ABSTRACT

A lot of WIP on your manufacturing floors? Late deliveries? Running at 2 sigma? High returns, rework or scrap? Running over budget? Inventory turns low (3-5/year)? Can't seem to get people to fix problems so they don't come back over and over again? Don't know how to get them to work the system issues so things smooth out and continuously improve? Stuck in the "If it ain't broke, don't fix it" way of thinking?

Prevention is a concept that is difficult to teach, difficult to learn, difficult to grasp and most difficult to implement. The business that learns to prevent its problems can easily outdo competitors, save money and improve operations. Prevention is a concept of critical consequence in health, manufacturing, health and safety and has applications in many other industries. But can a game attract players and teach preventive concepts to a degree that results in buy-in and bottom-line results? This paper and "The Quality Game" present basic preventive concepts in the form of common manufacturing problems and solutions. The game is played online and allows teams or individuals to assume real business roles as players “manage by walking around” a company. Rewards for choosing preventive solutions and penalties for band-aiding problems separate learners from losers as department budgets and company funds are wasted or improved. Players learn to manage quality to world-class standards or run the company into the ground and get fired.

INTRODUCTION

There are two companies.

In the first company, the staff is trained to search for causes and solve problems in a preventive manner. The company runs relatively smoothly and employee lives are easy. The customers and suppliers both like to deal with this company. WIP is low and inventory turns are high. Shipments are on time and of high quality. People look forward to coming to work each day, attendance is high, turnover is low and profitability is keeping everyone gainfully employed and rewarded.

In the second company there are daily firefighting drills and everyone accepts these emergencies, schedule changes, and crises as the normal way of operating. There is a fair amount of finger pointing, badmouthing, arguing and politics. Returns are high and the company is often trying to get customer buy-offs. Employee turnover runs at twenty-five percent each year and no one minds if they miss a day or two. People work long hours and usually receive no reward because profit margins are low or nonexistent.

Which company would you rather work for?

As quality professionals, how long have we been struggling to teach, tempt, cajole, force and fight our way into a position where coworkers will finally get the point that unless they provide good causal analyses and preventive solutions, they will fight the same battles over and over again? Seems like forever. Even if we succeed in one company and that company goes belly up or is bought out, the battle begins anew with new management or when we move to a new "challenge". Teach employees all the SPC, six-sigma, TQM, teamwork, policies, and Kanbans you like. Unless they get to the root cause of problems, the uphill battle continues.

This difficult root cause concept is apparently difficult for graduate students to comprehend at the university level as well. Having just spent two years teaching operations, quality and project management as well as statistics for the California State University in San Luis Obispo, California, I have also found both graduate and undergraduate business students woefully ignorant of the types of common problems and solutions they will have to deal with in the work world.

I have worked in a number of US companies, both here and abroad and taught the same concepts over and over again. Yes, I have had great success due in no small part to the a reversal of the age old theoretical "top down" approach and due in no small part to what I call "The Quality Game".

Let's face it; quality problems come from all directions and all departments. It is typical of most managers (hence, their employees) to find a band-aid, slap it on as quickly as possible and ship that product. They might fight among themselves or with the quality department. They might ignore the problem. They might secretly ship the problem...
or rework it into a mess. But it is not nearly often enough 
that we get solid cooperation in terms of changing the 
system that causes problems. Most often, the rewards are 
attached to dollar values shipped on a monthly basis without 
reciprocal penalties instilled for returns, scrap, rework, 
complaints and lost customers.

So, here's a fun tool to measure, help train and correct 
those brainiacs stuck in the "if it ain't broke, don't fix it" 
mud. I call it The Quality Game. The premises are these:

1. Every company has recurring problems that impact 
   product and service quality
2. Those problems have causes
3. Small problems left unfixed tend to become large 
   problems
4. Large problems cost a lot of money (which is 
   usually lost to the competition).
5. Employees (managers too!) can be evaluated and 
   can learn to eliminate system level causes.

I know number five is a bit of a stretch, but I have 
found that it is possible to change attitudes. I have also 
found that it is easier to change attitudes from the bottom up 
than from the top down.

Take a typical company, say in the five to fifty million 
annual sales range. Lots of WIP on the floors, MRB piled 
high, good sized rework and repair area, no engineers 
working the processes, shipments going out as usual with an 
acceptable return rate, lack of maintenance support. Sound
normal? Figure that there are 100 employees more or less in the company spread throughout the usual departments: HR, operations, manufacturing, engineering, quality, document control, materials, information technology and research and development. Each department spends the day fighting the usual problems. Not an overabundance of teamwork (or interdepartmental love) going on. Everyone is just doing his or her jobs.

So, how is the game played? The board below depicts a common workplace with departments, offices, hallways, a manufacturing floor, conference rooms and bathrooms. Dice are rolled and employees and managers representing
their own departments (or other departments) must move their representative pieces through the hallways as they "manage by walking around". Certain squares are labeled "Problem". When an employee lands on a problem square, a problem caused by that department is randomly selected from the problem deck and read to the employee. If the employee suggests a system level solution, the employee's department budget is rewarded. An on-line playing surface and draft version of The Quality Game are shown above as Figures 1a and 1b respectively.

The primary goal is for the players to team up and solve critical level problems thereby earning customer money. In this manner, the company flourishes and grows. Individuals and teams unable to work together to solve expensive problems cause the company to lose company money to the competition. When the company money is depleted, the company folds and the game is over. The relationship between profitability and the company's ability and willingness to implement system level preventive fixes (process redesign) is shown in Figure 2 below. As the company moves from no action to preventive action, profitability improves.

Individual players may build their own departmental budget to help their department flourish. Players can lose the department budget by providing band-aid answers to problems. When a player consistently fails to address problems at the system level, the department budget is used up and the player is fired. Profitability is reached as the players consistently learn to address problems in a more mature manner (preventively).

These player and company financial gains and losses are tracked on the Company Status Sheet (Figure 3 below).

Figure 5 depicts the relationship between the players' abilities to think in terms of problem root cause and their conceptualization of preventive process redesign solutions. True prevention is not possible without determining problem root cause. As the players learn to think in terms of root cause, they must discover the game strategy for winning: Redesign processes in order to prevent their recurrence.

What kind of problems does the game include? Here are a couple of samples for you to check your thinking against.

1. The purchasing department is overworked and feels it needs to add another employee to help handle engineering purchase orders. Purchasing personnel blame engineering and other departments because "they never fill out the purchase orders correctly". This results in many hours spent clarifying departmental needs and cleaning up incorrect forms and redoing orders.

Correct Solution: The purchasing department is at fault. The purchase orders are complex and have no instructions for completing the form. There is no written procedure for completion and the purchasing department has never trained other personnel in the correct procedures. The purchasing department must simplify the form and provide procedures and training.

If purchasing did not come up with a preventive system level solution for problem 1, the player in the purchasing role would have had to pay engineering part of the purchasing budget.
SUMMARY

A lot of WIP on your manufacturing floors? Late deliveries? Running at 2 sigma? High returns, rework or scrap? Running over budget? Inventory turns low (3-5/year)? Can't seem to get people to fix problems so they don't come back over and over again? Don't know how to get them to work the system issues so things smooth out and continuously improve? Stuck in the "If it ain't broke, don't fix it" way of thinking?

The Quality Game simulates the work environment to an extremely realistic level. The problems presented to the players have come from actual businesses. These problems are the type of problems managers and employees can expect to encounter on a daily basis. The game is an intensive test of the player’s ability to get to the root of the problem and provide system-level solutions. Player abilities and learning curves are tracked and can be used to determine training needs, promotion readiness and can be reported to upper level management for closer supervisory needs.

About the Author

Dr. John Ryan is a consultant (http://www.ryansystems.com) and past lecturer for the Graduate School of Business at the California Polytechnic State University in San Luis Obispo, California where he taught quality, operations, and project management as well as business statistics. He has written numerous quality and operations improvement articles for Quality, Quality Progress, Factory of the Future and other magazines. Dr. Ryan published his first book with the American Society for
Developments in Business Simulation and Experiential Learning, Volume 33, 2006

Figure 5: Determining Root Cause to Reach True Problem Prevention Through Process Redesign

Quality (The Quality Team Concept in Total Quality Control, ASQ, 1992). He has served for more than ten years in an expatriate role for companies such as Seagate Technology, Read-Rite, Sumitomo Heavy Metals, Destron and others throughout South East Asia and has developed across-the-web test software now used by web site owners for web site security and navigability improvement purposes. The Quality Game may be found at http://www.TheQualityGame.com.

ABOUT RYAN SYSTEMS

Ryan Systems provides the quality and operations management tools needed to achieve a continuous improvement operational level. Our mission is to form partnerships with customers based on trust, support and bottom-line, measurable results. Our customers trust us to deliver the training and consulting support to meet their needs in a rapidly changing global business environment. We specialize in customizing solutions to each operation’s particular problems and situation.

Our recently developed Quality and Operations games provide clients with a unique ability to evaluate and change problem resolution thinking. These online individual or team played games drive problem solving away from quick fix thinking to cross-functional prevention levels. We welcome you to join Ryan Systems and the growing list of clients making the change that has saved them millions of dollars and kept them ahead of the competition.

Ryan Systems has been in business since 1990 and serves clients throughout the United States and Asia. Ryan Systems is headquartered in Laie, Hawaii.

Ryan Systems, Inc.
business made better
55-136 Anemoku St.
Laie, HI 96762
http://www.TheQualityGame.com
jryan@ryansystems.com
Phone: (808) 346-0373
FAX: (808) 293-25833

353