Improving the way organizations run through participative planning and management.
A Tunnel Is More Than A Hole*

Earnest W. Deavenport, Jr., Chairman and CEO
Eastman Chemical Company

Introduction

When I think about Boston, I think about a long tradition of people who know how to make things happen. That's what I want to talk about today--how to make things happen, how to accelerate actions on this quality journey.

There's something else I think about when I visit Boston, and that's tunnels--the Sumner and the Callahan and all the other tunnels on the subway lines that help people get where they want to go in this city. In a lot of ways, tunnels remind me of the quality journey. A tunnel is more than a hole under the water or through a rock. It's a hole with direction, a hole with purpose. A tunnel is a hole created with leadership planning, cooperation, careful measurement, teamwork. As one expert on tunnels said recently: “tunneling people is real creative.”

Abstract

TQM is a lot more than this week's management fad. It is a structure with direction, with purpose. TQM also demands leadership planning, cooperation, measurement, teamwork, and creativity. While the Callahan Tunnel gets us from Logan Airport into the city, the TQM process gets us from where we are today to where we want to be in the future. Of course, even on its most congested days, the Callahan Tunnel is a far faster trip than TQM. In fact, building the Callahan or any other tunnel is a far faster process than building a Total Quality Management process.

I could talk about many different aspects of this quality journey, but I’d like to focus on two areas.

First, I want to talk about the need for quality to be a total company effort, a systemic effort, a company-wide culture that encompasses every activity, every decision and every person in the enterprise. Second, I’ll talk about how to build the kind of enthusiasm that empowers and includes every person in your company to be a part of the TQM journey.

* Eastman Chemical Company received the 1994 Baldrige National Quality Award. This article is from Mr. Deavenport's address at GOAL/QPC's 11th Annual Conference, Boston, Massachusetts, November 14, 1994. Also included are some materials from Eddie Johnson's, Russell Justice's, and Keith Scott's presentations.

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Deavenport—A Tunnel Is More Than A Hole

There's no one right way to do TQM. Each company has to discover its own way

I recall a story I heard about a young student who was looking for the answer to the question, “What is life?” He climbed a mountain in the Himalayas and asked an old man of wisdom, “Master, what is life?” The old man closed his eyes in deep thought, and then he said, “Life is the smell of a fresh new rose.” The student was surprised. “But, master, an old man in the Andes told me life was a sharp stone.” The Himalayan guru looked at him and said, “That’s his life.”

So when you’re asking questions about the quality journey, the answers will vary depending on the person you’re talking to. There is no right answer that fits every company or organization.

Let’s begin by looking at quality as a company-wide effort. TQM is not a subject for dabblers. It cannot be applied to its fullest potential on a project-by-project basis, even though that may be the way it gets started in your organization. It is not a bag of tricks that can be used and tossed out on an as-needed basis.

To be really effective, Total Quality Management has to be total. In fact, it involves more than the company itself. It includes the company’s total environment—the investors, the customers, the suppliers, the employees, the communities where it makes its products, and the communities where its products are sold and used.

If that sounds complicated, that’s because it is. That’s why a lot of companies might do a little benchmarking, a customer survey, maybe a few rounds with SPC charts; and then, a couple of years later, call it quits. They’re the ones who say this TQM stuff doesn’t work.

Frankly, if I’d known how hard it would be, maybe I wouldn’t have embraced TQM so quickly. Sometimes I feel just a little like Moses. When he led his people out of Egypt, did he know that they would be wandering around in the desert for 40 years? Did he know ahead of time how hard the journey would be?

Then on the plus side, did he have any idea how much they would learn about themselves and their destiny during that long journey? Did he know that the lessons learned on that journey would influence people for thousands of years? We hardly ever know everything in advance when we begin any journey. That’s part of the excitement.

You have to look at the total system, and that’s a complex environment; but there’s no alternative way to success

It will be hard work but the journey can be exciting

Journal of Innovative Management
When we first started on the TQM journey at Eastman, we began with just a part of the company. We started where a lot of companies start—in manufacturing. In a very short time, we began to see the power of quality. Manufacturing areas began to be more effective. And I’m not talking about incremental improvements. I’m talking about big jumps in improvement.

It became quite obvious that manufacturing could be even more effective if the people feeding it products, that is, the research and development folks and the marketing folks got involved in the process. Then they got Sales involved. And Purchasing. And Purchasing got the suppliers involved. Sales got customers involved.

Meanwhile, even Eastman’s executives started seeing the company in terms of Total Quality Management instead of a lot of individual departments and separate groups running around doing their thing. We began to see our company as a system of interrelated activities, all of them important, and all of them having an impact on Eastman’s success.

Then we made the really big step. We began to manage Eastman as a system of interrelated activities and functions. We began to focus our journey toward a vision of what we wanted Eastman to be. That’s when quantum leap improvements started happening.

I was reminded of that need for a total systemic approach, not long ago, when I was reading about two different tunnel projects—one here in Boston and the other the famous “Chunnel” between Great Britain and France. Here in Boston, people have been looking forward to the completion of the Ted Williams Tunnel linking the Massachusetts Turnpike directly to Logan Airport. This will ease a lot of driving pains for commuters. In a complex project such as this, there are a lot of different players involved—more than 300 companies, and some 6,500 people. Teamwork is a critical issue. How well these companies work together, how well the people work together, will determine how long it takes to complete the project.

Not long ago, a big problem surfaced. It seems that Boston’s famed blue clay is much weaker in some locations than originally expected. That means changes in the proposed plans. It also means increased costs—upwards of 200 million dollars—and a delay in completion. When something like that happens, it takes teamwork to come up with the solution. The time invested in building teams and agreeing on plans and measurements doesn’t seem like such a waste after all.
An analogy with tunneling, continued

Across the Atlantic in the English Channel is another tunnel project. Now there’s the one people expected to see come to grief. You have two totally different cultures—the British and the French—with different approaches almost everything from food and clothing to work styles. Even the languages are different. Maybe because of those obvious differences, the British and French worked very hard from the first day to make sure there was agreement and coordination at every step of the way. Before the first dirt was shoveled out of one of the biggest holes ever dug, French and British security experts were at work planning how to handle every imaginable emergency. Marketing experts were working on how to sell the "Chunnel" concept to totally different customer groups. The "Chunnel" leaders saw the project as a system of interrelated activities and functions. It’s a TQM approach, a systemic approach. And it works!

Building and maintaining good people relationships is essential

Now I promised earlier that I’d talk about some ways to get everybody in the enterprise excited and involved in this quality journey. Getting people motivated and keeping them motivated is absolutely key to having an effective TQM process. You will never even begin to realize the full potential of Total Quality Management until you have found ways to unleash the power and potential of the human mind and spirit.

Prerequisites for continuous improvement

- Champion is on the scene.
- Business needs are articulated.
- Expected impact is defined.
- Is integrated with past and current efforts.
- Consultants are accessed as catalyst.
- Team is identified.
- Adequate time is allotted.
- In-house resources are used for coaching.
- Model/Process is packaged.

Chart 1

Seven steps to accelerate TQM:

I’d like to talk for just a few minutes about seven steps that leaders can take to accelerate the TQM process.
Step 1. Provide focal points

First, provide a focal point. At Eastman we have a vision of where we want to go, and where we expect this journey to take us. We want to be nothing more, nothing less than the preferred chemical supplier in the world. But how are we going to get there? What are the interim focal points that will lead us in that direction?

We’ve identified our MIO’s—our Major Improvement Opportunities. They’re good for two, three, or maybe even five years; and then you want to look at those, and maybe change them, because those are things you want your entire organization to focus on. Within those MIO’s there are many improvements that need to be made. If an MIO is, for example, to improve equipment reliability, a maintenance team might focus on reducing the frequency of equipment failures. A sales organization may work on customer satisfaction.

Process for identifying Major Improvement Opportunities

Chart 2

"MIO" (Major Improvement Opportunity) Process

1. Define criteria for pinpoint.
2. List possible pinpoints.
3. Develop influence diagram to illustrate relationships.
4. Select pinpoint.
5. Verify MIO pinpoint against checksheet.
6. Make assignments to collect data.

Step 2. Provide lots and lots of communication

When you have the focal point established, it’s time for step two: communicate what needs to be done. If you want people to join you on this journey, if you want them to be enthusiastic and take responsibility for what needs to be done, there has to be lots and lots and lots of communication.

Question: How much should you tell people? Everything you know. Information is power, so if you want empowered people, you have to give them lots and lots of information.
**Major Improvement Opportunity criteria**

<table>
<thead>
<tr>
<th>Criteria For MIO (Major Improvement Opportunity)</th>
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<tbody>
<tr>
<td>Will the customer care if this improves?</td>
</tr>
<tr>
<td>Does it involve our major products or services?</td>
</tr>
<tr>
<td>Is it what we were hired to do?</td>
</tr>
<tr>
<td>Is it valuable? Worthy? Will it make an impact?</td>
</tr>
<tr>
<td>Is it under our sphere of influence/interest?</td>
</tr>
<tr>
<td>It is rallyable/braggable?</td>
</tr>
<tr>
<td>Does it link with current organization strategy and Eastman–Chemical Company/unit MIO’s?</td>
</tr>
</tbody>
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**Step 3. Help teams link-in to the vision and focal points**

Help individuals and teams translate and link-in to the vision and to your established focal points and to establish their own focal points. Help them understand how important they are in this journey. Show them how their jobs contribute to this effort and to the success of the company.

We have a set of four questions at Eastman that we want every employee to be able to answer:

1. **What are the most important things this company is working on?**
2. **How are we, as a company, doing?**
3. **What do you do to help that effort?**
4. **How are you doing?**

Being able to answer those questions makes a person feel important. It makes them realize that each of them is key to making the company successful.

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**Step 4. Develop and carry out management action plan**

The fourth step to accelerating your TQM process is a management action plan. Everybody should know now what needs to be done and what each person’s role is in getting it done. Now you need to work together to establish a plan for getting the work done. The plan should have very specific actions for each team and a way to evaluate and measure those actions. Now that everyone is armed with the knowledge of what needs to be done and how to do it, the teams go to work.

This is where things sometimes break down. Too often management doesn’t notice what’s going on unless something goes wrong or someone asks for help. We’ve found that it’s what you do after everyone has gone on to accomplish their assignments that determines how successful TQM will be.
Elements in managing improvement

Chart 4

Managing Improvement
(What we are asking you to do.)

- Meet with your team.
- Choose a pinpoint (translate) and link-in.
- Study process (to identify causes, critical behaviors).
- Establish baseline and goal.
- Develop action plan (aimed at causes).
- Make performance visible–feedback/scoreboard.
- Plan for reinforcement–self and other.
- Obtain needed help and resources.
- Execute and huddle.

Step 5. Teams work on efforts to improve processes

The fifth step is for the teams to work on improving the processes identified in the plan. By the way, this is a continuous effort. We've found that no matter how much you improve a process, there is always something else that can be done. I will guarantee that if you haven't improved a process in your company within the last two years, there are lots of improvements sitting there to be done. Keep reminding the teams that the processes they are working on relate directly to the company's major improvement opportunities and to the company's vision.

People always work harder when they know that what they're doing is important. I think most organizations, most people, would be very happy to stop right here, after step five. We found that it is what you do after everyone has gone on to accomplish those assignments that really determines how successful TQM will be in the end. This brings me to the sixth step.

Step 6. Use measurements to learn and improve--never as a weapon against people. Provide feedback

Measure progress and provide feedback to the teams. High performance teams and individuals thrive on feedback. But if you're not careful, this is the step where you can ruin all the good work in steps one through five. Measurements should be used as a way to find out how far you've gotten toward your destination, and to make sure you are making progress.

Measurements are an opportunity to adjust the course or the pace. But if you use measurements as a weapon—if you use measurements as a weapon against people—then you'll lose their trust very quickly. And you will probably never again in your organization see an honest measurement.
Step 7. Reinforce behaviors and celebrate results

Reinforce the progress the teams have made and celebrate the results. At Eastman, we celebrate doing the right things. A pat on the back or a voice mail message can work wonders in telling people what you value. We have big celebrations, too. In Tennessee, we really like our biscuits and gravy. So when we reached our annual sales goals well ahead of year-end, we celebrated, because we knew all the rest of that year’s sales would be gravy. Company executives, including me, served biscuits and gravy to our people. A small gesture. One that was really appreciated.

We wanted to make sure they knew they had done something we liked and appreciated. Showing appreciation will always get you an encore. We want lots of encores.

Results you can expect

- 15%-50% performance improvements.
- Commitment...versus...Compliance.
- Made-it-work...versus...Did-my-part.
- Best ever...versus...Standards.
- Teamwork...versus...Individual.
- Cooperation...versus...Competition.
- Celebration...versus...Chewing-out.
- Way of life...versus...Program.
- Every employee a manager.

Conclusion

Before I close, I want to caution you about thinking that any one tool or methodology is what TQM is all about. What I’ve talked about this morning is just two tools that I consider essential to any Total Quality Management effort. I talked about the importance of TQM being an integral, systemic part of the total enterprise. And I talked about the importance of realizing the full potential of your people assets. But that isn’t all TQM is about. It isn’t magic. It isn’t easy. It’s tough, hard work and it takes the efforts of every person in the company.
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Epilog

It’s like those tunnels I was talking about. They aren’t just holes somebody felt like digging. And they weren’t easy projects. Even the "Chunnel", with all the care for teamwork, has had its share of setbacks and delays. In fact, it turns out the rocking motion of the train can set off a car alarm. And don’t take flash pictures. You could set off a fire alarm.

"Quality Management does indeed pay"

There’s a tunnel being built now in Portland, Oregon. The team ran into crumbling rock as they were boring through a mountain. They had to look for another approach. Along our journey, Eastman has had to look for a lot of new approaches, a lot of different approaches. We’ve had to adjust our course. And we will continue to do that. Yes, it’s hard work, but indeed it’s work that’s well worth the effort. It makes a difference in customer satisfaction and it makes a very real difference in the bottom line. Quality Management does indeed pay.

"Total Quality Management has given us a strength beyond anything—beyond anything—we once thought possible"

I mentioned earlier that Boston is a city with a long tradition of making things happen. If it were not for some rabblerousers in Boston, America might still be a colony. And if it were not for some rabblerousers in the business world—the names Deming and Juran, come to mind—American businesses might still be making excuses for their lack of competitiveness. Total Quality Management has given us a strength beyond anything—beyond anything—we once thought possible. In fact, the longer we’re on the journey, the more we learn and the more opportunities we see.

Author information

Earnie Deavenport became Chairman and CEO of Eastman Chemical Company on January 1, 1994, with the spin-off of Eastman from Kodak. He joined Eastman in 1960 as a chemical engineer and rose to fill a number of senior management positions. In 1991 he led a company reorganization from a product-driven to a customer-focused company. In 1993 Eastman became the 10th largest U.S. chemical company, with $3.9 billion in sales AND it was awarded the Malcolm Baldrige National Quality Award.

Mr. Deavenport is chairman of the board of directors of the Chemical Manufacturers Association, a former member of the Tennessee Board of Education, a past president of the United Way of Greater Kingsport, and is active with numerous educational, not-for-profit, and charitable organizations.
Partnerships To Protect The Environment

Authors
Mario E. Ierardi, Environmental Restoration Chief and Linda Geissinger, Program Analyst, M cCllelan Air Force Base, Sacramento, California

Preface: a testimony from President Clinton
"Let me thank you, especially here at M cCllelan, for the partnership you have formed with the Environmental Protection Agency and the California EPA. By streamlining government and working together, you have performed a cleanup that under the old rules would have taken six years and $10 million. You did it in eight weeks at a fifth of the cost. And we intend to do that all over America, copying your leadership."
— President Bill Clinton, during a visit in 1993.

Introduction
The Environmental Management Directorate (EM) for the Sacramento Air Logistics Center is an internationally recognized leader in environmental management. Credible, tangible results have been achieved through a strong and innovative program. By forming partnerships with private industry, the public, and the regulatory agencies, M cCllelan's program infuses Total Quality Environmental Management into the Air Force mission. The vision to do the right thing and challenge needless bureaucracy has led to significant breakthroughs that have improved the environmental quality in the Sacramento area. As a result, the base has been propelled into the national spotlight as an environmental leader and, therefore, is a credit to the U.S. Air Force and the Department of Defense.

Background
1. Sacramento's Environmental Management Vision:
To infuse environmental concepts into the Air Force mission and find a better way to do business. To do this, we will attack pollution on three fronts; the past, the present, and the future. We will restore our contaminated soil and ground water. We will prevent future pollution by reducing the use of hazardous material and release of pollutants to as near zero as possible. We will evaluate and improve operations to ensure compliance. We will preserve our natural resources and historic buildings. To measure our success, we will actively seek feedback from our customers—the community, the media, regulatory agencies and fellow environmentalists.
Background, continued

2. Sacramento’s Environmental Management Ethic:
   • Be open
   • Maintain credibility
   • Press to solve the problem quickly
   • Involve the community
   • Be responsive to community needs
   • Be happy with fair media coverage

Creating a vision and management ethic led to major improvements

EM’s vision and ethic defines its approach to effective and innovative environmental management, setting McClellan apart from others. When contamination was first discovered at the base in the early 1980’s, McClellan faced a fearful and outraged public. Bad press was commonplace. EM’s current operating ethic was learned from experience. Management underwent major paradigm shifts before they accepted the public and the regulatory agencies as team members. Today, McClellan benefits greatly from employing this approach. Neighbors and key public officials are very involved and supportive and McClellan’s credibility is strong among the media and regulatory agencies.

A proactive and pervasive environmental program satisfies internal and external needs

The Sacramento Environmental Management Directorate was the first to be formed within the Department of Defense in 1985. EM is part of the center’s corporate staff, influencing decisions and setting center goals. Since then, EM has been dedicated to satisfying the needs of the public, regulatory agencies, and Air Force by maintaining a proactive and pervasive environmental program. EM has been proactive by responding to community concerns and involving the public in environmental efforts. Key to McClellan’s continuing environmental success is its ability to form new partnerships, turning enemies into allies and opening doors to trust and innovation.

Six partnerships are formed

Environmental Process Improvement Center (EPIC). EPIC partners include the base, the Federal Environmental Protection Agency (EPA), and California EPA (Cal/EPA). Its goal is to promote effective environmental protection through innovative management, education, communication and action.

Clean Sites Private-Public Initiative. Clean Sites is a nonprofit group dedicated to pairing federal facilities with private industry to jointly evaluate innovative remedial technologies. Partners include McClellan, EPA, Clean Sites, and private industry.
Six partnerships, continued

Electric Vehicle Demonstration Project. McClellan has joined with the Sacramento Municipal Utilities District (SMUD) in a joint research and development project to demonstrate the use of electric vehicle technology throughout the Department of Defense.

Sacramento Air Logistics Center Corporate Team. This group includes the center Commander and other key leaders and decision makers. EM is part of this group, infusing environmental culture into the corporate level.

Western Governors' Association. McClellan has joined this group to assist in the coordination of environmental policies in the Western States and develop and test innovative cleanup technologies. McClellan is on the Development of Innovative Technologies (DOIT) Committee as the chair for the “Waste at Military Bases” work group. The group will lobby for improvements in the cleanup process, i.e., procurement and commercialization recommendations. They will also request various research funds. McClellan was selected as a demonstration site in January, 1994.

California Environmental Technology Partnership. McClellan was invited by the Governor of California to join this partnership in November, 1992. The goal of this public/private partnership is to help enhance California's economy and the environment. McClellan serves on the Policy Advisory Council of the California Technology Partnership, chaired by California EPA, working with the Department of Commerce and the California Energy Commission.

Recognition from Western Governors' Association

The EPIC and Clean Sites alliances were highlighted by the Western Governors' Association in October, 1992 as an ideal national example of effective environmental management. These trend-setting partnerships are often referenced by regulatory personnel at international symposiums as models for others to emulate. Tangible benefits from McClellan's environmental alliances are serving as benchmarks for others searching for better ways to conduct business.

Customer feedback is highly positive

Customer satisfaction with McClellan's innovative approach is evident in the feedback received from the regulatory agencies and the community.

"EPA has been encouraging the Federal Government to set an example for other sectors of society in minimizing the production of waste. McClellan AFB has been in the forefront of this effort."

Daniel W. McGovern, EPA regional administrator
CASE STUDY

Customer feedback is highly positive, continued

“I don’t think there’s an example anywhere in the country where we've had more involvement from the community and the officials, than we've seen here at McClellan AFB. This has been a prime example of how you can solve the problem of toxic and hazardous waste, with community involvement an integral part of that solution.”

Congressman Vic Fazio

Beyond customer feedback, the base is analyzing its environmental performance by using an environmental self-assessment program. Metrics are tracking quantifiable results, such as hazardous waste reduction, enabling McClellan to pinpoint ways to increase the quality of its environmental policy planning, implementation, and monitoring.

Eighteen specific examples demonstrate benefits achieved and results measured

1. **Air Force New Restoration Plan.** McClellan developed this plan, which if implemented, could save nearly $500 million out of $1.6 billion forecasted for total restoration costs at McClellan AFB. Savings would result from major paradigm shifts and better utilization of technology. For example, to accelerate site cleanup, McClellan is involving regulators up front in long-range (5 years and over) strategic planning. McClellan is also implementing the new EPA Superfund paradigm at the base. These approaches are based on close collaboration, that is, all parties holding a stake in the project have a sense of “buying in” to all phases of the project, from initial concept through planning and implementation. Under EPIC, McClellan is also developing new contracting methods to address the need for flexibility, and cradle-to-grave contract capability. McClellan’s ability to develop such new approaches stems from its commitment to challenge business as usual and constantly seek and implement process improvements.

2. **Containment of Contaminated Ground Water.** Approximately 500 acres of McClellan’s soils are contaminated. At points, the soil contamination is almost 400 feet deep and the problem is exacerbated by non-homogeneous soil layers. When contaminants such as solvents and degreasers seep through the soil, ground water plumes become contaminated. McClellan completed several major cleanup actions, including construction and operation of award-winning groundwater extraction systems which pump and treat contaminated ground water. By containing the contaminated water, and providing 550 nearby residents with municipal water supplies, McClellan has removed any potential health threat to the public. In 1990, the base received the Renew America Award, and National Environmental Awards Council’s Search for Success Environmental Achievement Award for Ground Water Restoration.

3. **The Clean Sites Partnership.** McClellan AFB is Clean Sites’ prime demonstration
base because of the high level of cooperation that already exists at the base due to efforts such as EPIC. This public/private partnership is designed to address barriers to using innovative technologies, such as regulatory and community acceptance, risk of failure to meet cleanup standards, and lack of reliable cost and performance information. The joint evaluation offers participating companies real-world cost and performance data on a cost-sharing basis and without the associated risks of failure. As a result of Clean Sites success, seven private companies with contamination problems similar to those at McClellan are developing several promising cleanup methods for demonstration at the base. These include soil vapor extraction and two-phase vacuum extraction. If proven useful at McClellan, these methods could be exported to similar sites worldwide.

4. High Tech Results. Results from the public/private partnership include a test performed at McClellan using a new soil cleaning method called Soil Vapor Extraction. In eight weeks, this method removed as much volatile organic compounds from the soil gas as it would have taken the traditional technology to remove from groundwater in five years.

The partnership is also successfully demonstrating another innovative cleanup method called Two-Phase Vapor Extraction. This method uses a high vacuum to remove contaminants from above and below the water table simultaneously. The results are very promising with estimates that Two Phase Extraction will reduce remediation costs by an order of magnitude, from $1370 per pound of contaminant to $160 per pound.

5. Other New Technologies. Technologies to fully clean all the contaminated soil at McClellan do not exist. In addition to its public/private partnership efforts, McClellan is working with research scientists and federal and state agencies to develop other soil cleaning methods. These include: soil gas technologies such as photolytic destruction, electron beam destruction, and biofilter. Groundwater treatment technologies under study include cometabolic and methanotrophic biotreatment. As a result of McClellan's bench scale and pilot tests, new technologies are being developed with potential worldwide application.

6. National Environmental Test Site. McClellan is a Department of Defense-sponsored National Test Site for environmental technologies. In this role, McClellan serves as a proving ground for developing, demonstrating, and commercializing environmental technologies. The goal of this program is to promote rapid transfer of technology from the laboratory to field applications.

Lessons learned at McClellan will be shared throughout the Department of Defense, standardizing data collection and analysis among the services. Benefits will include accelerated transfer of innovative cleanup technologies, comprehensive perfor-
Eighteen specific examples demonstrate benefits achieved and results measured, continued

management data available in a tri-service data base, life cycle cost information, and design engineering guidelines.

7. Process Improvements for Accelerating Cleanup.

• Due to internal innovations initiated by McClellan’s environmental engineers, the base developed and tested a new, self-contained ground water sampling vehicle that reduces sampling costs by over 40 percent and hazardous waste purge water by over 80 percent. This saves about one million dollars a year at McClellan.

• Since McClellan’s cleanup program began, data generation has expanded tenfold. To accelerate cleanup, data must be readily accessible. A prototype geographically-based Technical Information System is being developed at McClellan for the Air Force. This system will improve access to data needed for cost-effective, technically-sound remedial decisions. Estimates show that this system could save $30 million over the life-cycle of McClellan’s program.

• Field laboratories are being used at McClellan to expedite its remedial investigation and save sampling costs. These portable, on-site labs have many advantages over the traditionally-used fixed laboratories. Again, internal ingenuity enabled this process improvement which, to date, has enabled McClellan to save $450,000 for a 2-month period of work.

• McClellan implemented a process for screening risks to establish priorities for the use of installation resources. The approach allows the categorization of sites into groups based on human health risk factors. The purpose of such categorization is to put the sites that present the greatest risk on a fast track for cleanup, resulting in maximum reduction in risk in the shortest time.

8. Hazardous Waste Reduction. McClellan’s corporate team, guided by EM’s expertise, is eliminating hazardous material usage throughout the base. As a large industrial complex, the Sacramento Air Logistics Center generates more than 470 hazardous waste streams. These are by-products of maintenance and repair work, such as paint stripping, painting, electroplating, and parts cleaning.

EM uses a Total Quality Management metric to track hazardous waste reduction and drive the appropriate action. The metric shows that between 1985 and 1993, McClellan reduced its hazardous waste by 78 percent—about 3,900 tons per year. Also during this time, the base reduced air emissions of volatile organic compounds from
Eighteen specific examples demonstrate benefits achieved and results measured, continued

1,000 to 366 tons per year, a 64 percent reduction. By tracking industrial processes which use hazardous materials, EM was able to identify targets for reduction and subsequently implement necessary measures. Some reduction measures taken include: substituting bead blasting for chemical paint stripping, recycling cadmium from plating solutions, and substituting aqueous cleaners for solvents.

McClellan received the Air Force General Thomas D. White Award for Environmental Pollution Prevention in 1991, and the U.S. EPA Region 9 Pollution Prevention Achievement Award for 1991.

9. Five-Year Plan. McClellan enacted a five-year plan in 1988 to eliminate all hazardous waste discharges into an industrial waste line. This goal was achieved in 1993 and now the line is used for the transport of non-hazardous waste water. McClellan reached this milestone by working with its EPIC partners. The goal is to prove that pollution prevention strategies reduce waste while cutting costs and liabilities by dealing with pollution upstream at its source, rather than at the point of pipeline emissions.

10. The Greening of the Blue. One major example of how McClellan is infusing environmental concerns into the Air Force mission is evident in the development of the newest jet fighter, the F-22. EM served on the F-22 development team, working with private industry and others on-base to instill environmental requirements into the aircraft’s design. As a result, the F-22 is the first Department of Defense weapon system to fully integrate such concerns from cradle-to-grave. Every effort was made to reduce hazardous material usage and waste throughout the aircraft’s life cycle.

11. Ozone Layer Protection Program. Through the efforts of EM, McClellan AFB is an Air Force leader in stratospheric ozone protection, aggressively reducing ozone level depleting substances (OLDS), such as chlorofluorocarbons (CFCs), wherever possible. McClellan’s actions include the retrofit of two 1,000 ton chillers to use H CFC-124 instead of the original CFC-11. Now a more efficient machine uses a refrigerant 50 times less harmful to the ozone layer than CFC-11. Further, the base recovered approximately 6,000 pounds of CFC-11 for use in extending the life cycle of older machines which cannot be economically retrofitted. Another example is the acquisition of refrigerant recovery machines for other tenant organizations on base. They have eliminated the acquisition of new CFC refrigerants and use recovered and recycled products to the maximum extent feasible. The base was the Air Force nominee for the EPA’s 1992 Stratospheric Ozone Layer Protection Award.
12. The Electric Vehicle Demonstration Partnership. McClellan and Sacramento Municipal Utilities District (SMUD) are leading this joint research and development project. Successful electric vehicle demonstrations are being used as a pilot for their expanded use at other Department of Defense installations in California. McClellan has acquired a fleet of 60 electric vehicles for demonstration. EM is working to transfer aerospace technologies to improve electric vehicle performance. Where appropriate, the base is using its manufacturing capability to prototype electric vehicle components. To further advance the use of alternative vehicles to improve air quality, the base has obtained five methanol-flexible-fueled vehicles to reduce emissions from the base’s fleet and help create demand for methanol fuel in order to encourage its sale at local service stations.

13. Safer, Cleaner Jet Fuel. McClellan AFB is located in the Sacramento Valley Air Basin which is designated as a nonattainment zone for particulate matter and ozone. Strict limits are placed on emissions of reactive organic gases and oxides of nitrogen in this area. To reduce such emissions, McClellan was the first Air Force base in the country to voluntarily switch from JP-4 to JP-8. This safer, less-polluting fuel reduces hydrocarbon air emissions by 25 tons per year.

14. Air Toxics Inventory. Another example of McClellan’s pollution prevention leadership is evident in its air toxics program. McClellan was the first base in the Air Force to accomplish an air toxics inventory and establish an air toxics emissions baseline. As a result, the base targeted and eliminated emission sources wherever possible. Also, other bases planning to conduct an inventory are using McClellan as a model for their efforts.

15. Community College Exchange. EPIC is participating in a community college program focused on environmentally conscientious manufacturing. The Sierra Community College in Rocklin, CA, is allied with Lawrence Livermore Laboratory, in Livermore, CA, and Sandia Laboratory, in Albuquerque, NM to exchange information on hazardous waste minimization. As a result of McClellan’s involvement, the base’s pollution prevention breakthroughs are being crossfed with private industry and other government facilities.

16. The Environmental Training Center. A key McClellan vision is to serve as an environmental support center for other government sites, particularly within the Department of Defense. As such, the base would provide resources such as extensive training critical to a sound environmental program. To achieve this, EM joined with the
University of California, Davis, to provide formal environmental training on base. A program of courses is offered, meeting state requirements to obtain a Certificate in Hazardous Materials Handling. This program has garnered participation from state regulatory representatives, local community officials, and base personnel. As a result, McClellan has better qualified people, which leads to an improved environmental culture. Further, McClellan developed a joint proposal with private industry, the University of California and the California EPA requesting Advanced Research Projects Agency (ARPA) funds for a Public Private Environmental Training Partnership and a Regional (Advanced Environmental) Technology Demonstration Partnership.

17. Information Crossfeed Results. EPIC is working to share lessons learned with other government facilities, industry, and the public. McClellan has taken the lead to implement a comprehensive communications program to distribute information and exchange ideas regarding all aspects of environment management. EPIC Greensheet bulletins are mailed to more than 2,000 addressees, including other military facilities, environmental news publications and regulatory agencies. This effort goes beyond the base’s more traditional environmental community relations program. Response to this effort has been great, with other bases frequently calling McClellan to discuss potential technology transfers. McClellan is also sharing information through exhibits and speeches presented at trade shows and environmental conferences. These events are often attended by international audiences. As a result, the base has hosted visitors from several foreign countries interested in touring McClellan to learn ways to improve their operations.

18. Community Outreach Program. Community relations are a top priority. Two full-time public affair professionals work in EM to ensure public participation. Examples of outreach initiatives include citizen review of cleanup options, community newsletters and interviews. In 1991, EM competed with the private sector and won the International Association of Business Communicators Crystal Award for its overall environmental community relations program.

Other honors

- 1994 AF Material Command Environmental Restoration Award.
- 1993 President’s Council of Management Improvement (PCMI) Award for Management Excellence “in recognition of its efforts to forge partnerships with private industry, the public, and regulatory agencies and to develop plans and initiate pilot projects to improve the environmental quality at McClellan AFB.”
- 1991 AF General Thomas D. White Environmental Planning Award.
- 1991 California Governors Award for Historic Preservation.
- 1988 General Thomas D. White Award for Environmental Quality.
**Conclusion**

The partnerships that McClellan has made have proven that partnerships are key to finding a better way. Teamwork builds better solutions than individual efforts. Trust can be achieved through team building, during which group members learn to capitalize on one another’s strengths for the benefit of the entire group. McClellan has also discovered that it is tremendously beneficial to bring in technical ideas from different sectors, for example, private industry, as with Clean Sites.

**Author information**

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The Installation Restoration Program Division includes 45 engineers and scientists taking part in the extensive efforts being made at McClellan Air Force Base to clean up contamination caused by past disposal practices. This is the largest cleanup program in the Air Force and one of the most complex cleanup efforts within the country. The division’s aggressive work, processes and results have gained it extensive recognition and praise.
TQM In Retail: Structural And Cultural Transformation Of A Grocery Chain

Tidyman's Foods, Inc.

Authors

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Company background

Tidyman’s Stores, Inc. is a medium-sized chain of 10 grocery stores and a meat processing plant operating in eastern Washington state, northern Idaho, and western Montana.

Founded in 1965 as a “Warehouse Store” competing mainly on price, Tidyman’s has evolved in recent years into a full service supermarket chain competing on the basis of service, quality, and value.

With annual sales of about $250 million, Tidyman's is employee-owned through an Employee Stock Ownership Plan. The company has 1,000 full-time and 500 part-time employees.

Decision is made to explore TQM

Tidyman’s executives became interested in the work of Dr. W. Edwards Deming in 1991, and after studying his 14 Points for Management, determined that they wished to put the 14 Points to work. After a period of study and discussion, it became apparent that the firm would need outside assistance. After a short search, Tidyman’s engaged Effective Management Systems to assist in the process. Effective Management Systems Corporation is a consulting firm which specializes in assisting its clients with the organization of work, basing its approach in general system theory and the work of Deming, Juran, and Shingo.

The two companies agreed to a two-stage contract—stage one was limited to five days of executive training, and stage two, contingent upon an agreement to go ahead, created a one and one-half year schedule for TQM roll-out.

Over a six-week period in spring of 1992, Effective Management Systems led about 30 Tidyman’s executives, product supervisors, and store managers in five days of training on TQM. The training covered all aspects of TQM, including process improvement, QFD, Benchmarking, Hoshin Planning, Cross-Functional Management, and partnering with suppliers.
Two key factors for TQM roll-out

Effective Management Systems' consultants have learned over the years that successful roll-out of TQM requires achievement of two key points in the management training:

1) top managers must experience the seven frontline tools of quality, otherwise the tools remain abstract, and managers will often fail to support frontline process improvement teams effectively; and

2) among the top and middle management of the organization there must be a critical mass of individuals who are committed to lead and support TQM deployment. This critical mass must include the CEO, the CFO, and other key executives.

Making the TQM decision

The training was structured partially around actual team work in which executives used the front-line tools to solve problems. At the end of the training, the consultants posed this question: Knowing what you now know, and knowing that you cannot turn back once you begin, do you wish to continue? The consultants then left the executives to ponder the question. Within about a month and one-half, Tidyman's made the commitment to go forward.

Starting the TQM journey with awareness and open eyes

Tidyman's executives were well aware of the difficulties involved in the journey they were about to undertake. Grocery stores traditionally operate as profit centers, both internally, and store to store. For chains such as Tidyman's, the competition generated through the profit center approach was at the same time dysfunctional and a source of great inspiration and imagination. Store managers were extremely competitive from store to store, and department managers were extremely competitive within stores. Some of Tidyman's greatest innovations had sprung from this competition, and yet the competition also created unevenness from store to store which was a sore point with customers. Customers complained about uneven pricing, lack of merchandise consistency, and customer return policies which varied from store to store. Store managers, not willing to share ideas and techniques with each other, safeguarded valuable ideas at the same time they were attempting surreptitiously to learn what others were doing.

Accepting that the decision to proceed is not a tentative one

When they made their decision to proceed, executives and store managers realized that they were committing to a permanent change in their way of doing business. That was and has been extremely discomfiting to many. Furthermore, it is always difficult to
Accepting that the decision to proceed is not a tentative one, continued

change, particularly when one has grown up with a particular way of doing business and when things seem to be going all right. The real challenge from the beginning has been how to achieve system-wide standardization and yet preserve and enhance the powerful entrepreneurial and creative spirit which has been the Tidyman's hallmark.

Creating a Quality Improvement Council chaired by the CEO

The first step in roll-out was the establishment of a Tidyman's Quality Improvement Council to oversee the entire process. The Council, chaired by the corporation's CEO, elected to meet monthly.

Identifying critical processes and deciding where to begin

After examining critical corporate processes and historic problems, the Quality Improvement Council selected the first set of project teams. The Council had agreed on a staged roll-out process made up of five three-month project cycles. (It takes 1-12 weeks for a process improvement team to complete its training and its work.)

A pilot project introduces and adjusts TQM to the corporate culture

The first cycle, beginning in June 1992, was a pilot cycle (PDCA), designed to introduce the concept to the company and to adjust the process to the particulars of the company culture. The first cycle was made up of seven process improvement teams, each using the seven frontline tools of quality to work on a different problem. All teams would be cross-functional and would have between five and eight members. Some teams would solve problems at headquarters, some teams would work within stores, and some teams would handle issues which crossed store and departmental boundaries. The CEO and top executives would serve on these teams as a signal to all employees that TQM was an important priority for the company. At the end of the first cycle, store teams presented their findings to a meeting of store executives and employees.

Initial results

When they reported their results, it quickly became evident that the process would have high impact at Tidyman's stores. At base, good process improvement is a "war" against non value-added costs and work, and the first wave of teams demonstrated the savings which could be realized.

One team discovered that it could save tens of thousands of dollars through a system of better control and by contracting for store laundry. Another discovered impressive savings could be captured through partnering with its refrigeration maintenance firm in a simple program to train store employees on how to maintain equipment properly. The program worked for both parties. Tidyman's controlled "shrink"—loss of product due to spoilage. The maintenance firm received fewer "false alarm" calls for help. A third project team managed to improve a mail delivery process which was
**Initial results, continued**

Generating tremendous employee frustration and hidden costs for the firm. All in all, the first cycle of teams identified cost savings, which when fully deployed, will easily exceed the entire cost of the implementation consulting contract.

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**Continuing training and leader development**

Tidyman’s has continued to frontline train process improvement teams working in three-month cycles. To date, four seven-team cycles have been completed, and at least 200 of Tidyman’s 1,500 employees have had one or more team experiences. In addition, a cadre of team leaders and trainers has been developed for further team deployment, and a senior executive now has been appointed to coordinate the team process. He and other managers have also embarked on a project to streamline the team problem-solving process, while at the same time maintaining its rigorous scientific approach.

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**Second project is “Quality Function Deployment--QFD”**

Beginning with the second project cycle of seven frontline teams, in fall of 1992, Tidyman’s launched its first Quality Function Deployment project. The project aimed at determining whether Limousin Beef—a naturally low-fat beef—was a viable part of the meat department product mix and how this beef should be marketed.

The project began with the assembling of a cross-functional team, which also included the CEO, and other top executives. The team educated itself on Limousin beef and prepared a detailed list of questions which it wished to address. Robinson Research, a Spokane marketing consulting firm, was asked to assemble a 12-person focus group made up of Tidyman’s shoppers and non-shoppers in the psychographic customers groups targeted by Tidyman’s. The focus group met and discussed the questions for two and one-half hours, and a court reporter made a complete 120-page transcript of their discussion.

The QFD team spent hours meticulously digesting and deeply analyzing the focus group record and converting the transcript into a series of customer requirements for Limousin beef and the entire meat department. These findings were validated through a larger, 150-person polling and focus group whose preferences were electronically monitored and analyzed by the Spokane firm, Tellback. This process enabled the QFD team to select the most important customer requirements for design of a meat department selling Limousin beef. At this point, the team was able to construct the house of quality. The result was a radical redesign of the meat counter in a way which gave customers the service and information they needed, added theatre, anticipated customer needs, and brought the customers closer to the company. The design is now undergoing a pilot test at the company’s Post Falls, Idaho store.
Another QFD project: store bakery

A second QFD project was undertaken in late spring of 1993 to explore what customers want from a store bakery. In both of these projects, the professionals who work in the store have been absolutely surprised by customer preferences. For example, focus group customers were unequivocal in their belief and resentment that the bakery has become a confectionery in many supermarkets. Customers also hate bakery cake icing. As commonplace as this may seem to the consumer, it is news to the professionals working in the bakery who have come to trust that meeting established professional and technical standards is equivalent to pleasing the customer. There is no question that QFD will give Tidyman’s an impressive market leadership over time, because the store will be able to stay ahead of customers and will easily outdistance the competition.

Introducing “Hoshin Planning”

At its three-day fall, 1992 management meeting, Tidyman’s launched its nine-month Hoshin Planning process. At that meeting, using affinity diagrams, executives identified the most significant trends and driving forces which would affect the company in the coming five years. A planning team of top executives, including the CEO, the CFO, and operations officer, was created, and the team set out to study trends and driving forces in detail.

Articulating core competencies and corporate values; writing a mission statement

Over a period of several intense meetings, team members educated themselves on these strategic considerations. At this point, the team identified Tidyman’s core competencies to address these trends and driving forces, and combining core competencies with corporate values, the team drafted a corporate Mission Statement (see appendix). Successive editions of the mission statement were circulated throughout the corporation until the team was satisfied that there had been substantial input, and the statement was then approved by top management and the corporate board. Flying teams of managers then visited all stores to explain the mission statement to employees and encourage employees to reflect on how it related to their daily work.

Using newsletter to communicate

Currently, the corporate newsletter features a section called “modeling our mission statement,” which contains interesting stories from frontline employees on how they are carrying out the company mission.
Example: Lewiston went fishing

The July 15, 1993, edition of the newsletter featured a story headlined under the mission statement commitment, “We welcome opportunities to enhance the quality of life of everyone living in the communities we serve.”

LEWISTON WENT FISHING - Recently a customer wanted to buy five trout to use in a class for students to dissect. The trout needed to be full size, not fillet (with heads and body remaining). Even though the seafood department did not have what they needed, they got more than they expected! Jackie Simpson, from Lewiston’s meat department, and her husband went fishing after work in the Asotin Creek, caught five trout and delivered them to Breckenridge Learning Center for the students. Now that’s called service - unbelievable!

Identifying trends, driving forces and possible futures

With the completion and deployment of the mission statement, the planning team refocused on the trends and driving forces, building three future scenarios in order to study what the probable range of future development would be.

Creating a strategic vision

Using these scenarios as a guide, the planning team created a detailed strategic vision intended to assure that the company will prosper no matter what happens in the future.

Developing strategic goals

From the strategic vision, five annual corporate goals were derived. Typically, first year strategic goals aim at creating an infrastructure for further strategic development and aid in driving toward the strategic vision.

1993-94 Annual Goals selected by the planning team include:
- working with customers to develop system-wide standards for Northwest Fresh;
- establishing a company-wide Just-in-Time Training, development and career planning program for all Tidyman’s employees;
- teaching all employees the tools and processes for removing non value-added work and costs;
- completion of formal partnering agreements with Tidyman’s top suppliers; and
- development and communication of company-wide criteria and financial commitment for partnering with their customers in the community.

Cross-functional committees of managers and employees were then appointed to deploy these goals. These cross-functional committees completed their goal deployment work in 1994.
**Facing internal competition**

At the same fall, 1992 meeting where strategic planning was undertaken, Tidyman’s executives struggled openly for the first time with the issue of internal competition. It was not possible with this traditionally competitive group to assert that competition, per se, is undesirable. Instead, top managers and the consultants asked the group to identify and discuss negative forms of competition in Tidyman’s system. The group agreed that store-to-store competition, profit center competition, and even competition for bonuses, had produced negative effects over the years. At this meeting, it was determined that the company would have to address all of these in the coming year. Importantly, the group agreed in principle that it would have to address the company’s compensation system and devise an approach more in keeping with the values of Total Quality Management.

**Creating “Just-In-Time--JIT” systems for food products**

In fall of 1991, before it had begun its TQM work, Tidyman’s had deployed in two stores a revolutionary concept called “Northwest Fresh.” After pilot testing, the concept was introduced into other stores in the chain. Fundamentally, Northwest Fresh is a just-in-time product and service delivery system. The program is predicated on a seamless relationship linking wholesale distributor, retailer, and the customer. The system does not tolerate items which are not fresh. Take produce, for example. Each store is committed not to market day-old produce or produce which is not completely fresh. Clearly, Northwest Fresh stretches store practice in several important ways—economics demands that stores carry just enough inventory to satisfy immediate need. That is, they must not run out of any produce item and they must not order so much that they have to dispose of surplus items that they cannot sell. In short, they must always have just enough on hand to exactly satisfy customer demand on that day. Clearly, this system has implications for suppliers, for store inventory, for marketing, and for the store’s relationship with its customers.

**Developing supplier systems**

The success of Northwest Fresh and other initiatives will depend heavily on Tidyman’s ability to align its suppliers for store success. Early on, Tidyman’s initiated discussions with its major wholesale supplier. At that time, the supplier indicated a strong desire to create a long-term, non-adversarial relationship with Tidyman’s, based on mutual interest and mutual gain.

A series of partnering discussions identified the concrete interests of each party and resulted in a plan to pilot test a partnering relationship through a joint buying project. The project was launched, but as it was being rolled out, the general manager of the wholesale supplier retired. The process has continued, and the project will be deployed later. Meanwhile, it has been necessary for Tidyman’s top managers to initiate a series of conversations to educate the new general manager in Tidyman’s new priori-
ties and the basics of the TQM customer-supplier relationship. The retirement demonstrates clearly the crucial role of top management in assuring TQM success. Tidyman's executives believe that, in time, they can win this individual over, but in the meantime a few adversarial practices have begun to creep back into the Tidyman-supplier relationship.

Tidyman's recognizes that it will be necessary for the corporation to “grow” a set of quality suppliers over time and that this means providing ongoing technical assistance to those who are willing to make the commitment. In order to do this, Tidyman's has sponsored the creation of a suppliers school, aimed at key suppliers who can influence other suppliers. The school will be initiated in October in a two and one-half day workshop which educates and enlists key suppliers to meet Northwest Fresh standards and commit to never ending improvement.

At their spring, 1993 management meeting, the Tidyman's executives confronted the question of how they compete. Traditionally, in competing successfully in the grocery business, store managers have resorted to cutting costs (e.g., salaries) in order to reduce prices, increase volume, and enhance profits. This meeting was devoted to an exploration of the relationships between sales, margins, and costs in a Total Quality Management/Northwest Fresh setting. In a structured setting, managers were asked to explore how TQM and Northwest Fresh could assist in increasing cash flow and profits in order to reach a financial goal. The CEO and Chief Financial Officer wished to demonstrate to the store managers and other executives that TQM and Northwest Fresh demanded a different approach—finding ways to cut costs by identifying and eliminating non-value-added work and costs and building long-term customer loyalty.

In January 1993, the Chief Financial Officer and one of the consultants attended Peter Scholtes workshop on compensation, recognition, and reward. This experience opened the door to other possibilities, and at the company’s winter, 1993 management meeting, a committee was chartered to build a new compensation system for Tidyman’s stores.

Based on a study of TQM and Northwest Fresh, the committee determined that the new system should have the following characteristics. It should:

- be market-driven and fair to all (equity).
- reward or encourage continual improvement of the system.
- recognize increasing skill and knowledge development.
- reward team performance.
Building a new compensation system, continued

- provide opportunities to increase compensation.
- reflect customer satisfaction.
- focus on long-term company performance.
- be unrelated to performance appraisal.
- include intangible factors.
- support corporate goals.
- meet basic employee needs.
- encourage career employment.

A new kind of accounting was required to show real profit and loss

Activity-Based Costing (ABC) is the accounting analog to TQM. It assists managers and frontline employees in identifying and targeting non-value-added costs and work. In spring of 1993, the Chief Financial Officer initiated a series of ABC projects at the Tidyman’s Meat Plant. The plant had not shown the profitability or productivity expected. Traditional accounting methods did not reveal what could be causing this problem. The use of an ABC project demonstrated, for example, that the plant was losing money on cut chickens and pinpointed non-value-added work. The work was changed by a plant team, and the company began to earn a profit on the chickens. Likewise, the meat plant’s assistant manager had introduced a line of boxed, cut pork, which required only that plant workers “pick” and ship the pork to order. ABC demonstrated that what appeared to be a money-maker was a money-loser, and more importantly, that increasing volume would simply increase losses.

Management spends three days in review and planning

The Tidyman’s three-day summer 1993 management meeting was planned to “bring it all together.” The program was designed to showcase and underline the complete set of relationships among the Northwest Fresh Just-In-Time product and service delivery system, the process improvement teams, the QFD projects, Benchmarking, the mission, strategic vision, and goals (Hoshin Planning system), Cross-Functional Management, Activity-Based Costing, and the new compensation system. At this meeting, managers heard reports from all teams, discussed long- and short-term implications for the corporation, and brought together the entire package of change under the rubric of Lean Service and Production. At the end of the meeting, they committed unanimously to a financial growth target to be achieved with the new tools of quality and customer satisfaction.
Conclusion

Top managers at Tidyman's believe that their achievements, in addition to those outlined above, have been considerable. Among the most important, they have changed their thinking about organizations and management. There is a greater appreciation for the corporation as a system and the rules of systems management and operation. Grocery people typically make decisions very quickly, sometimes “shooting from the hip”. Top managers report that they still make decisions rapidly, but that they bring new considerations into play, such as design questions, information gleaned from QFD and Hoshin Planning, and the effect of decisions on other parts of the system. Moreover, the tools of quality are often used in reaching decisions. Managers are also pleased that they have avoided the “analysis paralysis” reported to plague other companies which have undertaken TQM. They attribute this to the fact that they have avoided a bureaucratic approach to quality and have worked hard to keep decision-making in the organization as close to the front line as possible.

Everyone is familiar with the statement that “TQM is a journey, not a destination.” There is much that remains to be done. Even though the corporation has made powerful strides in its transformation, there is a sense that the change needs to put down deeper roots. Most of Tidyman's people have spent their entire professional lives operating in the now-abandoned, old ways. Executives realize that it is important to solidify their gains. In particular, it will be important to get greater Board understanding and support for the process. Management is concerned that if there is a financial slip, it will be all too easy to slide back to old practices.

Although project teams have identified real, documentable cost savings in their work, many of their decisions have yet to be deployed. Tidyman's executives very consciously chose to emphasize training in the use of the tools of quality. Executives have now decided that it is time to deploy those recommendations and bring the impact of quality to the bottom line. Another challenge, in the spirit of Lean Production and Service, includes shortening the cycle time for process improvement team work. Finally, the executives wish to become more skilled at selecting the most fertile areas for improvement.

Lessons learned

When asked about the most important lessons learned in this project, executives made several points:

• First, that thinking required for TQM is not as foreign as management had feared; it comes much easier than they had anticipated.
• Second, that top leadership commitment and involvement is absolutely essential to the success of TQM.
LESSONS LEARNED, CONTINUED

Third, that TQM will cause turmoil, which sometimes shows itself as personal challenges to management confidence.

Some exceptionally capable managers— schooled in the old ways— have asked themselves, “Can I make it in this company?” The change has been particularly difficult for middle managers, who were promoted into their positions for their skills in managing in the old way. Their fear of the unknown has required top management to spend considerable time counseling them individually, bolstering their confidence, and helping them to embrace the necessary changes. In that light, it is important for TQM leaders and consultants to differentiate carefully the problems of resistance to TQM, skepticism regarding TQM, and the difficult personal experiences of those managers and employees who actually are struggling to change.

For the most part, Tidyman’s managers are mastering the change, and the future looks bright.

AUTHOR INFORMATION

Jack Heuston, President and CEO of Tidyman’s Foods, has been with the firm for 26 years. An active community member, Mr. Heuston is Chairman of the region’s Economic Development Council. His awards include Outstanding Retailer, Governor’s Spirit of Community Award, and Central Valley School District Award.

Mike Davis, CFO of Tidyman’s Foods, has been with the company for a decade. Prior to that he was a CPA with a major public accounting firm. Mr. Davis is a graduate of Gonzaga University and has lived in Spokane for 18 years. He is active in the community, working with not-for-profit human service agencies on children’s issues.

William Olson is CEO of Effective Management Systems. He has been a management and organizational development consultant since 1980, specializing in management innovations for business, government agencies, and not-for-profit corporations. Using a systems approach, he has built a reputation as an expert in the organization and management of work.
Appendix: Tidyman’s mission

Tidyman’s Foods, Inc. Mission Statement

We offer people food and other products and services needed for daily living. We do this by listening carefully to our customers, anticipating needs, and supplying the highest quality products, services, and information. We welcome opportunities to enhance the quality of life of everyone living in the communities we serve.

The whole community is our customer.
We are committed to earning trust, and to building long term relationships based on trust. We do this by:

• Continually improving our products, our services, and ourselves
• Constantly searching for new products and services that better meet people’s needs
• Partnering with suppliers in ways that constantly build value for the Tidyman’s customer
• Working actively in our communities to improve the quality of life
• Cultivating a fun working environment in which Tidyman’s people can find great satisfaction in being with and serving everyone who comes into our stores
• Creating new opportunities for learning and growth, which encourage all at Tidyman’s to explore their potential.

In everything we do we will be guided by our shared sense of what is right.
Some Thoughts About Cultural Dynamics As Viewed From An Organizational Learning Perspective

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Abstract
In an effort to remain competitive in today’s environment, many firms are attempting to embrace recent marketplace innovations (such as Total Quality Management, TQM), only to find that implementation is lagging because corporate culture is not ready for such a change. This paper outlines a way to provide a framework to better understand the inhibitors and enablers of cultural change in support of organizational adaptation. The graphics represent the interplay between organization and marketplace components that are associated with organizational adaptiveness. These components include macro-representations of the fundamental elements of TQM with incremental and breakthrough modes of innovation. Insight into the dynamics of organizational adaptation is gained by studying the model utilizing the five disciplines of a learning organization. Finally, a few suggestions associated with bringing about organizational adaptation are briefly discussed.

Introduction
A survey of more than 200 firms over an 11 year period of time found that, “Firms with cultures that emphasize customers, stockholders, and employees, with leadership from managers at all levels, outperformed firms that did not have these cultural traits by a huge margin.” Differences cited were in the areas of revenue increase (682% vs. 166%), work force expansion (282% vs. 36%), stock price growth (901% vs. 74%), and net income improved (756% vs. 1%). Some benefits associated with modifying a corporate culture for increased customer focus are obvious. Unfortunately, how to accomplish such a culture change is not at all obvious (which may help explain why about one-third of the Fortune 500 companies present in 1970 had vanished by 1983).
A simple model

The following model is intended to be a graphical representation of the key internal and external components of the organization in its marketplace. In the words of George E. P. Box, “All models are wrong, but some are useful.” By graphically representing the interplay between organizational and marketplace components that are associated with organizational adaptiveness, this model provides a framework for better understanding the inhibitors/enablers of culture change. Beginning with the fundamental elements of TQM, the model will be constructed in stages.

The first stage: a diagram of the simple model

TQM begins with “Me, My Process.” I have a “Customer” and also a “Supplier.” “My Customer” provides me with feedback; I provide “My Supplier” with feedback as well (Figure 1).

Figure 1. A Simple Model: Total Quality Management Begins With Three Core Elements

```
My Supplier
  ↓
   ↓
Me,
My Process
  ↓
   ↓
My Customer
```

The second stage: adding to the base model

Eventually a product or service is provided to an “Outside Purchaser” (Figure 2). This “Purchaser” may also provide feedback to “My Customer,” “Me,” and “My Supplier.” Strong connections here will provide the workforce with both accountability and pride. Corporate management also listens to the “Purchaser,” and provides “Strategic Direction and Deployment Plans” to “My Customer,” “Me,” and “My Supplier.”

Figure 2. Further Development of Base Model
In response to corporate “Strategic Direction,” “My Customer,” “Me,” and “My Supplier” work to create “Incremental Breakthroughs” in our processes and results (Figure 3).

Progress on these “Incremental Breakthroughs” is provided to management so that the “Strategic Direction and Deployment Plans” may be monitored and modified as needed. Provided that no external changes occur, many companies could operate indefinitely in this steady-state flow.

Suppose, though, as shown in Figure 4, a major innovation or “Breakthrough” occurs. This “Breakthrough” significantly affects the marketplace and could be a result of a major change in economics, legislation, mental models, competition, or technology. Such a “Breakthrough” will have a dramatic impact on the buying habits of the “Outside Purchaser” and, if the corporation is to survive, should also affect “Strategic Management Direction and Deployment Plans.” At this stage, “cycle time” becomes a strategic issue. The “Breakthrough” may also be the end result of an intended “Incremental Breakthrough” which had a much larger marketplace impact than originally foreseen.

The model, as shown in Figure 4, represents a system involving various elements of an internal organization, incremental and breakthrough modes of innovation, and their effect on the outside purchaser.
There are a number of model interrelationships to be looked at. One is a system that deals with innovation and breakthrough.

Listening to the outside purchaser tends to be a primary motivation for corporate change.

If the culture of the internal organization is to change, what would the model suggest are the essential drivers for this change? Consider the various numbers of arrows in and out of elements within Figure 4, as shown in Table 1.

Table 1. Model Element Interrelationships

<table>
<thead>
<tr>
<th></th>
<th>Arrows Out</th>
<th>Arrows In</th>
<th>Out-In Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td>My supplier</td>
<td>2</td>
<td>3</td>
<td>-1</td>
</tr>
<tr>
<td>Me, my processes</td>
<td>3</td>
<td>4</td>
<td>-1</td>
</tr>
<tr>
<td>My customer</td>
<td>3</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>Outside purchaser</td>
<td>4</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Strategic mgmt. direction</td>
<td>3</td>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>Incremental breakthroughs</td>
<td>1</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>Breakthrough</td>
<td>2</td>
<td>0</td>
<td>2</td>
</tr>
</tbody>
</table>

This table suggests that the primary motivators for corporate change come from listening to the “Outside Purchaser” (Voice of the Customer) and/or a response to a “Breakthrough” in the marketplace.

When a true “Breakthrough” occurs in the marketplace, the world becomes a different place and the quicker management responds through modification of strategic direction and related deployment, the better. If, for some reason, management does not receive/respond to signals from the marketplace, management can sense the need to change by listening to the customer. Companies that are not listening to the marketplace environment or the customer are destined to be replaced by other companies with more customer focus.

In the absence of “Breakthrough,” management can continually improve
corporate competitiveness by anticipating/responding to the external state of the world as reflected in outside purchaser needs, and creating “Incremental Breakthroughs” or *kaizens*. Some of these “Incremental Breakthroughs” may become more significant than originally expected, creating a true marketplace “Breakthrough” that seriously impacts competition.

It is useful to consider the model elements in light of Peter M. Senge’s Five Disciplines of the Learning Organization. These disciplines are: Personal Mastery, Team Learning, Mental Models, Shared Vision, and Systems Thinking.

**1. Personal Mastery**

Personal Mastery is the discipline of “continuously clarifying and deepening our personal vision, of focusing energies, developing patience, and seeing reality objectively.” It involves balancing present reality with vision, and moving toward the vision. In the culture change model it is most closely aligned with “Me, My Process.”

**2. Team Learning**

Team Learning occurs when team members interact synergistically to produce extraordinary results over time, with individual members learnings growing more rapidly than could have occurred otherwise. Dialogue is central to the achievement of this synergy. The subset: *My Supplier, Me, My Process, and My Customer* provides a natural work-related illustration of a learning team producing incremental breakthroughs (Figure 6).
3. Mental Models

Mental Models are deeply ingrained assumptions, generalizations, or images that influence how we understand the world and take action. In the culture change model (Figure 7), mental models involving “Strategic Direction” with marketplace “Breakthroughs” and “Outside Purchasers” are very important.

4. Shared Vision

Shared Vision involves holding a shared picture of the future we wish to create. For true culture change to occur, a shared vision must exist between those involved in “Strategic Management,” “Me, My Process,” “My Supplier,” and “My Customer” (Figure 8).

5. Systems Thinking

Systems Thinking is the ability to form a conceptual framework to deepen understanding of interrelated patterns among system elements, and make the full pattern clearer so that the system may be changed effectively. As such, the entire model (Figure 4) is involved in systems thinking.

Example scenarios for the model

The model has been studied by considering the following scenarios: a carburetor builder affected by fuel injection, impact of low-fat and no-cholesterol diets on dairy/meat industries, a mainframe computer manufacturer missing the PC revolution, development of a lead flotation process for making plate glass (making grinding obsolete), automakers facing the oil crisis and underestimating the impact of the small car, the introduction of lower cost acrylonitrile on the rug market, development of a...
Relationship to the "five disciplines of the learning organization," continued

Consider a carburetor manufacturer before fuel injection. The system operates in a fairly steady-state flow with teams of suppliers, individuals, and internal customers working together per a prescribed strategy to deliver products with small incremental improvements to outside purchasers. Now suppose that a technology breakthrough occurs in the form of fuel injection (developed by a team from another corporation as an improvement in their strategy). Unapparent as yet, fuel injectors will essentially replace carburetors in the future marketplace, as customers perceive a better product and respond accordingly by their purchase decisions. One option is for management to understand and react to the breakthrough in technology by revising the corporate vision from “carburetor manufacturer” to “manufacturer of fuel delivery systems.” A new strategy and associated culture would be created to compete in the marketplace. If management does not react directly to the breakthrough in technology, they may still receive information on the breakthrough condition indirectly by understanding and reacting to the wishes of the “outside purchaser.” A third option for management is to not pay attention to information concerning technology and/or the outside purchaser. Over time, market share will decay and the corporation will eventually cease to exist.

In the above example, it is to the benefit of the carburetor manufacturer to strengthen connections between strategic management/breakthrough, and strategic management/outside purchaser. It is when information flow from these areas is weak that the corporation loses opportunities for growth. For the company who originally created/initially supplied fuel injection, the more they can convince competition that their corporate incremental breakthrough is not a true marketplace breakthrough, the more time they will have to outdistance the competition.

Other scenarios are similar, with the proviso that the nature of the breakthrough/industry is different. In the dairy industry, for example, a mental model breakthrough that eggs are poor for health due to cholesterol may spur development of alternative competition.
The model suggests that the ability of management to acknowledge and respond to changes in the marketplace environment and the needs of outside purchasers is vital to long term corporate health. In addition, these two links to strategic direction are powerful motivators for corporate adaptation, and may be strengthened by enhancing management’s ability to work with mental models. In this regard, the concepts of camp versus hierarchy and double-loop learning are especially relevant.

Bruce Gibb’s concept of "camp" vs. "hierarchy"

The concept of camp versus hierarchy was first introduced by Bruce L. Gibb of Bruce Gibb and Associates in work he was doing with Ford Motor Company. Dr. Gibb observed that primitive tribes would gather around a campfire for the purpose of strategic planning and developing alignment. Around the campfire, rank had little meaning. Everyone in the tribe was treated as an equal for the purposes of thinking and reflecting aloud on team-related issues such as tomorrow’s hunt. In the camp, the leader modeled learning with a willingness to share and listen. Everyone in the tribe treated each other with mutual respect and was able to dialogue and explore issues without the tribe necessarily reaching consensus. In this manner, the beliefs/values of the organization were shared and discussed. When it came time to act, to hunt for food, plans were executed with rigid, disciplined directives. The leader would assign tasks and follow-up to assure they were completed. These concepts are illustrated in Figure 9.

Figure 9. Bruce Gibb’s Model of Camp vs. Hierarchy

The tribe functioned by alternating between camp meetings (planning) and hierarchy (execution). The camp/hierarchy model has application when considering mental models and culture change. When management meets for planning strategic direction, a camp meeting format will be utilized to dialogue with open architecture and truly explore/alter mental filters using input/observations gathered from everyone in the meeting. After planning, deployment is then conducted in a hierarchical manner.
Bruce Gibb's concept of "camp" vs. "hierarchy," continued

Applied to an organization, culture change is a bottom-up and top-down phenomenon.

Looking at the concept of "double-loop learning" in a "camp" environment illustrates opportunity for culture change.

When top management meets, each person in the meeting may represent thousands of employees in the corporation. If each area of the corporation is also conducting camp meetings, then all leaders can bring with them a broad range of perspectives to explore and discuss before making decisions. After all, in the culture change model, customers are providing feedback to many areas of the corporation.

Traditional organizations only discuss this information cross-functionally in small camps where organization boundaries overlap. In performing strategic planning, why not use all input from everyone? This could be accomplished in a series of nested camp meetings culminating in a top management meeting established to determine strategic direction. Such a scenario, shown in Figure 10, could answer the question, "Does culture change move from top down or bottom up?" If an organization is using the camp/hierarchy approach, one might answer "yes" to both.

**Figure 10. Concept of a Nested Series of Camp Meetings to Promote Culture Change**

Chris Argyris' model of double-loop learning, shown in Figure 11, illustrates the opportunity for culture change/learning that exists in the camp environment. Management must periodically meet to consider the external market environment and outside purchaser input, and compare results from incremental breakthroughs with what was originally intended in the plan. In this camp meeting, not only can learning be accomplished by reviewing results from actions, but learning can also occur by
Looking at the concept of "double-loop learning" in a "camp" environment illustrates opportunity for culture change, continued examining governing values, shared assumptions, and beliefs. In this manner, information from breakthroughs and outside purchasers has the greatest probability of being heard and accepted into deployment of a new vision and associated culture.

**Figure 11. Chris Argyris' Model of Double-Loop Learning**

![Diagram of Double-Loop Learning]

**Conclusion:** We gained some understanding of the dynamics of culture change, and identified some questions for further work.

Further study is intended to relate model implementation to concepts such as Strategic Information Systems, and Organizational Design. Policy Management, a TQM tool to systematically deploy breakthrough actions with measures throughout an organization, is a natural complement to the above ideas once the initial planning is completed.

This paper/model was developed to gain an initial understanding of culture change and to explore the relationship between culture change, innovation, and TQM. The associated bibliography is provided so that, together, we may achieve further knowledge and develop the necessary skills and competence to change culture and improve corporate performance.

**Notes**


**Other selected references and abstracts for further study**


The systems revolution is socio-technical and leads to holistic planning and control of the future. The role of the corporation and us all, in the marriage of science and the humanities, should be understood to solve the problems of society.


Means of increasing the responsiveness of organizations to change are suggested. Focus is on designing a flexible organization as a first step in adaptability.


Today much corporate planning is like a ritual rain dance. “Chief Bottom Up” initiates goal-oriented input starting at the very bottom levels of management, or “Chief Top Down” lays out corporate objectives and provides lower levels of management with broad strategies for pursuing them. The results are a poorly organized hodgepodge of ideas and actions.

Effective planning should not be reactive or retrospective or proactive or prospective. It should be interactive or introspective. The basic approach of the interactive planner is to “make it happen.” He is unwilling either to return to a previous state, settle for his current state, or accept the way things are going. Unlike the other two types of planners, the interactive planner believes that the future is largely under an organization’s control. Therefore, he conceives of planning as the design of a desirable future and the invention of ways to bring it about. This is more effective than rain dancing.


Very few firms have been able to integrate the financial, marketing, and production activities of the business into a truly representative simulation model. Models can be used to help planning, but that fact does not make them true planning models. Another way of understanding planning is to define it as a process of dealing with problems.

Problems can be approached in three ways: problem resolving, problem solving, or problem dissolving. Three approaches to planning are summarized: clinical, research, and design.

The clinical approach treats a problem holistically. The planner serves as a non-directive convener. The research approach analyzes a problem, identifying its parts and their relationships. The design approach, a synthesis of the clinical and research approaches, has five steps:
1. formulates the problem,
2. sets ideals,
3. selects methods,
4. coordinates resources, and
5. designs implementation and control mechanisms.
However, most corporate planning has no effect on the resulting performance of the firm. However, those who perform the planning think they are in control.


Most firms need to formulate or reformulate their mission statements. A mission statement should not commit a firm to do what it must do in order to survive, but to what it chooses to do in order to thrive. A good mission statement should:
1. formulate the firm’s objectives and enable progress toward them to be measured,
2. establish the individuality of the firm and differentiate it from other companies,
3. define the business that the company wants to be in, not necessarily the business that it is in,
4. be relevant to all the firm’s stakeholders, including employees, customers, suppliers, and the public, and
5. be exciting and inspiring.

It should motivate all those whose participation in its pursuit is sought. A test for the appropriateness of an assertion in a mission statement is to determine whether it can be disagreed with reasonably. If not, the assertion should be excluded from the statement.


The concept of the circular organization was developed to address the following needs:
1. to operationalize organizational democracy,
2. to increase the readiness, willingness, and ability of organizations to change, and
3. to improve the quality of working life.
The circular organization’s central idea is that every person in a position of authority, i.e., every manager and supervisor, is provided with a board that includes:
1. the manager,
2. the immediate superior, and
3. the immediate subordinates.
Boards usually have the following responsibilities:
1. planning and policy making for the unit whose board it is,
2. coordinating the plans and policies of the next lower level,
3. integrating its plans and policies, and
4. decision making.
In the early 1980’s, boards were introduced in Alcoa’s Tennessee operations, which were suffering from low product quality and poor productivity. Within two years, improvements were sufficient to warrant a modernization program.


An increasing number of problems being faced currently have few or no precedents, resulting in a decreasing number of chances to solve them effectively in familiar ways, and creating a greater need for new ways of doing things and greater creativity to discover these new ways. Creativity is in short supply and inequitably distributed. This study offers a
Other selected references and abstracts for further study, continued

selective review of the relevant literature on creativity, its availability, and ways to improve its distribution. Succeeding segments of the review:
1. Consider what others have written about the nature of creativity,
2. Review a number of processes that have been suggested for enhancing creativity in the areas of planning and problem solving,
3. Synthesize the conceptual work reviewed into an operationally meaningful definition of the concept, while relating the creativity-enhancing processes to it, and
4. Survey the research executed and suggest what future work is indicated.

Specific procedures for enhancing creativity include synetics, brainstorming, TJK, and the Search Conference.


Suggested models to sharpen adaptability to change, and to work with the system and others to implement change toward a common end.


Discussion of how to identify, nurture, and shape the cultures of organizations in any stage of development, to achieve goals and fulfill missions.

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Mr. Smith has published several case studies in Designed Experiments and Quality Function Deployment. He also teaches courses in Designed Experiments and Statistical Methods for Wayne State University and the Cast Metals Institute.
Transferring Quality Knowledge Into German Small and Medium-Sized Enterprises
- A State Of The Art Survey -

Klaus J. Zink and Reimund Hauer, University of Kaiserslautern, Germany

Introduction

When looking at German companies in general, it seems to be obvious that they are attaching a higher importance to Total Quality Management (TQM) and its implementation, than they were a few years ago. On the one hand this statement is based on some empirical studies that have been carried out recently. On the other hand, additional examinations reveal a great number of commercial and non-commercial seminars and training courses dealing with TQM. In this research report we examine and discuss how far these results could apply to German Small and Medium-Sized Enterprises (SME).

Background

In Germany the economic performance of Small and Medium-Sized Enterprises has a strong influence on the whole economic situation:

- About 95% of German companies employ less than 500 people
- German Small and Medium-Sized Enterprises account for 40% of the entire industrial revenue.

We also know from practical experience that Small and Medium-Sized Enterprises have more problems in adopting organizational changes than larger ones. Some typical reasons for this are:

- A lack of resources (personnel, finance and time) to maintain specialized service departments (strategic planning, human resources, quality management) or a full infrastructure
- A lack of resources to implement "new" technologies, such as Computer Integrated Manufacturing (CIM) or Management Information Systems (MIS)
- Obsolete organizational structures and principles of management
Background, continued

- Less acceptance of team work (quality circles, task forces) and self-regulating work groups
- Informal atmosphere instead of clearly defined roles, requirements, standards and measurement.

Research study objectives

A 1993 survey carried out by the Research Team “Concepts for Transferring Knowledge of TQM” might help one understand to what extent Small and Medium-Sized Enterprises have adopted TQM or not. Before describing the important results of this work, however, the three basic objectives of the survey should be stated:

1. To gain a representative overview of how extensively German industries have accepted the idea of TQM and implemented it further to include all categories and size of enterprise and as many industries as possible.
2. To include additional aspects of commercial and non-commercial TQM training (for example, instruction methods, contents of TQM training courses, and their development for special target groups).
3. To identify the relevant factors that have a significant influence on the success of implementing TQM.

This paper is divided into three sections

Before summarizing key results, it is necessary to describe the theoretical background (relevant items, population, and sampling issues) of the survey. We will then discuss important issues concerning the implementation of TQM, with a special focus on Small and Medium-Sized Enterprises. The identification of critical success factors and some final remarks will conclude this paper.

1. Theoretical background

First of all, a questionnaire containing all relevant items to describe the knowledge about TQM and its transfer had to be developed. The questionnaire included selected categories of the European Quality Award (for example, process management, customer focus, people management and results), as well as important items of the ISO 9001 (for example, prevention, statistical tools, quality control, registration, product safety and liability) (see Figure 1).
We then determined the sample of the survey—a random selection of 3,382 companies representing 28 industries and all categories of size of enterprise in Western Germany. The chief executives of the companies were selected as contacts for this written survey. (We assumed that management knowledge of TQM is an important indicator as to what respect TQM has been implemented within the organization.)

Second phase: case study of 15 companies

After evaluating the responses of this cross-section study, a second survey was started. Fifteen companies which had expressed their willingness to participate, and which had stronger experience in implementing TQM, were selected from the response sample to evaluate the transfer of knowledge by case studies.
Case study of 15 companies, continued

Each case study included:

• Five to seven interviews with selected staff members (chief executives, heads of the quality department and of the human resources department, selected workers, and others when necessary)
• A plant visit
• An examination of instruction materials and quality handbooks
• Finally, the results of the cross-section study as well as the experiences which have been documented in fifteen case studies were summarized, and the critical success factors for the implementation of Total Quality Management have been indentified.

2. Selected Results of the Survey

Besides the scope of knowledge concerning quality related business strategies, and the experiences with quality management, the evaluation of the cross-section study and the case studies has identified three areas for improvement in German companies in all:

• Customer focus and customer satisfaction
• People management and people satisfaction
• Process management and process improvement.

In addition to these items, three special problems concerning the implementation of TQM in Small and Medium-Sized Enterprises may be traced:

• Ratio (quality measurement) systems of quality control
• Prevention, the use of statistical tools, quality inspection/testing
• Registration of quality system, i.e., ISO.

In the following pages these areas for improvement will be described.

2.1 Scope and status of Total Quality Management

The scope and status of TQM can be suggested by three factors: the response rate to the survey (see Figure 2), the reasons for a negative reply (see Table 1), and the knowledge of any quality management strategy, such as TQM, Kaizen or Continuous Improvement Programs (CIP).
Table summarizing sample size and response rates

Table 1: Response rate and reasons for negative reply

<table>
<thead>
<tr>
<th>Sample:</th>
<th>100% (n = 3382)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Response rate:</strong></td>
<td></td>
</tr>
<tr>
<td>• in all:</td>
<td>33% (n = 1121)</td>
</tr>
<tr>
<td>• in detail:</td>
<td></td>
</tr>
<tr>
<td>• not to evaluate:</td>
<td>9% (n = 307)</td>
</tr>
<tr>
<td>• founded negative reply:</td>
<td>12% (n = 409)</td>
</tr>
<tr>
<td>• questionnaires to evaluate:</td>
<td>12% (n = 405)</td>
</tr>
<tr>
<td><strong>Reasons for negative reply (n = 409, multiple response):</strong></td>
<td></td>
</tr>
<tr>
<td>• too small:</td>
<td>66%</td>
</tr>
<tr>
<td>• contents not applicable:</td>
<td>39%</td>
</tr>
<tr>
<td>• lack of time:</td>
<td>24%</td>
</tr>
<tr>
<td>• other:</td>
<td>7%</td>
</tr>
</tbody>
</table>

With regard to the response rate, many companies, especially small ones, cited the small size of the enterprise (66%) and the contents of the questionnaire (39%) as their main reasons for not answering. But as the questions were not too specific, the management of smaller companies or service industries, like banking, which traditionally have not dealt with TQM in the past, should nevertheless have been able to answer the questions as well as the management of somewhat larger companies.

For this reason we can conclude that quality management is often of no interest to smaller companies, as well as for several industries like leather and footwear, textile and apparel, or construction.

The knowledge scale of quality management strategies is obviously dependent on the size of enterprise (see Figure 3). Twenty-eight percent of the management of the companies with less than 100 employees know any quality management strategy such as TQM, Total Quality Control (TQC), Continuous Improvement Programs (CIP) or Kaizen. It is also important to note that only 51% of the persons asked indicated any knowledge of these business strategies.

However, the interest of larger companies (more than 1,000 employees) in Total Quality Management is strong. Comparing these results to a cross-section study that Zink and Schildknecht carried out in 1989, the percentage of companies espousing some kind of knowledge about TQM has increased from 84% to 97%.\(^10\)
2.1 Scope and status of Total Quality Management, continued

Customer-supplier relationships well accepted

Customer focus is an exceptionally important element of Total Quality Management. Due to this significance, customer focus has been taken into account in this survey by two items:

1. Description of the companies’ situations by selected statements (see Figure 4)
2. Regular analysis of customer satisfaction (see Figure 5).

First of all there is a strong awareness of the significance of customer-supplier relations among the management of all companies. There is no evident gap between the situation in Small and Medium-Sized Enterprises and in larger enterprises.
2.2 Customer focus, continued

Figure 3: Smaller enterprises have a lower percentage of people who are knowledgeable about quality management.

Internal-external customer idea is not well accepted in small enterprises

Customer satisfaction analysis is rare in small organizations

Compared with this, awareness concerning the existence of external and internal customers is different. Smaller companies (especially those with less than 200 employees) have adopted this point of view only very rarely.

Besides an awareness of the perception of customers' needs, the method of identifying and improving the status of relationships with customers was also examined. In this context one important tool is the regular analysis of customer satisfaction (for example, the identification of complaint levels, customer returns, or re-work levels). On average, about 15% of the companies asked, had carried out such examinations. Only some 5% of the smaller companies (less than 100 employees) use customer satisfaction analysis in any way. Of course, there exists a difference between larger and smaller
2.2 Customer focus, continued

companies in the ways of analyzing customer satisfaction. A written, or regular, questionnaire for example, does not seem to be viable for smaller companies for economic reasons.

Nevertheless, it is necessary for smaller companies to analyze customer satisfaction somehow or other. This statement is confirmed by the results of the case studies mentioned above. In one instance\textsuperscript{11} every customer visit was documented by a responsible employee using a check list. One result of analyzing these forms is that a customer satisfaction rate can be determined monthly.
2.2 Customer focus, continued

Benchmarking customer satisfaction

Another gap between the awareness of customers’ needs on the one hand, and its realization on the other, becomes apparent when discussing the use of Benchmarking as a tool to compare one’s own customer satisfaction rate with that of one’s competitors. On average, only 8.5% of the total number of companies questioned, and 3% of smaller companies (less than 100 employees), have already applied this tool.

2.3 People management and people satisfaction

In a similar way to customer focus, companies’ orientation towards the needs of their employees meets the necessary requirements only very rarely. Clearly, a focus on people management in smaller companies especially (less than 200 employees) does not reach the required standard (see Figure 6). Consequently:
2.3 People management and people satisfaction, continued

- A determination of the training requirements for all the employees in a company has not been carried out
- Self-checking to promote autonomy in production, as well as in service departments, exists only in the initial stages
- Although German companies have had a lot of experience with Quality Circles or task forces since the beginning of the 80s, motivation by teamwork is of minor significance for small and medium-sized enterprises.

People satisfaction is an important consideration for all companies, but how can this be achieved without a knowledge of their needs and expectations? Surveys, offering one possibility to analyze people satisfaction, should be carried out in order to gain a more definite idea of the view which their staff holds, and alter that anonymous staff opinion. On average only 12% of the companies questioned have indicated that they use staff opinion surveys regularly. Of the enterprises with less than 200 employees, only 5% use this tool. An even smaller proportion, 4% of the companies asked, use

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**Figure 6: Smaller enterprises want employee participation but self-testing is rarely realized**

**Figure 6: People management - exemplary items**

[Graph showing data on people management aspects]
2.3 People management and people satisfaction, continued

Benchmarking to compare one’s own people satisfaction with that of other firms.

Similar to the analysis of customer satisfaction, the design of a staff opinion survey, or the determination of training requirements in smaller companies is different from that of larger ones. Nevertheless the results of our case studies show that smaller companies as well as larger ones are able to adopt the ideas of people management and people satisfaction.12 Two highlights are:

- Self-checking by production workers to reduce defect rates
- Permanent determining of the training requirements of workers through the use of check lists.

2.4 Process management and process improvement

The focus of management on identifying and improving key processes is an important element of various business strategies like Total Quality Management, Lean Production, or Business Re-engineering. Therefore four significant items that specify process management have to be identified:

- A concentration exists on the quality of processes and the methods/tools used to measure it (process performance measurement)
- Critical processes, sub-processes and their interfaces are described and process ownership is established
- The impact on the business is evaluated
- Strategies to shorten product development time are established (for example, Simultaneous Engineering).

The results of the cross-section study show that the quality of processes is of less importance in smaller companies (less than 100 employees) than in larger ones (see Figure 7). Obviously the correlation between the quality of products and the quality of processes is unknown.

Furthermore, the management of key processes and their impact on business and process performance measurement are also areas for improvement by smaller companies. Only 13% of all companies asked and merely 3.5% of the smaller companies (less than 100 employees) had recorded ratios to measure the process capability. When analyzing the results of the case studies the same problems as mentioned above were found.
5. Special problems of Small and Medium-Sized Enterprises with implementing TQM

Customer focus, people management, and process management are areas for improvement which more or less all concern categories and sizes of the enterprise. But special problems can be identified which apply only to smaller enterprises:

2.5.1 Ratio (measurement and tracking) systems of quality control (for example, cost of quality):

Only 10% of companies with less than 200 and more than 20 employees, and merely 5% of companies with less than 20 employees, are recording ratios to control their quality systems.

2.5.2 Prevention:

Quality planning, failure analysis, process improvement methods (for example Failure Mode and Effects Analysis) are very often unknown, or of less importance for smaller companies (less than 100 employees).
2.5 Special problems of Small and Medium-Sized Enterprises with implementing TQM, continued

2.5.3 Quality inspection:
This “traditional” area of quality assurance especially shows the gap between the importance of product quality on one hand, and its application on the other. In many companies, systematic inspection planning is missing and testing procedures are rarely fixed. In these cases, tests and testing results are incomprehensible.

2.5.4 Statistical Quality Control:
About 33% of the smaller companies with less than 200 and more than 100 employees use Statistical Quality Control, (only 13% of companies with less than 100 and more than 20 employees and only 3% of companies with less than 20 employees).

2.5.5 Registration of the quality system:
The importance of registration for German companies has rapidly increased during the last few years. 50% of the companies surveyed had already dealt with registration. The interest in certification depends on the category of size of the enterprise (merely 17% of companies with less than 20 employees had discussed the importance of a certified quality system). 9% of the companies asked have a quality system certified by ISO 9000 or by another assessment model. Besides that, it is necessary to discuss critically how far a quality system certified by ISO 9000 can forward the competitiveness of small companies.

In conclusion, the results of the cross-section study and the case studies mean that various critical success factors have been identified, which especially apply to Small and Medium-Sized Enterprises. In the following, selected factors are mentioned:

1. Implementing a quality strategy:
- Relationship to practical experiences with TQM:
  Exchange of experiences and use of information data bases to learn from experiences of others often fail to occur in Small and Medium-Sized Enterprises.
- Support by management:
  Management of Small and Medium-Sized Enterprises is required to take multiple roles. That’s why support of management often is poor.
- Early involvement of all employees and the Works Council:
  Directive style of leadership is predominant and hinders participation.
- Policy deployment and objectives for all employees:
  A written corporate culture, a corporate strategy, and a clearly defined quality strategy often fail to occur in Small and Medium-Sized Enterprises.
Critical success factors for implementing TQM in SME, continued

2. Customer focus and customer satisfaction:
   - Awareness of customer focus:
     Small and Medium-Sized Enterprises seem to have a closer contact to their customers and a stronger awareness of their customers’ needs than do larger firms. It also depends on the industry the companies belong to (for example, a supplier to the automobile industry versus trade).
   - Measuring customer satisfaction and information of employees’ concerns:
     The resources to apply Benchmarking or a regular customer satisfaction analysis are often not provided in Small and Medium-Sized Enterprises.
   - Internal and external customer-supplier relations:
     Clearly defined communication and information structures, as one important source to define customer-supplier relations, are rarely established.

3. People management and people satisfaction:
   - Involvement and motivation by team work:
     A lack of resources to implement team structures and directive style of management hinder involvement and team work.
   - Determination of training requirements:
     Human resource management has been misunderstood as personnel administration.
   - Suggestion system with clear criteria:
     Analysis of case studies shows that it has not been established in any company with less than 500 employees. Clearly defined criteria do not seem to exist.
   - Self-checking and autonomy in production as well as in service departments:
     Analyzing training needs and requirements, and support of management, often fail to occur.
     Lack of knowledge of innovative job design principles has been recognized.
   - Staff opinion survey and a clear strategy to settle grievances immediately:
     Not clearly defined structures on one hand, versus knowledge of staff opinion on the other.
   - Further information about people satisfaction (absenteeism and sickness, staff turnover):
     Quality information system rarely exists in smaller companies. People believe they know everything about each other.
   - Payment system and its relation to the TQM objectives:
     Recognizing traditional payment and reward systems (piecework rate, time rate plus premium wage).
Critical success factors for implementing TQM in SME, continued

4. Process management and process improvement:
   - Key processes for product and service functions
   - Permanent improvement
   - Information of all people who are involved
   - The role of the quality assurance department as a consultant in process management.

   A lack of knowledge of innovative process management and process improvement strategies has been recognized especially for SME’s.

5. Focus on results:
   - Ratio (measurements, tracking) system for quality control
   - Knowledge of the cost of quality
   - Knowledge of other ratios, for example people satisfaction, customer satisfaction, and process capability.

   A quality information system rarely exists in smaller companies.

4. Conclusion

   In conclusion, one can say that, in general, German companies have a strong awareness of the perception of their external customers. Nevertheless the transfer of customer focus fails very often. The same gap between philosophy on the one hand and implementation of TQM on the other also exists in the area of process management, process improvement, people management, and people satisfaction. Additionally, special problems such as quality measurement, Statistical Quality Control or problem prevention have been identified as typical for Small and Medium-Sized Enterprises.

   The research program “Quality Assurance 1992 - 1996” sponsored by the Federal Ministry of Research and Development is dealing with these problems. The transfer of knowledge between the research groups and SME’s especially should be driven forward in order to close the gap between “talking” and “acting.”

Notes


2. The Research Team “Concepts for Transferring Knowledge of TQM” has been sponsored by the Federal Minister of Research and Technology since July, 1992 (No. 08F80001). Team members are Prof. Dr. Klaus J. Zink (University of Kaiserslautern, having overall charge), Prof. Dr.-Ing. G.F.
Notes, continued

Kamiske (IWF Department Quality Science, TU Berlin), Prof. Dr. D. Leutner (Faculty of Psychology, University of Gießen), Prof. Dr.-Ing. T. Pfeifer (Fraunhofer Institute IPT Aachen, Department Testing and Quality Assurance), Prof. Dr.-Ing. H. Schnauber (Faculty of Ergonomics, University of Bochum) and Prof. Dr.-Ing. D. Specht (Fraunhofer Institute IPK Berlin, Department Instruction Methods).

3 In the context of the survey "implementation" is going to be used synonymously with "transferring of knowledge."

4 In the context of the survey "size of enterprise" is going to be used synonymously with "number of employees."


7 The design of the questionnaire has been a team effort of Prof. Dr. Klaus J. Zink (University of Kaiserslautern), Prof. Dr. D. Leutner (Faculty of Psychology, University of Gießen) and Prof. Dr.-Ing. T. Pfeifer (Fraunhofer-Institute IPT Aachen, Department Testing and Quality Assurance).

8 While preparing the survey no representative address files of companies with a registered office in Eastern Germany were available.

9 In the second stage of the survey, companies with a size of between 100 to 1,000 employees were involved.


Journal of Innovative Management
**Author information**

**Dr. Klaus J. Zink**, born in 1947, has been Professor at the University of Kaiserslautern (Chair for Industrial Management and Human Factors) since 1980. Main fields of interest: new forms of work organisation (work structuring, organisational development), ergonomic aspects of new technologies (e.g. new technologies and rehabilitation), Quality Management, among others numerous publications on the themes of Quality Circles (QC) and Total Quality Management (TQM), national and international consultancies; since 1989 director of the Institute of Technology and Work; since 1992 speaker of the Research Center for Quality Management at the University of Kaiserslautern (among others member of the jury of the European Quality Award between 1992 and 1995).

**Reimund Hauer**, born in 1962, has a degree in Industrial Engineering and Management. Since 1989 he is an assistant lecturer at Prof. Zink’s Chair. Main fields of interest: coordinating various TQM projects (for example the interdisciplinary research team “Concepts for transferring knowledge of TQM” sponsored by the Federal Ministry of Research and Technology (evaluation phase)), implementing Total Quality Management in various industries, education and training in TQM, Software Quality Management.
Prioritization Matrix Variations Grow In Popularity In Making Rational, Supportable Solutions

Author

Michael Brassard, Director of Product Development, GOAL/QPC, Methuen, Massachusetts

Using "Prioritization" or "Decision" Matrices

The "Prioritization" or "Decision" Matrix tool was developed by GOAL/QPC, loosely based on the work of Thomas Saaty1 as a starting point. The matrices prioritize tasks, issues, product/service characteristics, etc., based on known weighted criteria using a combination of Tree and Matrix Diagram techniques. They build on the power of involvement while increasing the consistency of the decision making process.

While matrix-based decision making is not new, two variations have grown in popularity since they were introduced in The Memory Jogger Plus+ in 1989—-the Full Analytical Criteria Method and the Consensus Criteria Method. This paper discusses and explains these new variations.

The challenge–a key to success today–is the ability to make rational decisions quickly and to have them executed cleanly. This requires a systematic and repeatable decision making process that is based on the knowledge and input of those involved in the execution of that decision. The flow would be like this: from involvement comes information, from information comes knowledge, from knowledge comes understanding, from understanding comes commitment, and from commitment comes consistent and efficient execution of the plan.

Today’s business, political, and social environment is unforgiving. In the past, there has been a certain margin for error around both the quality and the execution of decisions. For example, health care organizations could enter an area of subspecialty (i.e. oncology, trauma units, etc.) and find out a year later that the demand just didn’t materialize. A microchip manufacturer could delay the introduction of a key product and not be hurt too badly. In today’s market, however, that health care provider could become the target of a takeover (friendly or otherwise), and the chip manufacturer could find itself a second-tier supplier.

The challenge—a key to success today—is the ability to make rational decisions quickly and to have them executed cleanly. This requires a systematic and repeatable decision making process that is based on the knowledge and input of those involved in the execution of that decision. The flow would be like this: from involvement comes information, from information comes knowledge, from knowledge comes understanding, from understanding comes commitment, and from commitment comes consistent and efficient execution of the plan.

Involvement alone does not guarantee improved decision making

The theoretical tie between involvement and support for decisions is hardly a new one. However, this involvement often occurs in unstructured and unfocused ways. Typically, a team is formed, meetings are held and decisions are made. The assumption is that a better decision will result because people were “involved.” Do they? Sometimes.

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Prioritization Matrix Variations Grow In Popularity In Making Rational, Supportable Solutions

A tool that is growing in popularity among our clients is the use of two Prioritization Matrices—Full Analytical Criteria Method and Consensus Criteria Method. They are specialized forms of the simplest type (L-Shaped) matrix diagram. When using this or any tool, however, it is important to remember that at some point in any planning or problem-solving sequence, progress must be the result of conscious decision making. In other words, someone has to decide what is most important to the organization at that time and then apply those priority considerations to the options under discussion.

Full Analytical Criteria Method versus Consensus Criteria Method

The Full Analytical Criteria Method (FACM) consists of matrices that allow a team to directly compare the relative importance of criteria, the merits of all of the available options based on each criteria and to then choose the option(s) that fare best across all criteria.

The Consensus Criteria Method (CC) is another matrix-based methodology that shares the same general features as the FACM, but uses individual ratings and rankings rather than direct comparisons in the weighting of criteria and in the selection of the top rated option(s).

Both methods are clearly based on the principle that a rational decision is only as good as the criteria that are used by the decision-making team. Without clear consensus on the criteria to be used (and their relative importance) the process is entirely open to the conscious and unconscious biases of every member of the team. How do we determine when we have such criteria?

1. When there are clear operational definitions that are accepted by the team.
2. When the criteria reflects the true range of considerations; that is, no unspoken criteria.
3. When they are manageable in number, typically 4-6 maximum.
4. When they have some distributed relative importance; that is, no one criterion completely overwhelms the other criteria in importance.

Regardless of which of the two methods you use, the overall process is the same. The flow chart shown in Figure 1 represents this process flow. The difference lies in how each step is executed. Here’s how the process works:

I. Steps One through Three are identical when using either type of matrix:
   - Step One: Agree on the goal.
   - Step Two: Choose a workable number.
   - Step Three: Create a weighting scale.

II. In Step Four, Compare and calculate weight for criteria, the two methods differ significantly:
   - In the Full Analytical Criteria Method (FACM), weighting is done by systematically rating the relative importance of every criterion as compared with every other criterion. This pairwise comparison forces the team to answer repeatedly
Flowchart for both the Full Analytical Criteria and the Consensus Criteria methods

Start

Agree to use FACM* or CCM**

Step 1
Agree on the goal

Do criteria exist?

Yes
Choose a workable number

1A

No
Generate list

Step 2

2A

Define each criterion

No

Are criteria defined?

Yes
Create weighting scale

Create an option matrix for each criterion

Step 3

Compare and calculate weight for criteria

Step 4

Rate options by criteria

Calculate and transfer score per option

Step 5

Build summary matrix

Step 6

Choose best option

Step 7

More criteria to rate?

Yes

Step 8

Transfer criteria weight scores

Step 9


FACM = Full Analytical Criteria Method
CCM = Consensus Criteria Method

Process differences explained, continued

questions: “How important is Criterion A as compared with Criterion B? How important is Criterion A as compared with Criterion C? etc., etc.” This would be repeated for all criteria.

• In the Consensus Criteria Method (CCM), each member of the team simply distributes an agreed upon value (i.e. 1.00) across all of the criteria. These individual ratings are then totaled and converted to either an average or percentage score.

III. The two methods differ again in Step 6, Rate options by criteria. Both methods create one matrix per criterion in which the team compares all of the options as they relate to that criterion.

• In the Full Analytical Criteria Method (FACM), the team asks, “How does Option #1 compare to Option #2 based upon Criterion A? How does Option #1 compare to Option #3 based upon Criterion A? etc., etc.”

• In the Consensus Criteria Method (CCM), rather than a paired comparison each team member ranks all of the options based upon each criterion. This may not seem like a major methodological difference, but it entirely changes the dynamics of the process. The FACM creates a systematic “confrontation” between choices, while the CCM builds on the perceptions and rankings of the team as a whole.
Highlighting the strengths and weaknesses of the two methods

Following, is a more in-depth comparison of the strengths and weaknesses of each method.

**Full Analytical Criteria Method**

**Strengths**
- This method forces a team to compare each criterion and option to every other criterion and option. This method is superior to a general discussion because it allows the team to make detailed comparisons and conclusions, whereas a general discussion will tend to ramble, lose direction, or go in circles.
- Breaks down a large number of factors and choices into individual decisions. These decisions can be made thoroughly by using the matrix to focus on just one “cell” at a time.
- Uncovers very basic assumptions and biases of team members when directly comparing and weighting criteria.
- Reduces the chance that any one individual will “push through” a pet project or specific criteria.

**Weaknesses**
- Can be very time consuming, especially when the criteria and/or options are controversial or when the team members have a high personal stake in the outcome.
- The process can create intense conflict, which may be a new experience for many teams.
- Requires more skilled facilitation than most of the other tools because of the need to deal positively with conflict and to maintain a high quality discussion throughout the process.

**Consensus Criteria Method**

**Strengths**
- Provides a quick way for a team to build on the consensus around the criteria, which is a major step forward for many teams.
- It is a comfortable decision-making method because it is based on techniques that are already widely used in teams such as the Nominal Group Technique and many forms of weighted voting.
- The procedures of ranking and weighting are simple to carry out and easy to communicate.

**Weaknesses**
- Because all the team members rank or weight their choices individually, the result is simply an addition process. Therefore, it only represents a type of “mathematical” consensus, not one based on full discussion and compromise.
- Because of the lack of discussion and full exploration of each team member’s position, everyone “votes” as they currently stand. The team members really don’t learn from each other and everyone’s present “paradigm” (world view) stays untouched and intact.
Summary

As always, there are hybrid methods that can be developed that combine the strengths of two approaches. We have experienced some very good results lately using the FACM when comparing and rating the criteria and then applying those weighted criteria using the less discussion-intense CCM. This combines the rigor of the criteria by criteria comparison with the efficiency of the rank ordering of options. Choosing this combination clearly depends on the scope and impact of the decision at hand, but at very least it focuses attention on the critical area of the identification, refinement and comparison of criteria. In many of our important decisions we would do well to even identify the criteria that are to be applied.

Conclusion

Matrices used in decision making is not a guarantee of successful decisions, but they do increase the odds that the decision will NOT be capricious or dominated by the biases of a dominant individual. The power of any matrix lies in its ability to focus discussion on a single set of relationships at a time. If we can work to raise the quality of the discussion on input for these micro-decisions, then the overall pattern of decision making can be enhanced. Gifted planners and decision makers naturally build their decisions brick by brick. Matrices are an invaluable tool for those among us who struggle every day to raise their batting average to stay in this increasingly high stakes competitive game we all play.

Example

Novacor Chemicals, Ltd., Canada. Novacor needed to choose which word processing, spreadsheet, and presentation graphics software would be used throughout the entire organization. Novacor appointed a 16-person team, composed mainly of system users and information systems staff, to a 5-day process. During that time the team members agreed upon selection criteria, heard vendor presentations, compared options, and made a choice. The result was a decision made in five working days that was sound, supported by everyone on the team, and successful. Team member, Jack W addell describes their work—A Team’s Experience—on the next two pages, reprinted from the Coach’s Guide To The Memory Jogger™ II.

Author information

Michael Brassard is Director of Product Development at GOAL/QPC. He has provided training and facilitation in Employee Involvement, Statistical Process Control (SPC), Quality Function Deployment (QFD), Hoshin Planning, and Total Quality Management (TQM) since 1979. He has worked with more than 1000 companies.

He is the creative force and editor of The Memory Jogger™: A Pocket Guide of Tools for Continuous Improvement (1985) which has sold over five million copies in eight languages. He is the co-author of The Memory Jogger II (1994) that features both the Basic Quality Tools and the Seven Management and Planning Tools. He also wrote The Memory Jogger Plus™ text (1989) and developed The Memory Jogger Plus+ Video Series (1991), and Software Package (1992) both of which support the Seven Management and Planning Tools. He has also served as Director of GOAL/QPC’s annual fall conference since 1984, which brings together individuals that practice Total Quality Management from around the world. He is a frequent speaker at conferences throughout the United States and around the world.

Notes

A Team's Experience ...

by Jack Waddell, Novacor Chemicals (Canada) Ltd.

What was the problem?
The corporation, with sites across North America, was using many different PC software packages for doing basic word processing, spreadsheets, and graphics presentations. There were three or four spreadsheet programs being used within individual sites. A team was formed with a mandate to set software standards for the corporation.

Who was on the team?
The team of 16 was selected with a majority of its members representing the user community and a minority from information systems to support a user-focus process.

How long did the process take?
Group members, who came from across the United States and Canada, were given 5 days to reach consensus on a recommendation.

What did we learn?
The team took a complex, emotional issue, with a lot of individual bias and worked through a process that left the participants feeling they had all contributed and had produced a sound recommendation backed up by numerical data.

How was the team affected?
We took a monumental amount of information and processed it to meet the needs of individual team members, the whole team, and the corporation. The team grew as a group to understand and be empathetic to the issues and needs of every team member. The process helped a group of strangers pull together to resolve a difficult problem.

What else did we use?
We took 14 headers from the Affinity we created and used these as our criteria. The criteria were ranked using the Full Analytical Criteria Method. The criteria were also sent to the software companies and they were each given 2 hours to present their product, demonstrating how it met our criteria. This information was used in ranking each software company against the criteria.

What was the conclusion?
The prioritization of the software companies against the criteria helped diffuse the emotion and bias of the decision making. The ranking of the criteria let us see what was most important in the choice of the product. The ranking against the criteria gave a distinct advantage to the spreadsheet package company. Two products in the other two categories were very close so the team decided to use the three products from one company.

What were the results?
The team reached consensus on the selection of the products we recommended to the team sponsor. This happened despite the lack of any previous use of the products by the majority of the team members. The recommendation was accepted by the corporation and implemented. The employees accepted and are happy with the decision.
Choosing a standard corporate spreadsheet program

### Option 1: Weighting criteria (described in Step 3)

This is a portion of a full matrix with 14 criteria in total.

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Best use of hardware</th>
<th>Ease of use</th>
<th>Maximum functionality</th>
<th>Best performance</th>
<th>Total (14 criteria)</th>
<th>Relative Decimal Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Best use of hardware</td>
<td>.20</td>
<td>.10</td>
<td>.10</td>
<td>.20</td>
<td>3.7</td>
<td>.01</td>
</tr>
<tr>
<td>Ease of use</td>
<td>5.0</td>
<td>35.4</td>
<td>5.0</td>
<td>5.1</td>
<td>6.0</td>
<td>.08</td>
</tr>
<tr>
<td>Maximum functionality</td>
<td>10.0</td>
<td>69.0</td>
<td>5.0</td>
<td>69.0</td>
<td>7.0</td>
<td>.17</td>
</tr>
<tr>
<td>Best performance</td>
<td>5.0</td>
<td>35.4</td>
<td>20.0</td>
<td>45.2</td>
<td>5.0</td>
<td>.11</td>
</tr>
<tr>
<td><strong>Grand Total</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td><strong>418.1</strong></td>
<td></td>
</tr>
</tbody>
</table>

### Option 2: Comparing options (described in Step 4)

These are just 2 of 14 matrices.

<table>
<thead>
<tr>
<th>Best integration</th>
<th>Program A</th>
<th>Program B</th>
<th>Program C</th>
<th>Total</th>
<th>Relative Decimal Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Program A</td>
<td></td>
<td></td>
<td></td>
<td>1.00</td>
<td>.33</td>
</tr>
<tr>
<td>Program B</td>
<td></td>
<td></td>
<td></td>
<td>1.00</td>
<td>.33</td>
</tr>
<tr>
<td>Program C</td>
<td></td>
<td></td>
<td></td>
<td>1.00</td>
<td>.33</td>
</tr>
<tr>
<td><strong>Grand Total</strong></td>
<td></td>
<td></td>
<td></td>
<td>6.00</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Lowest ongoing cost</th>
<th>Program A</th>
<th>Program B</th>
<th>Program C</th>
<th>Total</th>
<th>Relative Decimal Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Program A</td>
<td></td>
<td>.10</td>
<td>.20</td>
<td>3.00</td>
<td>.02</td>
</tr>
<tr>
<td>Program B</td>
<td>10.00</td>
<td></td>
<td>5.00</td>
<td>15.00</td>
<td>.73</td>
</tr>
<tr>
<td>Program C</td>
<td>5.00</td>
<td>.20</td>
<td></td>
<td>5.20</td>
<td>.25</td>
</tr>
<tr>
<td><strong>Grand Total</strong></td>
<td></td>
<td></td>
<td></td>
<td>20.50</td>
<td></td>
</tr>
</tbody>
</table>

### Option 3: Summarize Option Ratings Across All Criteria (described in Step 5)

This is a portion of a full matrix with 14 criteria in total.

<table>
<thead>
<tr>
<th>Criteria Options</th>
<th>Easy to use (.08)</th>
<th>Best integration (.09)</th>
<th>Lowest ongoing cost (.08)</th>
<th>Total (across 14 criteria)</th>
<th>Relative Decimal Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Program A</td>
<td>.03 (.01)</td>
<td>.33 (.03)</td>
<td>.02 (.03)</td>
<td>.16 (.08)</td>
<td>.18 (.18)</td>
</tr>
<tr>
<td>Program B</td>
<td>.48 (.04)</td>
<td>.33 (.03)</td>
<td>.73 (.06)</td>
<td>.30 (.09)</td>
<td>.33 (.33)</td>
</tr>
<tr>
<td>Program C</td>
<td>.48 (.04)</td>
<td>.33 (.03)</td>
<td>.25 (.02)</td>
<td>.44 (.08)</td>
<td>.49 (.49)</td>
</tr>
<tr>
<td><strong>Grand Total</strong></td>
<td></td>
<td></td>
<td></td>
<td>.90 (.08)</td>
<td></td>
</tr>
</tbody>
</table>

**Note:** This constructed example represents only a portion of the prioritization process and only a portion of Novacor’s spreadsheet evaluation process. Novacor Chemicals assembled a 16-person team, comprised mainly of system users and some information systems staff. The team developed and weighted 14 standard criteria and then applied them to choices in word processing, spreadsheet, and presentation graphics programs.

**Result:** Program C was chosen. Even though 14 out of the 16 team members were not currently using this program, the prioritization process changed their minds, and prevented them from biasing the final decision.
Desire To Understand An Organization’s Systemic Nature Is Gaining Momentum


As world-wide business and industrial activity grow, leaders of individual organizations and institutions find that maintaining their market share and their competitive edge becomes increasingly more difficult. The global economy forces management to operate much more deliberately and consciously in complex economic, political and social climates. This necessitates a recognition that the way things work is through dynamic, interdependent relationships. Understanding the height, breadth and depth of this, at least as far as it relates to one’s organization and its customer-supplier network, and coping with this environment, propel leaders, managers and workers into the worlds of systems and complexity.

Why work systemically? To cope with complexity

Why is systems work useful in a corporate setting? Proponents believe that it gives managers and workers a better chance to prevent being overwhelmed by situations that appear so complex that people say “I can’t do anything about that. It’s the system.” Perhaps we can invent a new word here—managing systemically can enhance copeability, organization, management and worker.

Learning needs to become part of the organization vision

A fundamental issue around an organization successfully engaging in systems work is one that could be called continuous learning. “Herein lies the dilemma,” write Peter Senge and Daniel Kim:

Organizations are in great need of new learning capabilities if they are to thrive in an increasingly complex, interdependent, and changing world. Yet managers’ attention is naturally focused on addressing their most important practical problems. Even when those problems are met successfully, there is little to guarantee that new capabilities have been developed to address similar problems more effectively in the future. We settle for fish rather than learning how to fish. This dilemma is especially vexing when the capabilities in question, like systems thinking, take years rather than weeks to master. This renders any sort of typical training and development process to develop these new skills impractical.

In systems thinking, there are a variety of tools, starting with relatively simple methods of conceptualizing dynamic feedback processes up to complex computer simulation models and management flight simulators, which can foster shared understanding of dynamically complex policy and strategy issues.
Kim and Senge relate that they have found it helpful in their efforts at Massachusetts Institute of Technology over the past ten years to "foster the practice of systems thinking as part of a larger challenge, the challenge of organizational learning." They suggest a new way of learning, using a sports or performing arts metaphor: establishing "managerial practice fields, settings where teams who have to take action together can learn together." (In The Fifth Discipline, Senge identified five disciplines of learning organizations: systems thinking, personal mastery, mental models, shared vision, and team learning.)

**System Dynamics & Systems Thinking**

As one listens to the people in the field, one tends to hear two distinct types of thought. One is System Dynamics. A central part of System Dynamics is the creation and use of mathematical models to (1) describe the system, (2) help people understand it and the interactions, and (3) test how input variations at different points in the system under consideration will affect both individual sections and the whole, and what the effects will be. By modeling the system, it is expected that costly mistakes can be avoided and better systems built. Jay Forrester states: "Unlike methodologies that focus only on an ideal future condition for a system, system dynamics should reveal the way we arrived at the present and then, in a later step, the path that leads to improvement." The other often heard term is Systems Thinking. Some talk about Systems Thinking as being within the boundaries of System Dynamics. Some suggest the opposite: System Dynamics is within Systems Thinking. The popular view "on the street" appears to be that Systems Thinking is "softer" (less emphasis on mathematical modeling), especially when the system (or organization) being looked at is rather small and not too complex.

**Operations Research and Operational Research—Soft & Hard**

Another speciality within the systems field is OR—Operations Research (U.S.) and Operational Research (U.K.). Within this, there is "hard" OR and "soft" OR. Hard OR utilizes more mathematical procedures and appears to be most often associated with System Dynamics. Forrester reports that:

Soft OR has evolved during the last few years as a reaction against the inability of classical or 'hard' operations research to deal with the major issues of interest to managers and political leaders. Practitioners of soft OR attribute ineffectiveness of hard OR to various causes. They feel that fundamental differences between physical and social systems prevent rigorous analysis, or that complexity of managerial and social systems excludes quantitative analysis, or that the human element precludes effective modeling, or that multiple criteria for desirable behavior prevent specifying objective measures of system performance.

On the contrary, I believe ineffectiveness of hard OR arose not from differences between physical and social systems, but from two aspects of the operations research practice. First, hard OR drifted into the adoption of inappropriate mathematical models—linear programming, queuing theory, regression analysis, scheduling algorithms, and Monte Carlo simulation. These mathematical procedures are all essentially static and linear in character.
and are not able to capture the dynamic nature of important processes in the real world. Second, hard OR became an academic discipline rather than a practical profession. In its academic setting, hard OR drifted toward continued refinement of the very theories that kept it from engaging the real world. There is a similar danger to system dynamics; academic research tends toward small technical challenges rather than engaging the major concerns of the larger society.

Having given up the mathematical modeling part of hard OR, soft OR concentrates on defining the situation, resolving conflicting viewpoints, and coming to a consensus about future action. As such, soft OR is fundamentally similar to the case-study method of analyzing business and social systems.

**Systems thinking is sometimes being misapplied and misrepresented**

Systems thinking in the United States, according to Forrester, “is coming to mean little more than thinking about systems, talking about systems, and acknowledging that systems are important. In other words, systems thinking implies a rather general and superficial awareness of systems. Systems thinking is in danger of becoming one more of those management fads that come and go. The term is being adopted by consultants in the organization and motivation fields who have no background in a rigorous systems discipline.” Forrester goes on to discuss systems thinking and the popular causal loops diagrams:

Much of systems thinking uses causal loops—diagrams that connect variables without distinguishing levels (integrations or stocks) from rates (flows or activity). Causal loops do not provide the discipline to thinking imposed by level and rate diagrams in system dynamics. Lacking the identification of level variables, causal loops fail to identify the system elements that produce dynamic behavior.

I do not use causal loops as the beginning point for model conceptualization. Instead, I start from identifying the system levels and later develop the flow rates that cause those levels to change. Sometimes I use causal loops for explanation after a model has been created and studied. For a brief overall presentation to people who will not be trying to understand the real sources of dynamic behavior, causal loops can be a useful vehicle for creating a general overall impression of the subject. One finds this after-the-fact use of causal loops in the very popular *The Fifth Discipline* (Senge 1990). The book presents causal loops of various management situations. The reader may erroneously get the impression that one can look at real life, draw a causal-loop diagram, and then carry through a penetrating description of dynamic behavior. Such a misleading assumption can occur if the reader fails to realize that the system archetypes and behavioral descriptions in the book are drawn not from the causal loops, but from full system dynamics simulation models that have already been extensively explored by many different people.

**Explaining systems and putting it in a context for organization managers**

You may be wondering, at this point, what is a good working definition of a system. Russell Ackoff tells us that there are three types of systems: mechanical, organismic, and social. Businesses, as well as other types of organizations, institutions and
societies, are social systems. Social systems “are open systems that (1) have purposes of their own, (2) at least some of whose essential parts have purposes of their own, and (3) are parts of larger (containing) systems that have purposes of their own.”

The performance of a system obviously depends on the performance of its parts, but an important, if not the most important, aspect of a part’s performance is how it interacts with other parts to affect the performance of the whole. Therefore, effective system management must focus on the interactions of its parts rather than on their actions taken separately.

In our culture, managers are educated to believe that a social system’s performance can be improved by improving the performance of each of its parts taken separately— that is, if each part is managed well, the whole will be. This is seldom if ever the case, because parts that appear to be well managed when viewed separately seldom fit well together. At best, managers learn how to manage the actions of parts of a social system, but effective managers manage the interactions within the part of the system for which they are responsible and the interactions of that part with other parts within or outside the organization that it affects and by which it is affected.

The predisposition to take things apart and treat the parts separately is a consequence of analytic thinking. Unfortunately, analysis and thought are frequently treated as synonyms, but analysis is only one way of thinking; synthesis is another. Few managers are aware of this alternative, let alone how to use it.

In analysis, something to be understood is first taken apart. Then an effort is made to understand the behavior of each part taken separately. Finally, understanding of the parts is aggregated in an effort to obtain understanding of the whole. Synthesis is exactly the opposite. In the first step, the thing to be understood is taken as a part of a larger whole (hence is put together with other things, not taken apart). In the next step, understanding of the larger containing system is obtained. Then the behavior or properties of the system in question is explained by revealing its role or function in the larger system that contains it.

Understanding of a system cannot be obtained by analysis. Analysis of a system reveals its structure and how it works. Its product is know-how, knowledge, not understanding. Although it cannot explain the behavior of properties of the whole, it can explain the behavior of the parts by revealing their role or function in the whole.

Managers are not confronted with separate problems but with situations that consist of complex systems of strongly interacting problems. I call such situations messes. Therefore, the behavior of a mess, and a mess is a system, depends at least as much on how its parts interact as on how they act independently of each other. Effective managers do not solve problems; they dissolve messes. Ineffective managers mismanage rather than manage messes.

**Conclusion: interest in systems is growing**

Interest in learning more about systems, sorting through the different schools of thought, becoming aware of their methodologies and tools, and understanding the process and practice is growing. Nearly 300 attended the System Dynamics Conference in Stirling, Scotland, last year, more than double the prior year’s registration.
Notes
2 Ibid., page 285.
3 Ibid., page 277.
4 Ibid., page 278.
6 Ibid., page 249, 250.
7 Ibid., page 251-252.
8 Ibid., page 252-253.
10 Ibid., page 180.
11 Ibid., page 182.
12 Ibid., page 184-185.
Typically an editor will take a single page to offer a message to the reader. In this first issue of the journal I'm inviting a little more of your time in order to present some ideas and information that I think will be useful to you. Furthermore, I'd like to know your reaction and encourage you to communicate with me about it. Your thoughts will have an influence on the journal's future content.

In the span of a single century we've experienced the Agricultural Age, the Industrial Age, the Information Age, the capitalist society and now, in some viewpoints, the post-capitalist society. In and about it all there are a host of theories, experiments, programs and ... fads.

Perhaps, however, there is at least one constant that spans it all, a constant that will endure into the next century. That constant is management, and the past fifty years has clearly demonstrated that the quality of management is the single most important factor in all aspects of human life in any economic, social or political organization or system.

In today's world virtually everything is done in and through organizations. Peter Drucker recently noted that, "Society in all developed countries has become a society of organizations in which most, if not all, social tasks are being done in and by an organization.... Yet no one in the United States- or anyplace else- talked of 'organizations' until after World War II." (Post Capitalist Society, pg. 49.) Organizations, of course, have to be led and managed. It may be surprising to many to realize that "Management as a discipline emerged only after World War II" (ibid., 43).

It would be quite obvious, if one stepped back from the trees and saw the forest, that the age we are in and will remain in for a long time to come is the Management Age. For the past fifteen years in the United States we have been merging ideas of quality into the practices of management. We will continue with such ideas in this Journal of Innovative Management--ideas of quality management, continuous improvement, excellence, systems, creativity and innovation. I will also state that this practice will involve and require a professionalization of management. In fact our individual and collective quality of life depends on the quality of management in each and every political, economic and social organization on the planet, as well as the interactions between them.

As this journal was envisioned and developed by Bob King and others at GOAL/QPC over the past year, our hearing began to filter in customer comments that would not have seemed highly significant before. Here are four different voices that merge to present a common theme:
Customer Voice #1

The first customer need was articulated by the CEO of Richard-Allan Medical, a successful and growing Michigan manufacturing company. Three years ago it was doing about $25 million in sales, had 200 employees, and was adding a 20,000 sq. ft. addition to its plant that would accommodate an anticipated quadrupling of business over the next five years. Their success came from doing an outstanding job with customer and employee focused continuous improvement leadership and Total Quality Management during the previous six years.

Rick Newhauser, Chairman of Richard-Allan Medical, made a special effort to speak to a number of leaders in Kalamazoo County. He was advocating the creation of a new, community-wide coalition, one that would facilitate the practice of Quality Management in all sectors—government, nonprofit, service, retail, education, manufacturing and health care. In his talks, Rick told people that he was doing this because his company could not be successful in the long run unless the community as a whole was successful. To be competitive he needed to be able to hire competent people, and that meant the schools had to be successful. In order for his employees to do well they needed to remain healthy, and so the health care industry had to be successful. In order for the plant to function efficiently, government, transportation, utilities, and other services had to be successful. In short, Rick Newhauser is an uncommonly perceptive systems thinker who recognized that while the marketplace for his product sales is international, the local community is a vital part of his company's supplier system. As CEO he decided that he had to pay attention to this. He also recognized that he couldn't do it all by himself, and besides, the community is really a supplier pool to other businesses, too. So Rick went out into the community and convinced his peers and other sector leaders to join with him in organizing the community for Continuous Improvement.

Customer Voice #2

The second customer comment was from Martin Merry, M.D., during a GOAL/QPC Instructors' Conference. Dr. Merry is an internist, Associate Professor of Health Management and Policy at the University of New Hampshire, and Project Director for the U. S. Department of Defense Civilian External Peer Review Program.

After I had spoken at the GOAL/QPC Instructors' Conference about efforts to expand quality management via community-wide movements, using the term, the community as a living organism, Dr. Merry said he believed that this idea of understanding and working in the larger system is vital. To cite an example, he talked about a problem of low birth-weight babies that occurs in some communities. As health care professionals look for root causes, they sometimes find that the causes do not always begin and end with the mother—they can go all the way back into the community.

Customer Voice #3

The third comment is my own, from my experience as CEO of a regional
economic development organization. When I asked the top management of the region’s largest industries what we could do to help them, I always got the same answer: “You really can’t do anything to help us with our business; what you can do that would be important to us, which we can’t do ourselves, is make the community a better place for our employees to live in.” A similar comment was made by a young orthodontist when questioned by a retailer who wondered why the doctor was a member of a downtown association: “I think we all want the same thing—a safe, clean, attractive community in which to do business.” Employees also say the same thing: they want a safe, clean, attractive place to work. Not surprisingly, customers are no different. They want a safe, clean, attractive place to buy goods and services.

In the now (as well as in the beginning) there was chaos...

There is a common thread in these three stories. It is that the community itself is an integral part of every organization’s operating systems. It weaves along these lines: from the chaos of the community (a vast resource pool) a plethora of self-organizing individual corporate entities emerge and strive for life and prosperity. Where the community facilitates the well-being of the individual entity, as well as a healthy systemic structure in the community as a whole, all are more likely to thrive. Where the community does not facilitate this duality, neither individuals, organizations, nor the community achieve their highest and best outcome, and one or more decay or die. Or, if they can afford it, some will move away from the unwholesome environment.

Customer Voice #4 ... A need to integrate systems, quality and creativity

A fourth customer voice I want to mention is a collective one. At the debriefing that followed the GOAL/QPC Research Committee meetings last spring, committee members indicated that they wanted a significant paradigm shift from simply exploring and understanding various management programs to working on how to integrate Systems, Creativity and Innovation, and Total Quality Management.

Wisdom, maturity and caring are coming into vogue

What all of this suggests to me is some potential areas of context for this journal. One is that leaders are recognizing that they have to identify and maintain a broad range of interdependencies while simultaneously maintaining competitiveness in the economy. And because of the speed of change today, adaptiveness and flexibility in identifying cooperative ventures within competitive environments are essential.

Additionally, people need to know when, where and how to compete and cooperate. People need to know when, where and how to create and dissolve relationships in an environment where today’s competitor may be tomorrow’s customer or collaborator, or vice-versa.
Organizations can ill afford to not be involved with the community, thinking it is not part of our system or it is beyond our control

The issue of an organization functioning in a community and also with other communities is a systems issue. As organizations get involved in customer-supplier dialogues they begin to get into the fringes of this arena. To consider deeper involvement, people will need to ask how they can influence and contribute to the development of the larger, amorphous, system in which their organizations succeed or fail—the community—a social-political-economic system. Every organization in the community is de facto a part of the system, however remote and minor or close and major the impact. The question then becomes: How does one do a fair share to produce a system that is wiser, more mature, and more caring?

Making a “freeze-frame” diagram of a messy environment

You may be wondering, what does our "community environment" look like? I will suggest a framework from which to view and discuss this. Using the principle of making ideas and processes visible, as well as remembering the proverb, “a picture is worth a thousand words,” I have created a Socioeconomic Development Hierarchy Matrix. It is an attempt to capture and display a plausible continuum of economic-political-social development. It is shown in Figure 1.

The lower 2/3 of the chart is what appears to me to be the current range of development among people and their business-social-political institutions. There exists a variety of complementary and competing systems, with varying levels of development and maturity. Interpreting the diagram, starting from the left, is as follows:

<table>
<thead>
<tr>
<th>Political</th>
<th>Economic</th>
<th>Organizational</th>
<th>Social</th>
<th>Intellectual</th>
<th>Emotional</th>
<th>Spiritual</th>
</tr>
</thead>
<tbody>
<tr>
<td>Democracy</td>
<td>Capitalism</td>
<td>Complex Adaptive Systems</td>
<td>A Sense of Community</td>
<td>Wisdom</td>
<td>Maturity</td>
<td>Loving</td>
</tr>
<tr>
<td>Monarchy</td>
<td>Socialism</td>
<td>Adaptive Systems</td>
<td>Collaboration</td>
<td>Interdependence</td>
<td>Understanding</td>
<td>Caring</td>
</tr>
<tr>
<td>Dictatorship</td>
<td>Communism</td>
<td>Competition</td>
<td>Independence</td>
<td>Knowledge</td>
<td>Information</td>
<td>Self-centered</td>
</tr>
</tbody>
</table>

Figure 1. Socioeconomic Development Hierarchy
• **Political Systems**: In today's era of nation-states, we have a variety of democracies, dictatorships and monarchies that coexist in the world.

• **Economic Systems**: The three systems in the world are Capitalism, Socialism and Communism with a global marketplace.

• **Organizational and Institutional**: An environment of intense competition.

• **Social**: There is a combination of dependency, and striving for independence, alongside what appear to be some entrenched bureaucracies for dependency.

• **Intellectual**: A lot of data and information whirling around with both confusion and greater understanding being achieved.

• **Emotional and Spiritual**: From a psychological or emotional perspective one might observe what looks like a fair amount of immaturity, and we can observe a lot of self-centered behavior.

That being said, one might observe that there is some growth going on—a crossing of the threshold into the upper third of the chart.

• **Emotional and Spiritual**: There is more emphasis today about caring. Business people are even talking aloud of higher ideas, such as love.

• **Intellectual**: The need to understand what is real and true and valuable is producing growth in knowledge and wisdom.

• **Social**: There is growing acceptance of interdependence. A recognition of the primacy of relationship building is increasing. Many are calling for the development of a sense of community as the foundation for a civil society.

• **Organizational and Institutional**: There is growing interest in creating methods to moderate an all-consuming pressure for short-term monetary gain.

• **Economic and Political Systems**: More and more is being published about improving (reinventing) the world’s political and economic systems. What tomorrow’s systems will be like is unknown.

**Looking at what some thoughtful people are thinking about, for example, we read in:**

• **A Nation Waiting To Be Born**— M. Scott Peck on building community, and regaining a sense of civility in our communities and organizations: “community first, decision making second.”

• **Complexity**— W. M ichael Waldrop—Understanding complex adaptive systems will give people an advantage in coping with reality.

• **Discovering Common Ground**— M arvin W eisbord and 35 international authors with a methodology that better enables strategic future planning by establishing the common ground upon which futures can be cooperatively built.

• **Kaizen**— Masaaki Imai’s 1986 book about creating a culture of personal and organizational improvement to complement innovation. (One does not have to choose tortoises or hares in the race to market; you can have both and be better off.)
• **Leadership and the New Science**—Margaret Wheatley relates Chaos Theory and Quantum Physics to organization management.

• **Learning Organizations and Learning Communities** with Peter Senge (MIT) who argues that the organizations who will truly excel in the future will be the organizations that find out how to generate commitment and an ability to learn at all levels in an organization.

• **New ideas in economics**, from people like W. Brian Arthur ("Increasing Returns"), Paul Krugman, ("Peddling Prosperity") and Robert Eisner ("The Misunderstood Economy: What counts and how to count it"), who challenge the traditional wisdom about economic growth, domestic and international trade, and employment.

• **The Post Capitalist Society**—Peter Drucker leading us toward a more productive and less contentious society.

• **The Quantum Self & The Quantum Society**—Danah Zohar and her husband, Dr. Ian Marshall, explore quantum thinking and science in terms of human consciousness and social contexts.

• **The Seven Spiritual Laws of Success**—Deepak Chopra weaves fascinating ideas about how people become successful in life that include body-mind relationships and quantum phenomena.

• **The Spirit of Community**—Amitai Etzioni pointing out the economic, political and social necessity for developing a sense of community.

• **Systems**—Russell Ackoff’s work and numerous books about the messes managers face and sometimes create, and how to work better in systems.

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**Customers**

**Because The Customer Has A Need, We Have A Job To Do**

**Because The Customer Has A Choice, We Must Be The Better Choice**

**Because The Customer Has Sensibilities, We Must Be Considerate**

**Because The Customer Has An Urgency, We Must Be Quick**

**Because The Customer Has High Expectations, We Must Excel**

**Because The Customer Is Unique, We Must Be Flexible**

**Because The Customer Has Influence, We Have The Hope Of More Customers**

**Because Of The Customer, We Exist**

Red River Army Depot, 1995 Quality Improvement Prototype Award, President’s Quality Award Program
Eastman Chemical won the 1993 Malcolm Baldrige National Quality Award. In this article Mr. Deavenport, Eastman's CEO, tells us many things about his Total Quality Management (TQM) effort. Rather than writing a summary, excerpts from his story will do a better job:

"TQM is a lot more than this week's management fad. It is a structure with direction, with purpose. TQM also demands leadership, planning, cooperation, measurement, teamwork, and creativity. The TQM process gets us from where we are today to where we want to be in the future. Quality needs to be a total company effort, a systemic effort, a company-wide culture that encompasses every activity, every decision and every person in the enterprise."

He also talks about how to build the kind of enthusiasm that empowers and includes every person in the company to be a part of the TQM journey. "When you're asking questions about the quality journey, the answers will vary depending on the person you're talking to. There is no right answer that fits every company or organization. TQM is not a subject for dabblers. It cannot be applied to its fullest potential on a project-by-project basis, even though that may be the way it gets started in your organization. It is not a bag of tricks that can be used and tossed out on an as-needed basis."

"To be really effective, Total Quality Management has to be total. In fact, it involves more than the company itself. It includes the company's total environment—the investors, the customers, the suppliers, the employees, the communities where we make our products, and the communities where our products are sold and used."

"If that sounds complicated, that's because it is. That's why a lot of companies might do a little benchmarking, a customer survey, maybe a few rounds with SPC charts; and then, a couple of years later, call it quits. They're the ones who say this TQM stuff doesn't work."

"Frankly, if I'd known how hard it would be, maybe I wouldn't have embraced TQM so quickly. Sometimes I feel just a little like Moses. When he led his people out of Egypt, did he know that they would be wandering around in the desert for 40 years? Did he know ahead of time how hard the journey would be? Then on the plus side, did he have any idea how much they would learn about themselves and their destiny during that long journey? Did he know that the lessons learned on that journey would influence people for thousands of years? We hardly ever know everything in advance when we begin any journey. That's part of the excitement."

"When we first started on the TQM journey at Eastman, we began with just a part of the Company. We started where a lot of companies start—in manufacturing. In a very short time, we began to see the power of quality. Manufacturing areas began to be more effective. And I'm not talking about incremental improvements. I'm talking about big jumps in improvement."
Partnerships To Protect The Environment

by Mario E. Ierardi, Environmental Restoration Chief and Linda Geissinger, Program Analyst,
McClellan Air Force Base, Sacramento, California

When contamination was first discovered at McClellan Air Force Base in the early 1980's, McClellan personnel faced a fearful and outraged public. Bad press was commonplace.

In 1985, the Department of Defense formed the Environmental Management Directorate (EM) for the Sacramento Air Logistics Center, the first to be formed within the Department. EM is part of the center's corporate staff, influencing decisions and setting center goals. Since then, EM has been dedicated to satisfying the needs of the public, regulatory agencies, and Air Force by maintaining a proactive and pervasive environmental program.

EM has been proactive by responding to community concerns and involving the public in environmental efforts. Key to McClellan's continuing environmental success, according to the authors, is its ability to form new partnerships, turning enemies into allies and opening doors to trust and innovation. This was not easy, however. The authors point out that management underwent "major paradigm shifts" before they accepted the public and the regulatory agencies as team members.

By forming partnerships with private industry, the public, and the regulatory agencies, McClellan's program infuses total quality environmental management into the Air Force mission. The vision to do the right thing and challenge needless bureaucracy has led to significant breakthroughs that have improved the environmental quality in the Sacramento area. Customer satisfaction with McClellan's innovative approach is evident in the feedback received from the regulatory agencies and the community. Credible, tangible results have been achieved and the base has been propelled into the national spotlight as an environmental leader.

The partnerships that McClellan has made have proven that partnerships are key to finding a better way. Teamwork builds better solutions than individual efforts. Trust can be achieved through team building, during which group members learn to capitalize on one another's strengths for the benefit of the entire group. McClellan has also discovered that it is tremendously beneficial to bring in technical ideas from different sectors, for example, private industry, as with the nonprofit group, Clean Sites.
Total Quality Management In Retail:
Structural And Cultural Transformation Of Tidyman’s Foods Grocery Chain

by Jack Heuston, Chief Executive Officer, Tidyman’s Foods
Michael Davis, Chief Financial Officer, Tidyman’s Foods, and
William T. Olson, CEO, Effective Management Systems

Tidyman’s Foods is a medium-sized chain of 10 grocery stores and a meat processing plant operating in eastern Washington state, with annual sales of about $250 million. Tidyman’s is employee-owned, with some 1,000 full-time and 500 part-time employees.

The starting point for Total Quality Management in 1992 was a situation in which store managers were extremely competitive from store to store, and department managers were extremely competitive within stores. Some of Tidyman’s greatest innovations had sprung from this competition, and yet the competition also created unevenness from store to store which was a sore point with customers.

The real challenge for Tidyman’s from the beginning has been how to achieve system-wide standardization and yet preserve and enhance the powerful entrepreneurial and creative spirit which has been the organization’s hallmark.

The organization moved quickly and deeply into TQM systems, utilizing “Quality Function Deployment” (QFD) to focus on the voice of the customer and building the “house of quality,” along with “Hoshin Planning.” They also found that “traditional accounting methods” were not doing the job and they started using Activity-Based Costing (ABC) to enable them to identify non value-added costs and work. ABC demonstrated that what appeared to be a money maker was a money loser, and more importantly, that increasing volume would simply increase losses.

Top managers at Tidyman’s believe that their achievements, in addition to those outlined above, have been considerable. Among the most important, they have changed their thinking about organizations and management. There is a greater appreciation for the corporation as a system and the rules of systems management and operation. “Grocery people typically make decisions very quickly,” they state, sometimes “shooting from the hip.” Top managers report that they still make decisions rapidly, but that they bring new considerations into play, such as design questions, information gleaned from “QFD” (Quality Function Deployment) and Hoshin Planning, and the effect of decisions on other parts of the system. Moreover, the tools of quality are often used in reaching decisions.

Managers are also pleased that they have avoided the “analysis paralysis” reported to plague other companies which have undertaken TQM. They attribute this to the fact that they have avoided a bureaucratic approach to quality and have worked hard to keep decision-making in the organization as close to the front line as possible.
Some Thoughts About Cultural Dynamics As Viewed From An Organizational Learning Perspective

a GOAL/QPC research committee report, written by
Larry R. Smith, Manager, Reliability New Methods,
Ford Motor Company—Powertrain Operations

In an effort to remain competitive in today's environment, many firms are attempting to embrace recent marketplace innovations (such as Total Quality Management, TQM), only to find that implementation is lagging because corporate culture is not ready for such a change. This paper outlines a way to provide a framework to better understand the inhibitors and enablers of cultural change in support of organizational adaptation.

The authors present graphical representations of the interplay between organization and marketplace components that are associated with organizational adaptiveness. These components include macro-representations of the fundamental elements of TQM with incremental and breakthrough modes of innovation.

Insight into the dynamics of organizational adaptation is suggested by discussing the model utilizing the "five disciplines of a learning organization." Finally, a few suggestions associated with bringing about organizational adaptation are briefly discussed.

The authors cite a 1992 Kotter and Heskitt report: a survey of more than 200 firms over an 11 year period of time found that, "Firms with cultures that emphasize customers, stockholders, and employees with leadership from managers at all levels, outperformed firms that did not have these cultural traits by a huge margin." Differences cited were in the areas of revenue increase (682% vs. 166%), work force expansion (282% vs. 36%), stock price growth (901% vs. 74%), and net income improved (756% vs. 1%). Some benefits associated with modifying a corporate culture for increased customer focus are obvious. Unfortunately, how to accomplish such a culture change is not at all obvious (which may help explain why about one-third of the Fortune 500 companies present in 1970 had vanished by 1983).

The authors point out that the model suggests that the ability of management to acknowledge and respond to changes in the marketplace environment, and to the needs of outside purchasers, is vital to long term corporate health. In addition, these two links to strategic direction are said to be powerful motivators for corporate adaptation, and may be strengthened by enhancing management's ability to work with mental models. In this regard, the research committee believes that concepts of "camp/hierarchy," first introduced by Bruce L. Gibb of Bruce Gibb and Associates in work he was doing with Ford Motor Company, and "double-loop learning," developed by Chris Argyris, are especially relevant.
Small Business in Germany, as in America, is a significant part of the economy. Zink and Hauer note that 95% of German companies employ less than 500 people and German small and medium-sized businesses account for 40% of the country's industrial revenue. With the growing use and sophistication of quality management systems in large industry worldwide, the University of Kaiserslautern researchers set out to discover to what extent quality management is being adopted in their nation's smaller organizations.

A two-part research effort was developed. In the first part a questionnaire was sent to CEO's of 3,382 companies, from 28 industries, representing all categories and sizes. They received 1,121 responses, of which 307 were not included in the formal evaluation, leaving 814 questionnaires to be evaluated. Of that total, 405 questionnaires had been fully completed and 409 were partially completed in that the respondents declined to participate fully, giving their reasons for doing so. Following the analysis of the questionnaires, 15 of the companies were selected for a more detailed case study.

One significant difference that showed up between small and large organizations is that the small enterprises believed the existence of “internal customers” was not applicable to them. Another gap between small and large business was in the area of “quality of processes.” While all respondents said that “quality of products” is a highly significant factor, small business management differed sharply from big business management in thinking about the quality of their processes. Small business thought process quality was of fairly low importance, while big business thought it was highly important.

The authors identified six special problems that small and medium-sized enterprises have in implementing quality management: lack of systems to measure and track quality (including costs of quality), lack of problem prevention systems, lack of quality planning/inspection systems, inadequate Statistical Quality Control, and problems with quality “registration,” e.g., ISO. They also listed a number of “critical success factors” under five major headings: implementing a quality strategy, customer focus and customer satisfaction, people management and people satisfaction, process management and process improvement, and focus on results.

The authors conclude by saying that they are working on solutions to the problems identified through their ongoing research program—Quality Assurance 1992-1996—sponsored by the Federal Ministry of Research and Development. The objective is to advance the transfer of knowledge between research groups and small and medium-sized enterprises; “to close the gap between talking and acting.” In the United States we have a similar term. We call it “walking the talk.”
While matrix-based decision making is not new, two variations have grown in popularity since they were introduced by GOAL/QPC in 1989. Originally published in *The Memory Jogger Plus™*, the Full Analytical Criteria Method and the Consensus Criteria Method are basically variations of the simple L-shaped matrix diagram. The matrices help people to prioritize tasks, issues, and product or service characteristics based on weighted criteria. They build on the power of focused, structured, involvement while increasing the consistency of the decision making process.

The Full Analytical Criteria Method consists of matrices that allow a team to directly compare the relative importance of criteria, the merits of all the options the group can think of, based on each criteria, and then to choose the option or options that score highly across all criteria.

The Consensus Criteria Method shares the same general features of the “full analytical” method but uses individual ratings and rankings, rather than direct comparisons, in the weighting of criteria and in the selection of the top rated option or options.

Both methods are based on the principle that a rational decision is only as good as the criteria that are used by the decision making team. Without clear consensus on the criteria to be used and their relative importance, the author points out, the process is entirely open to the conscious and unconscious biases of every member of the team.

Matrices used in decision making is not a guarantee of successful decisions but they do increase the likelihood that a decision will not be capricious or dominated by personality-type issues. The power of any matrix lies in its ability to focus attention on a single set of relationships at a time. The goal is to raise the quality of discussion on input for the decisions so that the overall pattern of decision making can be enhanced. Probably nobody bats “100” in making decisions, but matrices can be an invaluable tool for those who struggle every day to raise their batting average to stay in this increasingly high stakes competitive game we all play.