in 1979. Through extensive analysis and study, attempts to pin down one or two problems failed because the process broke down at many steps. For example, a maintenance repair tag from a switch was hanging in front of an indicator light, which led to the wrong information and, ultimately, the wrong decision. No amount of inspection, data collection, sampling or large-scale problem solving could help. A process, system and organization capable of surfacing deviations at every step were needed in this case, as well as a procedure to respond effectively to these deviations. This is one of the central tenants upon which all of lean is based.

Systems must be designed, employees skilled and cultures attuned to identifying deviations wherever they may lie and without interference by a manager who might deem the problem insignificant. This cannot be achieved only during the problem-solving phase. It must be designed into the work process, far in advance of the problem occurring. The process should be such that when a problem occurs, it is immediately identified.

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The lean lens can add value in all phases of problem solving—identifying the problem, surfacing and engaging the problem, and sustaining the solution.

### Identify the problem

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The method of choice for identifying problems too often simply allows them to find the manufacturer. This basic element of the general problem-solving progression often goes unappreciated or neglected altogether. Many problems find manufacturers after they affect the customer or monthly result. This process of solving problems as they occur is accepted as normal or satisfactory, but it is not. Additionally, this reactive approach does not allow manufacturers to solve problems strategically; often, it prevents them from reaching their goals. The problems that find manufacturers can consume so much time that the core issue and more important problems go unaddressed.

For example, take a process as plain as painting lines on the factory floor, referred to as cycle-timing marks in an assembly process. These marks help the operator see where they are in the cycle, which is often broken down in 10% increments. In most organizations, a tool such as this is underutilized because it is viewed through a traditional lens whose key purpose is to help the operator keep pace or speed up if he is running behind.

However, when viewed through a lean lens, this is not the purpose. The work should keep its own pace. The purpose of the lines is to help spot problems as they occur. If something is wrong with a task—for example, from parts that do not fit to a sluggish air motor—the lag in cycle time will be immediately identifiable, providing opportunity for quick intervention.

Another example of missing the point in problem identification often occurs through the use of the 5S tool—sift, sweep, sort, sanitize and sustain—which often is misused as the lean implementation starting point.

The correct purpose of 5S is to assist in creating an environment where problems can be quickly identified. Imagine the setup operator who needs a critical tool, but when it's time to execute the changeover, the tool cannot be found. The 30-minute changeover increases to 60. Or the inventory numbers at the end of the month rise because increasing amounts of material have been stuffed into each workstation. Or the customer experiences a failure because the operator grabbed the wrong uncalibrated torque wrench. All of these are examples of conditions that can be spotted and corrected earlier, faster and cheaper, and without negatively affecting performance through a tool such as 5S.

It is not the tool itself that is important, but rather the question, “Will the work itself identify a problem that is occurring before it creates an impact?” The lean lens allows work to be designed so that problems become visible and rise to the surface. Also needed is a culture that supports this notion and a means to deal with the problem once it is identified.

### Problem engagement

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Managers today often assume that if a problem is found, it will be dealt with. In actuality, most systems and cultures function in a way that allows the problem to select a manufacturer rather than the manufacturer select the problem. Most problems are dismissed as either as either insignificant or typical. In general, the capacity to acknowledge and solve multiple problems is limited to a handful of key people. Organizations need the capability and capacity to solve 100 times more problems than they do today. They also need a process that connects the right people to the problems. This is a major gap for most organizations.

Andon systems, which provide instant visual recognition of all machine states for those on the shop floor, is an example of a solution. However, most people focus on the physical element, the Andon cord, rather than on the process. Whether the problem is spotted by a person or a machine, the Andon process essentially raises its hand, draws attention to itself and asks for help.

The Andon process accomplishes two goals. First, it provides resources for each problem as it occurs, not after it is inspected or found through data. Second, connecting resources together creates an explicit structure and highly repetitive process for learning. By engaging in each problem in a structured way, individuals learn and are coached. Over time, this builds a massive capacity to solve problems. This capability enables people to solve millions of small problems before they become big problems.

### Sustainability

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Problem solving often is effective through the root-cause phase but fails at the point of selecting the appropriate solution. Many solutions fall into two categories of ineffectiveness—force fit and try harder.

The force-fit solution is that in which additional work, burden, complexity and review are thrown into the process to force an effective result. This solution adds waste to the process, hindering speed and efficiency, and therefore eventually will be eliminated.

The try-harder solution involves more training, coaching or incentives. This also threatens to complicate the situation. When looking through the lean lens and striving for sustainable solutions, one simple rule applies: Make the new way easier or make the old way impossible.

Problem solving is employed in every organization and is the primary tool in which stable and capable processes are created. Traditional tools and thinking will work to a point, but lean thinking can take an organization to a higher level of success. However, the key to solving more problems more efficiently is not waiting for the problem to present itself, but to design processes, organizations and cultures around finding and solving problems where they occur.  
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### sidebar: TECH TIPS

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- Lean manufacturing is about problem solving.
- Problem solving is the primary tool in which stable and capable processes are created.
- Systems must be designed so deviations can be identified, no matter where they occur in the system.
- A reactive approach does not allow manufacturers to act strategically in solving problems.

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