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A SYSTEMS APPROACH TO QUALITY IMPROVEMENT

William F. Roth, Jr.

Foreword by Ned Hamson

PRAEGER

New York
Westport, Connecticut
London

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to Quality
Improvement

To my uncle, Fred Roth, with affection and respect, in thanks for the many contributions he has made to both my professional life and my private life.

Foreword

Recently, I was flying from the United States to Australia to give a talk about the trends in quality and participation in the United States. Since the cabin was pressurized throughout the trip, I assume that the ideas that came to mind were not due to a lack of oxygen, but to the enforced opportunity to reflect on what forces were behind the creation of a now 20-year-old quality and participation forest. While some argue and perhaps hope that this forest is simply a very aggressive weed and not the dominant or climax species, I began to see during that 17-hour flight that three positive megatrends are driving individuals and groups in society to nurture and grow this seemingly new way of managing and organizing work. I also remembered one negative megatrend that for a while will continue to retard the full establishment of the new work forest. The trends I discussed were accompanied with a final caveat—look for people, examples, and books that will help you understand and cooperate with these trends. And especially look for resources that will help you apply what has been learned to date about the trends.

The forest example may bring the cutting-edge metaphor to mind, but this doesn't really capture the problem and it implies that it is something to be sliced up or through. The problem for individuals and organizations is not so much to be on the cutting edge as it is to ride the wave. Those who can't learn or won't even dare to ride the wave of change will certainly be swept away by it. Just as gravity, the moon, the earth's rotation, winds, and temperature change all have an impact on the size of a wave or an

ocean, the trends outlined below are those that are creating and driving the sea of change in how organizations (now and in the future) will successfully serve their customers and manage the people and processes who produce their products and services.

Low cost and high quality are no longer separate choices

Consumers now know that they can expect and demand both low cost and high quality. There is not much more to be said about this. Even if the newest electronic whiz-bang product costs $100,000 in its prototype run, we expect that it will only cost $25,000 and will perform flawlessly within a couple of years. And the year after that, we expect to be able to buy a clone at the same quality level for $12,000. This expectation, more than the open market, is driving all producers of products and services crazy and is making consumers happier each year. But these same consumers can get real grouchy when this price-drop doesn't happen. The expectation is so solid now that grouchy consumers assume that if costs don't go down, someone is fixing prices or is denying them the products or services for some illegal, unethical, or immoral reason.

The hard-soft technology paradox

Hard technologies will continue to advance at ever increasing rates. This hardly needs any elaboration. (My highly technical definition of hard and soft technology is as follows: hard technologies are machine-like things; soft technologies have to do with people stuff—ideas, beliefs, values, and the way people organize themselves to achieve goals.) Something new is coming along every day that allows us to do things faster and easier or that we couldn't do before.

The speed at which new hard technologies arrive, however, creates an expectation that there is a hard technology solution just around the corner that will solve soft technology deficiencies. It also leads to a desire to treat and organize people as if they were machines. Has not each of us witnessed the inappropriate machine automation of a process because someone couldn't figure out how to get the people process to work consistently or just got tired of trying? Or if you haven't, ask yourself why is it that the less-automated NUMMI plant often outperformed highly automated GM plants. Or why at different times in history were rebels with fewer high-tech weapons able to win over their "better" equipped opponents.

The slower rates of improvement in soft technologies will increasingly frustrate those who work on and in organizational systems. This boils down to statements such as: "If we can put a man on the moon, why can't we get our management systems to meet that level of performance?" and

"We can pick off atoms and spell out IBM with them, why can't we get workers to turn out consistent high quality and get them to show up for work every day?" or, "It only took 30 seconds to fax my order to them, but it took 20 days for them to send me the wrong part. Why?" This drives individuals throughout organizations to look for new or the "newest" ways to organize people. It also drives those who sell organizational kits or systems to keep inventing new names for their products. This contributes to an ever-increasing number of different kinds of acronym soup on the organization shopping shelves.

All workers from the board room to the factory floor or office floor want to have a say in improving their worklife and work processes

This is a democratic trend that is at work in every part of society. One friend puts it this way—"Even old style bosses don't want to work for old style bosses any more." Another friend who follows Edward Deming's approach very closely, says that "All Harry Hubcap cares about is management improving his two or three square feet of work space, giving him what he needs to do the work properly, and then letting him get on with his work." That friend is right until someone actually improves that work space and consistently gives Harry or Harriet the resources needed. After that, a good number of Harrys or Harriets—whether machine operators, clerks, supervisors, or vice presidents—will want to have input on the area outside of their work space. They will want to have input on how their company/ organization produces products/services for their community/ nation.

You may not be comfortable with this trend and may have many cogent arguments as to why it doesn't apply in certain areas, but it can't be denied. The people in Eastern Europe, Germany, and the Soviet Union recently proved this point. The Chinese will soon offer another proof.

The most wonderful and perplexing thing about the democratic freedom/ control of one's "world" is the same thing that is perplexing about quality—each generation will take a look around their world and then apply the principles of democracy or quality in a new way. Each time someone thinks that definitions of either general or specific quality and freedom have reached the limit of their breadth or depth, and thinks they can rest a while—they are wrong. This is what Tom Peters means by chaos and another writer means by our whitewater future.

The class/status system of the eighteenth century still drives people's views of what is the best and what makes for the "good" life

The quality of life of and material goods possessed by the elite/rich of the eighteenth century still form our view of the good life and the good

person. Hence, we still confuse luxury and quality. Examples—if you are really a good and successful person: you drive a luxury sedan or sports car that runs well only when it is perfectly tuned (which isn't very often); you wear a very expensive and exotic fur or leather coat; and you regularly dine on filet mignon or at very expensive French restaurants. If you are in the radical chic, you may well substitute a good Thai or sushi restaurant for the French one when you are trying to impress folks not in your class/status.

While there are many other examples of this trend, just look at the things that working class people buy when they buy over their heads. After they have bought those things, the upper class/status people no longer buy them; they look for a new definition of luxury in goods and services to differentiate themselves from those of lower class/status.

Remnants of this trend still befuddle us and will for some time. I expect that as the other trends roll along, this negative trend will lose its strength. The immediate challenge for many organizations is to get clear in their minds that there is a real difference between luxury and quality. In the long term, the customer prefers quality over luxury.

As I said earlier, all of us should be on the lookout for resources that help us to understand and cooperate with these trends. We should especially be on the lookout for resources that give us practical and current advice on how to apply what has been learned about these trends. I would add one more bit of advice: look for resources that focus on what really motivates people at work, rather than what we think ought to motivate people or what common sense (accepted wisdom) says motivates people. (Remember that each generation will supply its own definitions for quality and freedom.) In other words, look for resources that exhibit uncommon sense.

Bill Roth's book will help you understand and cooperate with the trends noted above and does so with a great deal of uncommon sense that will empower you with a very practical set of tools and concepts for today's and tomorrow's definitions of quality. His uncommon sense advice in a number of areas will give you as elegant a solution to some of your problems as was Einstein's formula $E = mc^2$ or a concept as concise as actress Mary Pickford's advice, "You may have a fresh start any moment you choose, for this thing we call 'failure' is not the falling down, but the staying down."

Ned Hamson
Editor, *The Journal for Quality and Participation*
Association for Quality and Participation

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Introduction

A growing number of authors is addressing our current inability to keep up with the competition in terms of both industrial and societal development. Concerning industrial development, the evolution of U.S. management systems continues to lag, despite all the buzzwords flying around. Due in large part to this lag, we are also losing ground in the technology race. On the societal side, control seems to be slipping away. We seem incapable of adequately addressing the problems of drugs, crime, poverty, a second-rate public education system, a health care system that is depriving a growing percentage of our population of reasonable attention, and a government seemingly dominated by special interest groups.

Despite all the promise of this era, our quality of life, during both work and leisure hours, is deteriorating.

One growing realization is that the problems of the industrial sector and those of society as a whole are linked. The solution to one set of problems might hold within it the solution to the other.

In the industrial sector, we are involved in a serious cultural change effort that, in most cases, is not producing the desired results. One reason for this failure, which I present in my second book, *Work and Rewards: Redefining Our Worklife Reality*, is that we have skipped the first critical step—examining and updating the concepts upon which our current reality

is built. In terms of the workplace these key concepts are "work," "technology," "rewards," "development," and "success." It turns out that our definitions for most of them originated during the Protestant Reformation (sixteenth century) and haven't changed much since.

Work, for example, is done to generate the resources necessary to improve our physical and, as a result, our emotional security. Work is sacrifice. We spend a considerable part of our lives doing things that contribute little or nothing to the development of our potential to gain the paycheck that allows us to spend our nonworking hours as we see fit.

Technology, originally a friend who helped us provide many of the ingredients of physical and emotional security, is now suspect. Because it costs less and is more dependable, because markets are becoming increasingly competitive and profit margins smaller, technology is currently replacing workers and robbing them of the opportunity to satisfy their needs.

The only important reward is money. The level of individual development achieved is dependent on the amount of money we have to spend on it. Success, therefore, is still measured in terms of dollars and the number of "impression pieces" that we can flash, for, with Madison Avenue's help, these pieces have come to indicate our progress.

These concepts all tie into the Protestant work ethic, which was of great value in helping to pull people out of poverty and building a strong middle class as the backbone of society during the Protestant Reformation. (It still is of value in terms of pulling people out of poverty.) Four hundred years later, however, this work ethic has increasingly become a barrier to the efforts of what is now an extremely strong and well established middle class to get beyond the task of establishing basic physical and emotional security and to realize potential so that people may lead richer lives and contribute more to society.

My suggestion in *Work and Rewards* was that we transform the Protestant work ethic into a more comprehensive development ethic. Work is fine, but there are different types, some more fulfilling than others. Get beyond the dull, repetitious, sacrificial types of jobs. Let technology, with computers in the lead, do these. Encourage people to move on to more challenging, more stimulating developmental work so that our quality of life, both in the workplace and outside, improves. Expand the reward system so that money becomes part of it, rather than the whole; so that work not only allows but encourages the development of individual potential; and so that success becomes a more meaningful concept for us all, one which is defined in terms of contributing rather than of "one-upping."

People I know who have read the book have said, "Fine, we like your 'new world' work environment that gives us increased control over our lives, that results, ultimately, in a healthier society. But how do we get there from here? Your new definitions make sense in terms of modern-day reality. But old habits die hard, and the ones you are attacking, like workplace politics and in-fighting, are very old and stubborn indeed."

A Systems Approach to Quality Improvement is a response to these issues. It addresses the nuts and bolts of the necessary change effort. It is a "how to" book. The first, *Problem Solving for Managers*, was a "what" book. It presented a history of the evolution of management philosophy in the Western world, modern-day trends, and changes that must occur in the future. The second book, *Work and Rewards*, was a "why" book. If we understand what we want and the changes we need to make in the workplace, why are we moving so slowly? What must occur on the most fundamental level to make real progress possible?

A Systems Approach to Quality Improvement, therefore, is my "how to" book. In it, I define a way to implement the changes outlined in *Problem Solving for Managers* and *Work and Rewards*. I describe, step by step, an approach that I believe will allow us as employees to break free from our stale Medieval mentality and regain control of our reality. I then try to show briefly how the results of these changes will unavoidably spill over into society and change that, too.

What I suggest, of course, won't be easy. This is shown by the case study presented. But if people believe the approach to be valid, it will eventually succeed. The main driving force in human beings, after survival has been assured, is the desire to realize potential. When an avenue opens up, we crowd eagerly onto it, even if we might have to double back continually, even if we eventually get lost.

Cultural change in the workplace or on a societal scale requires three key inputs: (1) up-to-date, pragmatic *definitions* of the key concepts upon which we plan to build our new reality; (2) a comprehensive *approach* suited to the involved change effort; and (2) a *vehicle* through which the approach and the desired changes can actually be implemented.

I believe that all three now exist and have been spelled out in sufficient detail to be useable. The problem is that we have not yet realized the value of the three individual inputs to our effort, and we do not yet understand how they fit together.

The approach that will facilitate the desired change in both the workplace and society is the systems approach to management. The systems approach is not new. It is basically a product of scientific investigation. Since the Renaissance and the beginning of what we call "modern sci-

ence," emphasis has been on analysis. When analyzing, scientists break down the object or event under investigation and attempt to identify its parts. In identifying the parts, the investigator carefully studies them and explores the relationships existing between them. The belief has been that by understanding the nature of a system's parts, and the nature of relationships existing between these parts, the investigator can fully understand the nature of the object or event itself.

This approach was critical to the development of the physical sciences. For some disciplines, it was, in fact, the only feasible alternative. For example, because of the limitations of early technology and theory, astronomers were incapable of formulating an accurate overview of the system being explored. They had to piece together their interpretation of it from a very limited series of observations that revealed only random bits of the puzzle.

In terms of the workplace, this approach has been most useful with mechanical systems. The wheel and axle, the lever, and the inclined plane have been identified as the basic design elements of all machines. Different combinations of these have made different manufacturing processes possible. Modifications of these basic elements have allowed the design of more elaborate combinations. Understanding a mechanical process, therefore, comes from understanding what elements/modifications are involved and how they fit together.

Yet when the human machine operator is added to the equation, problems arise with the analytical approach. Initially, attempts were made to define the operator as just another mechanical element. Break the employee's physique and personality down into their basic elements. Identify the employee's work-related needs in terms of their elements. Identify the relationships that exist between those needs. Then define the most efficient way of satisfying the needs.

However, with employee or "social" systems, and with the "socio" part of sociotechnical systems, it has been discovered that the analytical approach does not work as well as with purely technical systems. First, social scientists have realized that any social system is more than simply the sum of its parts and their interactions. For example, any sports fan knows that a team is more than a combination of individual players and the mesh of their athletic capabilities. The team's level of play depends on player friendships, grudges, team pride, moods, what somebody ate for dinner, what the coach says and when, whether every player's shoes fit correctly, and how much it bothers each player if they don't. Effectively modeling such a system is impossible. Too many rapidly changing degrees

of too many variables are involved. And as we all know, successful analysis usually depends on exact modeling.

The second reason that analysis does not work as well with social systems and the social side of sociotechnical systems is that, as we have insinuated, they are part of a larger system or environment that cannot successfully be ignored. The larger system helps shape the embedded system's behavior. In order to fully understand the embedded system, we must also understand the containing system. In order to properly evaluate the operation of a research department, for example, we must understand the company's research-related needs.

As a result of these realizations, emphasis in management philosophy has begun moving away from analysis toward "synthesis." Instead of always looking inward and breaking things down, we are looking outward as well and attempting to piece things together in the most effective manner. This shift in attitude broadens our perspective tremendously. During the long reign of the analytical approach, emphasis was on the questions "what?" and "how?" We asked what the system was supposed to achieve concerning relatively short-term goals and objectives, and then how to organize it most efficiently to meet our desired ends.

The synthetic approach, with its outward perspective, encourages us to address the question of "why?" as well. We are beginning to ask *why* widgets are needed, what their value is. We have learned that social and technical systems on all levels and in all sectors have become so powerful and so interdependent that even a minor shift of emphasis or miscalculation in one can precipitate a far-reaching, devastating chain reaction, and that such frequently innocent blunders can set us *all* back in our quest for a better life.

Partly as a result of the above realizations, the systems approach to management came into vogue during the early 1980s. Interest in it faded, however, before its true value could be understood and appreciated. One reason for its relatively short span of popularity was that too many people in both industry and academia saw it as an unacceptable alternative rather than a complement to analysis. They saw the involved relationship as one of conflict as opposed to enrichment.

Also, the systems approach went against our strong tradition of "boss-ism" and top-down decision making. It called for the free flow of relevant information and for team efforts.

Executives therefore found it easier to label this innovative mindset as esoteric. Discuss it in training classes and executive seminars. Bring it up during brainstorming sessions. But that's where things stop. Actual implementation on a corporate-wide basis would place too great a strain on

the current operation and resources. Things are going well enough. Mistakes are too costly in an increasingly competitive environment. The risk would be too great.

Today, these rationalizations have lost their validity. Things are no longer going well enough. We are losing our competitive advantage in market after market to countries that have learned what we have to offer and have gone beyond it. As a result, we are now playing catch-up.

One product of this unappreciated decline in our preeminence is that we have plunged headlong into the quality improvement movement. The Malcolm Baldrige Award, for example, has rapidly become the most sought after success symbol in the corporate world. The movement holds great promise. Indeed, it holds greater promise than most people suspect. Why do I say this? Because it is the *vehicle* through which the desired changes that we have been talking about in both the workplace and society can be implemented. It is the third necessary piece to our cultural change puzzle.

Unfortunately, yet not unexpectedly, the quality improvement movement has fallen victim to the same deeply ingrained habits that thwarted acceptance of the systems perspective. We have proceeded to break down into its critical parts what must necessarily be a holistic, systemic effort and have focused our attention on perfecting those individual parts. We have looked inward once again, rather than outward.

What will save us in this instance is that the need for improved quality will not disappear. The competition will force us to keep plugging away until we get it right. Then, because a comprehensive quality improvement process involves every part of an organization, and is systemic in nature, the systems perspective will permeate the organization's culture, inevitably producing a reorientation of both management philosophy and practice.

Once this happens in enough companies, all three of the pieces necessary to our quest—the foundational definitions, the approach, and the vehicle—will be in place.

Currently, very few of our corporate and academic leaders are thinking about quality as the vehicle that can bring both society and individual organizations into the "new world." They are starting at the beginning, and necessarily so. They are focusing on making companies profitable, non-profit organizations more effective, and the workplace environment more agreeable to employees.

Once they have succeeded in the above tasks, however, they will most likely begin thinking about sharing the lessons that they have learned with the rest of society. Corporations, supported by unions, government, the