

MANY GURUS, ONE PROBLEM: A CASE STUDY

Hansraj J. Bajaria
Multiface, Inc.
Garden City, MI 48135

SUMMARY

Synthesizing main ideas of quality gurus challenged and solved a problem labeled industry norm. This interactive session with team exercises is designed to discuss relevant methods for elevating quality leadership.

KEY WORDS

Problem Solving, quality gurus, robust process, strategy

OVERVIEW OF THE SUBJECT MATTER

Many quality gurus have delivered key messages based on their many years of work in the quality field. Each guru offers a set central themes and a voluminous text around that theme. Even though the themes are unique, the text gets to be overlapping.

Many companies design their quality programs around the central themes of one guru at least at a point in time. The reality is that to understand or to solve a complicated problems, central themes of many gurus must be synthesized. When the idea of synthesis is proposed, either a debate flares up as to which guru is the best or the confusion begins in apparently conflicting central themes. To gain clarity of the central themes and at least to indicate that the synthesis has a merit, the case studies are needed.

One such case study is chosen to look at a chronic problem in a paper industry. Some of the details are generalized for each participant to enjoy the process of synthesis. There is not one right answer to this case study. There may be more than one approach to solve this problem. The idea is to learn how to put quality principles and quality messages to work in the most effective manner.

Not only there is an argument among constituencies of quality gurus, there are arguments within the constituencies of a single guru as well. These arguments are regarding the differences in interpretations of messages. For example, Dr. Deming's message is that at least 85% of the problems are management related and therefore fixable by management. When any specific situation is presented to the company about a complex problem, nobody in management knows how to fix it. There is a debate as to what management fixable means among practitioners. Similarly, Dr. Taguchi messages is that the designs and processes must be robust. The interpretation of robust is that the design or the process must be least sensitive to the uncontrollable variation. And yet when the real-life situation is presented to the Taguchi practitioners there are various interpretations as to what robust means. What is needed are the real-life examples to illustrate some of the actual interpretations.

We begin by understanding the central themes of well-known quality gurus.

TEAM EXERCISE # 1 - WRITE THE CENTRAL THEMES OFFERED BY THE FOLLOWING QUALITY GURUS IN TABLE 1: GAUSS, PARETO, SHEWHART, FISHER, FIEGENBAUM, CROSBY, JURAN, TAGUCHI, SHAININ, AND DEMING.

Table 1: Central themes of the quality gurus

STATISTICS	EXECUTION	MANAGEMENT
GAUSS	DEMING	CROSBY
PARETO	SHAININ	JURAN
SHEWHART	TAGUCHI	FIGENBAUM
FISHER	NEW GURU 1	NEW GURU 2

We will now try to synthesize these themes to solve a real-life problem.

TEAM EXERCISE # 2 - PROPOSE AN APPROACH TO SOLVE THE CASE STUDY PROBLEM PRESENTED BELOW.

A company is in business of making corrugated board which is used as a raw material for making boxes for packaging use. One of the problem that exists almost daily is that about 5% of the product turns out to be unusable or defective. One of the reasons for the defective product is that the product does not stick together. It accounts for 3%. Other 2% are lost in excessive warpage condition.

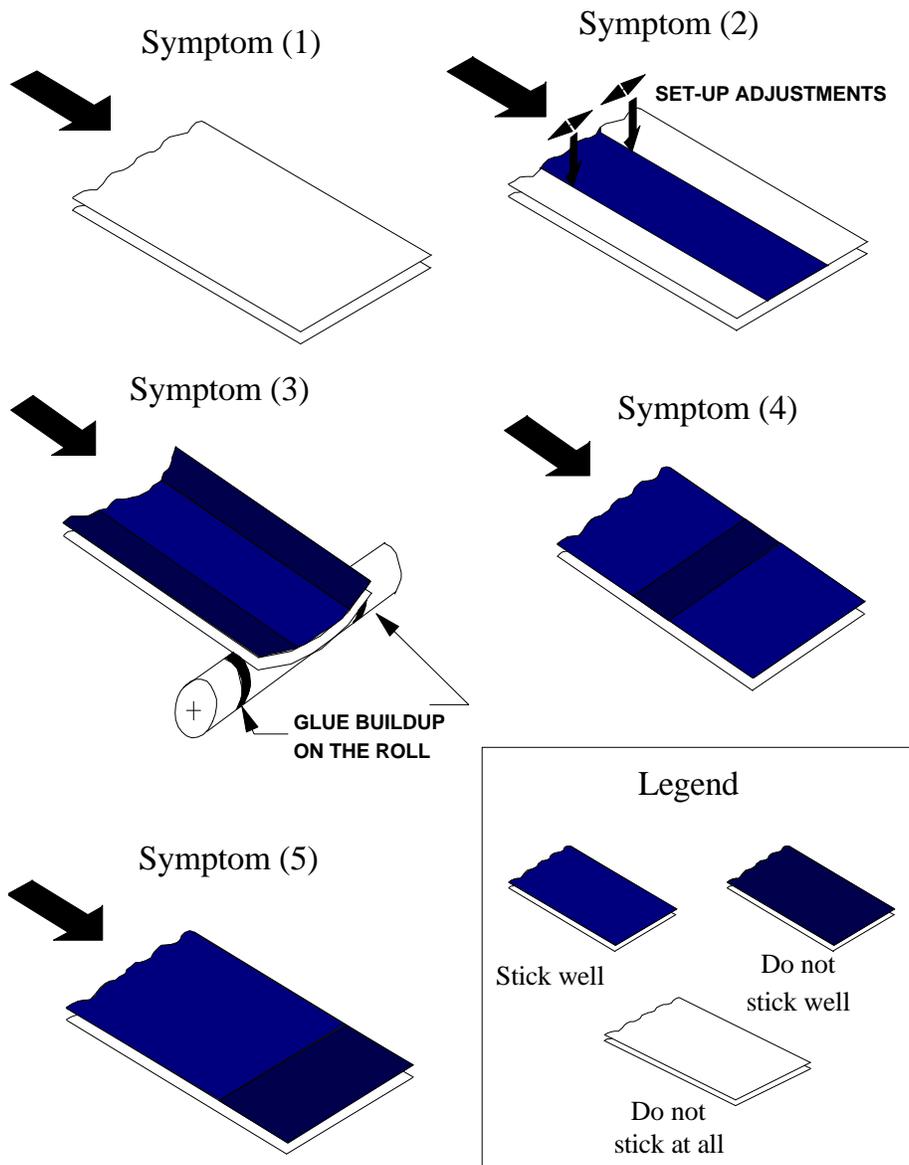


Figure 1 - Problem symptoms

There are many symptoms for paper not sticking together as shown in Figure 1. They are: (1) There is an absence of glue between the paper, (2) The edges of paper are starving for glue but the center part of the width is not, (3) The edges of paper are not glued together as well as the center portion of the width is, (4) The paper is not glued properly lengthwise intermittently, and (5) The problem of poor bond exists across the width. All symptoms are not present simultaneously. The symptom 1 occurs when glue pan runs dry. The symptom 2 occurs whenever a roll of paper is changed from a narrower width to a wider width. The symptom 3 develops and gets worse with respect to time. The symptom 4 is present whenever the machine goes down. The symptom 5 occurs whenever a roll of paper has significantly different moisture level than the preceding roll.

All symptoms except 5th one are traceable to a sub-problem or the root cause. They are:

- (1) Glue storage pan runs out of glue due to inability of the pumping system to keep it at the desired level.
- (2) Whenever a new roll of paper is installed there is a setup adjustment to be made to accommodate the new paper width; an operator forgets occasionally to use this adjustment resulting in an edge starvation.
- (3) The paper rides concave in the machine instead of being flat. The concavity is a result of glue build up on the roller near the paper edges. Paper edges do not seem to get sufficient pressure and temperature for adequate drying due to concavity condition. A Standard Operating Procedure exists for the roller to be cleaned periodically by the operator, however, this task does not get done consistently. An area supervisor is frustrated by the apathetic operators.
- (4) The corrugator interrupts due to malfunction. When it interrupts some length of paper with glue already applied is within the machine and is awaiting restart. As a direct consequence of downtime the glue sets partially creating less than desirable conditions for continued good processing.

The 5th symptom is due to lack of complete understanding between incoming paper moisture variation and the corrugator process variables. To some extent the company understands the compensatory relationship between moisture variation and the corrugator process variables. The company feels that the moisture variation is excessive and the paper supplying company should do something about it. However, the company has learned to deal with the problem by adjusting temperature, speed, pressure, glue viscosity, etc. The company does not like the idea of playing with these variables, the employees do it unwillingly and clumsily. A part of the clumsiness comes from a lack of complete understanding as well as the physical distance between machine controls which are located about 30 feet apart. A part of the unwillingness comes from an uncooperative supplier who claims that the moisture variation is natural and it is as narrow as it can get with the existing technology. There is nothing supplier can do to reduce it.

Propose an approach to solve the chronic problem identified here. Your team should provide the answers to the following questions:

- (1) Which guru's philosophy or central themes will you use to solve the problem?
- (2) If you are going to use the central themes of more than one quality gurus, identify these gurus and the themes you will use.
- (3) Identify the sequence in which you will use these themes and the quality tools.

CONCLUDING REMARKS

Through interactions during the session, we established that complex problems consist of a multiplicity of symptoms and effects. The scientific principles allow us to form strategies by which to select, define, and solve these problems. The solution process is two-fold: the first task is to find the root relationships that cause the symptoms to occur, and the second is to eliminate or control the root relationships.

In the process of learning how to tackle problems, we also found that successful problem-solving is a result of understanding and executing well-established scientific principles. These principles focus on output conditions to enhance the knowledge of the processes which produced them. Many quality gurus, through years of practice, have folded these scientific principles into key quality messages and procedures. It was important to learn about these key thoughts. We also found that it is the synthesis of these key thoughts that allows us to make difficult problems simple and impossible problems approachable. Not only that the synthesis also allowed us to accelerate the problem-solving process.

We assumed in this session that problem symptoms are visible. In an operational setting this assumption is not always true. That is, problem symptoms are not obvious even though problems may exist. In such instances, a skill is required to formulate problems before they can be solved. Therefore, a much bigger challenge lies ahead, not only in solving problems but also in formulation. We can summarize by saying, *TO CALL PROBLEM A PROBLEM IS THE PROBLEM.*

We conclude this session with a mystery and enumeration of possibilities: Is it puzzling why many companies have preferred to listen to a single guru and have avoided the synthesis strategy? We list some possibilities:

- (1) Companies treat the subject of quality as a common-sense issue rather than a science. One guru is good enough to instill this common-sense into all the employees.
- (2) Companies execute quality ideas as if quality is a religion rather than a science. One God should satisfy this requirement.
- (3) Marketing axioms say improve quality just enough to stay in the market and make money on the margins and the market share. You don't necessarily have to use quality as a weapon to kill the competition. If you latch on to one popular quality guru, it shows that you are not ignoring quality.
- (4) Companies still have not understood the richness of quality science and its applications. However, they have learned how to orchestrate to put on a good show. We keep pushing the wasteful cost of orchestration into other segments of the economy.

You may list some of the possibilities on your own. However, our purpose was to emphasize synthesis and learn to solve complex problems, and even go further in formulating some problems and then solving them. I hope the session provided sufficient motivation, enthusiasm, philosophy, methods, and strategies to initiate or to refine the problem-solving tasks.