



Emergence

2011

Future of Quality Study



The Global Voice of Quality™

Introducing

Emergence



Decision Making Now and Tomorrow

James J. Rooney
ASQ Chair

Risk assessment and risk management are daily activities for decision makers. Often, decisions regarding risks must be made under uncertain conditions and without the best possible information. This uncertainty of the future is one of the main marks of the human condition. It taints all manifestations of life and action.

The ASQ Future of Quality Study provides intelligent decision makers with good information based on a multitude of factors and the interests of numerous communities. The use of this study as an input to risk-based decision making will help people make better, more logical choices. A good decision made quickly is much better than a perfect decision made too late. On average, and over time, good decisions made using the Future of Quality Study should provide the best outcomes.

The Future of Quality Study structures and presents the 2011 forces of change to better facilitate decisions and focus actions. It provides critical input to the decision-making process by clarifying tradeoffs, consequences, uncertainties, benefits, and risks so that decision makers can make more informed choices. Decision makers can identify high-risk areas and develop risk management approaches to reduce the risks associated with the future state of their enterprises and communities.



“Information is
the currency of
democracy.”

— Thomas Jefferson

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ASQ

is a global community of people passionate about quality. Members of the community gain access to unparalleled resources and a knowledge network that links the best ideas, tools, and experts to make our world work better.

Welcome

to Emergence



Emergence and the Future

Paul Borowski

ASQ CEO

When the ASQ project team met to discuss a theme for the 2011 Future of Quality Study, EMERGENCE got the nod. It's a fine term, but what exactly does emergence mean? It was a question all of us in the room had. Where to look first? I went to my long-valued, tattered, and worn *American Heritage Dictionary* (quote to the right). Since my dictionary is 35 years old I felt I should consult a recent resource to see if the definition has changed. Did I search for a printed dictionary with a 21st century copyright? Of course not. I went to the Internet (which, if it were a word in 1976, would have been found between Internet and internist). The first link was to Wikipedia and there, along with a definition, (to the right) was a small ebook on the topic, along with links that would have engaged me for the afternoon.

I doubt executives at Houghton Mifflin Company (publishers of the *American Heritage Dictionary*) imagined that the ARPANET (1969) would become the Internet (1971) and that the personal computer (1974) would put the World Wide Web (1980) at our fingertips. I doubt Wikipedia (2000) founder Jimmy Wales dreamt about it as a child. Nor did little Jimmy imagine tweeting (2006), although Jack Dorsey may have taken a queue from "texting" (1992, Neil Papworth), which was limited to 160 characters.

The point is our world is changing. The way it changes is becoming increasingly less predictable. In the mix of this unpredictable change we make our way through life. We work for organizations whose survival rests on someone's ability to traverse this sea of change—desperately trying to keep expenses less than revenue.

No matter how unpredictable the future may be there is still advantage to those who get a jump start on the rest of us. There is a premium of anticipating the future and getting there first. Often the premium is remarkable. But how do we anticipate the future if it's increasingly unpredictable? One way is through futuring and scenario development. If you have an urge to consult your dictionary for a definition of futuring, there's no need to—it's not there yet.

Futuring

In simple terms futuring is about enhancing your ability to anticipate the future in a way that's both focused and expansive. Yes, both. It's focused in that the first step in futuring is identifying the forces most significantly affecting the future of any topic of interest. The second step is to challenge yourself to expand your consideration of the future under various scenarios. Good news scenarios. Bad news scenarios. Business as usual scenarios. I refer to this step as "increasing your bandwidth" on what the future may hold. The third step in futuring involves postulating the implications of the



"Emergence:

The unpredicted appearance of new characteristics or phenomena in the course of social evolution."

—American Heritage Dictionary, 1976

"In philosophy, systems theory, science, and art, **emergence** is the way complex systems and patterns arise out of a multiplicity of relatively simple interactions. Emergence is central to the theories of integrative levels and of complex systems."

—Wikipedia 12:30 p.m. (CDT) September 21, 2011

various scenarios on your future. In other words, what would you do in response to a given scenario? Anything you would do is something you can build as a core strength. Responses that vary by scenario lay in waiting until that scenario begins to present itself. But at that point you have already pre-thought your response and can lead, change, and act (step 4 in the process) with confidence and ability.

Four Steps to Futuring

- Step 1: Identify the forces of change.
- Step 2: Develop scenarios of possible futures.
- Step 3: Explore the implications.
- Step 4: Lead. Change. Act.

ASQ's History of Futuring

ASQ began this process of futuring in 1995 when ASQ Past Chair, David Luther, a senior executive at Corning, (see p. 41 for his insight) introduced the concepts along with a book, *The Art of the Longview*, by Peter Schwartz (Currency Doubleday, 1991).

ASQ conducted its first Future of Quality Study in 1996 and has repeated the study every three years. True to theory, change is accelerating and in unpredictable ways. But within the bandwidth of the scenarios that were developed came valuable implications. Implications to quality itself—what quality is and what it means. Implications to the practice of quality in organizations and communities. Implications to the professionals mastering the concepts, techniques, and tools to lead quality initiatives—and create the next generation of practices. Finally, implications to ASQ in our continued desire to become ever more relevant to our members and the quality community.

Predictive Validity?

In the section “Looking to the Future From the Rearview Mirror,” the 2011 panel of experts describes the recent history of quality. It’s clear that quality has been dynamic in response to the forces of change. Quality is not today what it was in 1996, or even 2008 for that matter. Those who lead the practice of quality are leading change and finding themselves moving up the strategic ladder and making a huge difference in their organizations. Others are struggling to understand why their trusted tools don’t work as well as they once did.

Take any one of the trends identified and apply them retrospectively to the past as strategies to the present, and I

think you’ll find the response of leaders was aligned with the forces, scenarios, and recommendations in the implications. I’ve been around long enough to know that correlation does not prove causation. However, that doesn’t stop me from taking some comfort in the validity of the study to anticipate the changes the community would indeed embark on in response to the forces of change.

Trends in the Practice of Quality

- A larger role for quality in strategy
- Enterprise quality
- Expanding complexity and scope
- From product/service-centric quality to experience-centric quality
- Quality culture
- Waste reduction
- Quality in every field of endeavor
- New roles for the quality leader

Using the Study

Many studies are about answers. This study is not. It is about focus, exploration, and broadening your consideration of the future. The 2011 Future of Quality Study is about provoking questions about what you want to do in anticipation of the future. Answering those questions makes you agile. Getting to a state of agility requires good thinking and, more importantly, good dialogue.

Over the next three years ASQ will host dozens of “stakeholder dialogues” where we will invite members and others to join us in conversations about the future of quality. The forces, the scenarios, and the implications from this study are seeds for the conversation but do not create limits. We will host these conversations all over the world and from each conversation we will capture the wisdom of the participants. Conversation by conversation we will see patterns begin to emerge that give us insights into the most pressing issues that need to be addressed. From those patterns and themes, ASQ’s board will consider its strategic response. But that’s just ASQ’s use of the study.

Organizations will also find this study of use. ASQ encourages and will support organizations that want to use the study to explore the implications for themselves. ASQ will host a conversation in exchange for the benefit of understanding the implications from the organization’s distinct point of view. Company by company, school by school, community by

community, hospital by hospital, we gain insights, share thoughts, and set change in motion.

And we never conclude a conversation about the future of quality without pointing out the third critically important customer of the study—you. Anyone wondering about future career skills needed and opportunities arising will find direction in this study and find wisdom in the conversation.

Raise the Voice of Quality

The quality community has a big job to do. Too often I run into executives who learned what they know about quality a decade or more ago. They often hold product-centered notions of quality. This is out-of-date thinking.

The quality community must raise its voice and say, “Through quality all of our goals can be realized.”

Quality is not an accident and comes from more than good intention. Quality can’t be taken for granted. When the importance of quality is reduced in any way, processes fail to work, mistakes are made, and we will all pay for that day of reckoning.

Contributors

The Panel

More than 140 people from 33 countries started out on this study together. You’ll see their names and affiliations on pages 10-11.

Noted Experts

Greg Watson has been writing the Future of Quality Study scenarios since 1999. Greg is unique in his ability to do so. Not only does he understand the purpose of the scenarios, but he also devotes an incredible amount of time to supporting research. In addition to the scenarios contained here, Greg wrote a larger research piece, “Prognostications: Scenarios of the Future as Viewed in 2011.” The report was published by the International Academy for Quality. Greg serves as IAQ’s chair. I recommend the whole research report to you. Greg is a past chair of ASQ. View Greg’s report at asq.org/2011/09/global-quality/prognostications-scenarios-of-the-future-as-viewed-in-2011.pdf.

Deb Hopen is the editor of *The Journal for Quality and Participation* and has many gifts including her ability to see the bigger picture. I invited her to review the forces of all six of the studies to determine if there were larger trends at work. You may also enjoy the fall issue of *JQP* which features the Future of Quality Study. Deb is also a past chair of ASQ.

Harry Hertz directs the Baldrige Performance Excellence Program for the U.S. Department of Commerce at NIST. Harry joined the Baldrige program in 1992 and has directed it since 1996. Harry is a keen observer of enterprise management practices and has interesting insights to share about how the forces of change will impact enterprise management.

David Luther initiated the first Future of Quality Study in 1995 when he was ASQ’s chair. He has been a member of the panel for each of the studies and an astute commentator on the future. Dave’s career has included 32 years at Corning Incorporated, where he served in many capacities, including senior vice president and corporate director of quality.

The Research Team

Beth Christensen and **John Van Slyke** joined me in the work of conducting the research. Beth runs the study and the supporting technology. I entered in to help make sense of the panel contributions and directed the line of questioning. John joined in the sense-making stage of the study, pouring through the implications stage and the pages and pages of contributions offered. He also helped make sense of my prose, which can be challenging.

Future of Quality Study Methodology

Identifying the forces shaping the future of quality necessitates the contributions of thought leaders, executives, and global representation. ASQ began the process in January 2011, by electronically inviting more than 270 individuals from all major sectors of the global economy, ASQ WorldPartners, International Academy for Quality members, past ASQ medal winners, ASQ Enterprise members, and recommendations from the quality community. Invitations were extended through the duration of the study.

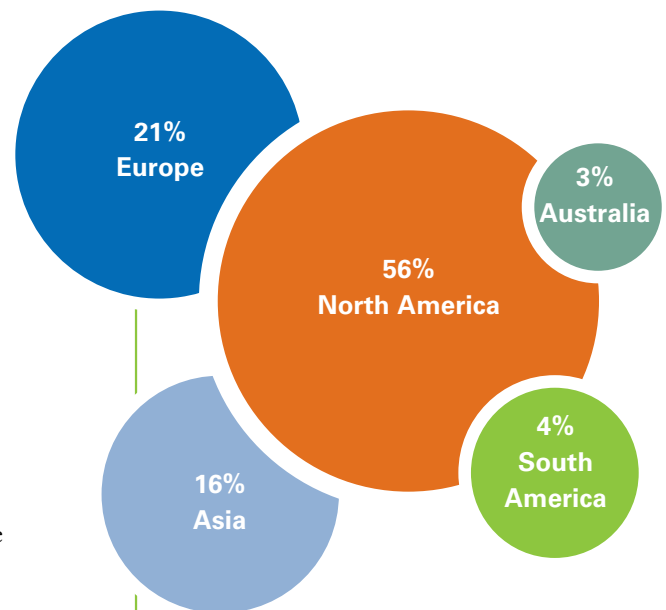
Using the definition of a “force” as, “a powerful change or trend in a social, political, technological, or behavioral area that will impact people’s lives,” ASQ prepared for the study by scanning a number of available reference sources and past studies for trends. Of those selected, 43 were used to seed the study. ASQ employed the Delphi technique, a systematic, interactive method that relies on a panel of experts. The collective wisdom of the group converges toward a consensus on forces that are shaping the future of quality. James Surowiecki’s book, *The Wisdom of Crowds*, lends credence to this approach (Doubleday 2004).

Panelists were asked to electronically log in and select 10 forces that he/she felt were most likely to shape quality in powerful and forceful ways. For all intents and purposes, “quality” was not defined and “the future” was projected 15 years ahead of the current time. Panelists were also asked to state why a particular force was chosen and were given the opportunity to combine forces, suggest new forces, and note patterns.

Panelists repeated this electronic process in three successive rounds through the month of March. After each round, the list of forces was updated and participants were provided with a document containing the anonymous explanations of why forces were chosen. This was to inform them of the thinking of other panelists for the next round.

In the final round, panelists were asked to select up to 10 forces and rank order them. While unconventional, panelists were asked to use 10 to indicate the most significant force, 9 the second most significant, and so on. This aided in the analysis of the relative strength of the ranked forces. Again, panelists were asked to explain their reasoning for their selections. As a result of the rank order process, ASQ determined the 2011 list of eight forces affecting the future of quality.

More than 140 individuals participated, representing 33 countries. A breakdown of panelist demographics is as follows:



The panelists were 81% male and 19% female.

Global economy—
Service: 37%
Nonprofit: 21%
Manufacturing: 19%
Education: 17%
Healthcare: 5%
Government: 1%

2011 Future of

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Niyazi Akdas	Allan Ebedes, National Quality Institute
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2011

Future of Quality Study



2011 Forces of Change— Shaping the Future of Quality

What follows are the top eight forces that the panel determined are shaping the future of quality. The narratives paraphrase the perspectives of the panel relating to each force. If you're interested in how the forces of change have evolved over time, see page 32.

1. Global responsibility represents the blending of heightened awareness of the requirement to become more socially responsible with a growing awareness of the global impact of local decisions. Our planet's finite resources are being called upon by a growing percentage of people in the world, and waste that was once economically acceptable is becoming socially unconscionable. The breadth of global responsibility spans governance, human rights, labor practices, fair operating practices, environment, consumer interests, and contribution to society as described by ISO 26000. Global responsibility is a call to ethical leadership at all levels of society—governments, companies, schools, civic organizations, neighborhoods, families, and individuals with an evolving understanding of what being responsible means.

At an organization level, global responsibility embraces growth and profit—it is not philanthropy. Global responsibility appreciates the dual dynamic of being responsible by reducing waste (in all forms*) and the realization of that savings to the bottom line with increased expectations that Web-informed consumers will reward organizations for their responsible efforts with their purchases. Leaders will advocate concurrent improvements in top and bottom lines. Organizations increasingly value their reputations and act to sustain them in the face of crisis. For producers, global responsibility is a complex topic that goes well beyond production efficiency and production waste. It includes responsible design and the obligation for full product life cycle stewardship. Innovation becomes an advocate of sustainability. An innovation without a decreased cost to society will be viewed as irresponsible.

There are increasing expectations that today's global organizations will contribute their problem-solving skills and resources to societal needs out of enlightened self-interest for the longer horizons of business sustainability through a combination of social and organizational strength.

(*Waste—most definitions of waste are limited to the observable aspects of waste—scrap and pollution. Some might include rework (the hidden factory) as a cost of waste. Fully understood, waste includes the cost of addressing dissatisfaction and both the disloyalty of customers and the lost opportunity that dissatisfied word-of-mouth may cost in the reduction of new customers. Future measures of waste may well include the waste of poor use of material in design, the waste of human potential, and the full cost of unethical conduct on the lives of those affected. All these costs and consequences are avoidable and therefore may be considered waste. Another waste is the waste of humanity that comes from undeveloped minds; lives lived without purpose and the lost contributions to society that would come with the full engagement of all people living worthwhile lives.)

At an organization level, global responsibility embraces growth and profit—it is not philanthropy.

2. Consumer awareness is about consumers using their knowledge to make purchasing decisions best aligned with their preferences. Before the Internet, consumption was primarily limited to locally available products and services. Today consumers can “shop” around the world, and they can use Internet knowledge to inform their decisions not simply related to the product/service itself, but also the practices of the company. If the Internet made knowledge *widely* available, social media is making information *instantly* available. Consumer behavior moves at “speed of the electron” pace in both positive and precipitously negative directions. Providers will find themselves needing to respond at similar rates to the collective behavior of customers.

Closely related to the rise of consumer awareness is the ability for consumers to match their requirements and product/service attributes. The organizations that create the greatest flexibility in their ability to create products and services to match customers’ exact wants and needs will be rewarded. Service providers are already headed this direction as they tailor experiences to custom fit their customers. Their databases and the massive databases available to them allow them to capture customer preferences. New flexible manufacturing technologies will soon allow manufacturers to follow similar paths of mass customization. Economical order quantities of one and zero wait times will become the rule.

This force will usher in a new meaning for the customer-focused organization.

3. Globalization is the only force that has been on the study since 1996. It was no. 1 in 2005 and 2008. Earlier studies referred to globalization as the “800-pound gorilla” of forces. Its strength was twice that of the force that followed it on the list. However, what globalization means has shifted since 1996 when globalization meant a huge opportunity for companies that could figure out how to capitalize huge new consumer markets. By 2005, the opportunity of global markets was offset by fear of competition and lower cost labor. What seemed certain by 2008 was that globalization was an irreversible reality whether opportunity or threat. Those who ignored globalization did so at great risk.

Then, as now, the only neutralizing factor, but not strongly measured, was the prospect of local production and a sense of social responsibility to earn a greater share of consumer spending. Why buy produce shipped halfway around the world, even if less expensive, when locally grown alternatives could significantly reduce packaging, transportation, and energy consumption? “Read the packaging” has new meaning in 2011.

Global customers and supply chains occupy a greater share in organizational strategy. Risk and opportunity are huge and executives and governments are reeling in response to issues that are no longer bound by national borders. Complexity has new meaning—or, better said, human minds struggle to make meaning of the complexity they face. If that’s not enough, complexity is certain to increase.

Woven into the opportunity and risk of globalization and the challenges of organizations to manage their enterprises that now cross borders, cultures, and economic developmental stages, are the issues of finite resources.

4. The increasing rate of change was bound to surface as a force of change. In the background of past studies has been the issue of speed. In fact in 1999, when we reviewed the 1996 study’s findings, a common comment was, “the only thing we underestimated was the rate of change.” That factor became known as speed—and in the 21st century technology is the gas pedal.

Like earlier forces, the increasing rate of technological change brings opportunity and threat. High amongst the threats is society’s inability to adapt to the changes foisted upon us by new technology. New technology could create consequences if we fail to look ahead.

On the opportunity side of technology are solutions to world problems. Energy, pollution, fresh water, food, housing, HIV, and cancer all lay on our list of hopes for technological solutions. Without solutions to these problems, our dream that the future can provide our children a quality of life equal or greater than our own is doubtful. If population growth was the driver of economic success in the last century, it will have to slide over as technology takes the wheel in the 21st century. However, technology will be much less predictable a force than population growth. Technology is certain to surprise us in ways that disrupt our status quo.

Futurists are already predicting that nanotechnology will have a more significant impact on our lives than the Internet, and other technologies that we haven’t even labeled will be right behind nano. And don’t count information technology out either. In 2005 a terabyte of storage was nearing \$100 (USD) and was the size of a small handbag. Now two terabytes can be purchased for the same price and the size is not much bigger than a pack of cigarettes!

Product life cycles are short now. Consumer electronics have life cycles of six months or less and will be shorter in the future. Industries will be born, become significant in our lives, and disappear with increasing rapidity. Being first to market will be where the riches will be won. There will be little time, or even market, for second place.

All this speed will require organizations to better anticipate the future and be prepared to respond to the customer’s feedback immediately. The cost of missing a cue from the market, at today’s speed of information sharing, could be disastrous to producers.

5. The workforce of the future will challenge our notions of talent, work, workplace, and learning. While hard to fathom, we're being told unemployment, as we think of it, will become a thing of the past. The number of jobs will soon exceed the number of people available to fill them. Demographers predict organizations will find themselves competing for talent and that competition will move jobs around the globe. High-tech companies already report this reality. This search for talent, along with technological advances, will change the nature and place where work is done, and organizations will grow increasingly flexible in their definitions of work engagements. Those of retirement age will be re-attracted to work with flexible hour arrangements and work that can be done without commuting.

The rapid expansion of information (now doubling every 18 months) and the impact of accelerating technology change will put pressures on organizations to keep their workforces current. Lifelong learning will take on new meaning and the methods of learning will change in response to just-in-time education needs. Organizations will find the need to provide greater considerations of time for learning and larger investments in keeping their workforces current. Counter to the doubling of new information is our ability to forget the wisdom of the past. A real challenge in educating the workforce of tomorrow is to preserve the wisdom of the past and to build upon it based upon new insights rather than to continue to discard knowledge and theory in favor of the latest, most-fashionable concepts.

Traditional providers of education (schools and universities) will find a need to place a premium on preparing students to learn. The emphasis may shift from what students learn to how students learn. Professional certifications, evolving toward competency based models, will grow in volume and importance as organizations shift their expectations from knowledge and experience toward demonstrated competencies.

6. Aging population provides challenge and opportunity. Increasing life expectancies will challenge world resources and place increasing pressures on the cost of providing healthcare to a larger percentage of the world's population. Adding years to life comes at a premium of healthcare costs, and society has not addressed the ethical and moral ground of our "at all costs extend life" beliefs. Likewise, our models of social welfare for the aged are based on assumptions of the many (working) paying for the few (not working.) Declining world populations and expanding aged populations are already testing the durability of these models around the world. It seems working longer will be a certain option, if not requirement, to postpone a day of reckoning. Organizations will need talent, and people will need the economic means to shore up their finances. Retirement may quickly become a short-lived artifact of the latter half of the 20th century.

There will also be opportunity in the growing aged market. Never before has the world faced the numbers of aged citizens and little is known about the consumption and lifestyle needs of this segment.

Demographers predict that by 2025 the majority of the population will be 65-plus. With housing, furnishings, and the cost of raising and educating children behind them, we can anticipate whole new lifestyle options and experiences being created for a vital and growing segment of the population when other segments might well be in decline.

Quality of life may resurface with significant importance when the answer is not driven by the formula of "more" and the engine of growth—rising populations—is no more. Stable or declining world populations could have a dramatic impact on global economies.

7. 21st century quality may appear obvious in this section—like going to a dictionary to look up the future of quality and finding "see quality." However, this is fitting because quality is not what it was in the past. Organizations should prepare to benefit from what quality is becoming or they will be subject to the competition of those that do. The practice of quality has traveled a long evolutionary path, from quality through pride, to quality by inspection, to quality assurance, quality by prevention, perfect quality, and perhaps quality of creation. We have also seen quality depart from an aspect of product, or service, to the quality of management, and ultimately the quality of the enterprise itself. From products, to processes, to systems, to enterprises. Through all this evolution one truth has not changed. Quality is ultimately what the customer says it is, and for what the customer is willing to pay. This truth is shaping organizations, industries, and countries. It is an immutable truth, increasingly so in an information rich environment.

Dr. Joseph Juran (1904-2008) gave the quality community a compelling prophecy. He said the 21st century would be the century of quality. What was it that he foresaw? Did he foresee the expansion of quality into every sector of the economy—manufacturing, services, education, healthcare, government, and nonprofit? Did he foresee the expansion of quality globally? Did he see a large scale realization of the importance of quality by leaders of all organizations? Or did he see all of these possibilities at once?

If quality in the last century was defined by control and improvement, it is clear—that while necessary—control and improvement will not be sufficient for the 21st century. Change and transformation are the emerging tools of quality. There is debate over whether the same professionals can span a skill continuum from control to transformation, but leading thinkers in the field are investing their time in minting new tools for change and transformation and investing their energy to obtain new skills.

Many predict that near perfect product/service quality will be a minimum for being competitive in the future. Table stakes. The best companies are moving beyond product quality to manage their total customer experiences. Best practice companies around the world are showing, by their examples, the efficacy of quality applied to the improvement of the whole organization. (These are the national quality award organizations in nearly 100 countries—manufacturers,

service companies, small businesses, universities, schools, healthcare providers, nonprofits, and governments.)

What is clear is that quality still provides a sustainable competitive advantage, wherever it's applied. It is also clear that modern quality practices are still less common than you might hope. There is a huge opportunity for quality to be a force of change in the future of quality. And whatever quality is today, it would surely evolve in response to the constellation of forces it joins in shaping the future.

There's one additional evolution of quality that is evident and powerful. If quality started in the hands of skilled trades and artisans, it moved into factories when mass production became the norm. Then it moved out of factories into every imaginable kind of organization—small and large. Today quality is being called out of the organization into the space between organizations through global supply chains and through networks of companies that understand their greatest challenges lay outside their organizational walls. And from there, quality moves even further up the feeding chain to be used as concepts, techniques, and tools in the solution of social problems. While the number of examples is small, they are nonetheless evidence that quality is exerting itself in new ways—in hopeful ways.

8. Innovation has become a buzzword. It seems to mean the pursuit of something different and exciting. How innovation differs from R&D is uncertain. How innovation differs from improvement is unclear. What is clear is that innovation is increasingly the lifeblood of an organization. With today's accelerating pace of change no organization can assume its future without the ability to bring innovation to customers. How to stimulate an organization to innovate is the subject of papers, conferences, articles, and the elixir of consultants. An entire industry has developed and grown in response to the opportunity to help other organizations innovate. How to create cultures that innovate is a challenge for today's leaders. Countries strive to enhance their capacity to innovate. National policy, tax treatments, innovation zones, and direct investment all aimed at supporting and encouraging innovation are in place around the world. And a great deal has been written about educational systems and their ability to develop within people the mindset and skills to innovate. Companies include innovation in their strategies, annual reports, marketing literature, and in their assessments of their leaders. It is as if innovation was a discovery of the later years of the last century, and perhaps it was. Innovation it seems is poised to replace manufacturing as the source of wealth creation in countries.

If innovation means the ability of a company to anticipate customer needs, expressed or unexpressed, known or unknown, and bring products/services to the marketplace that excite customers, then clearly innovation is the fuel of growth in today's changing world, and more so tomorrow.

Scenarios of the Future as Viewed in 2011

Gregory H. Watson

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The scenarios chosen for the ASQ Future of Quality Study are designed to challenge our thinking by providing a broad spectrum of possibilities that reflect the perspective of the identified key forces for change. The scenarios represent a series of four potential circumstances that could evolve from our knowledge of the current state. These scenarios do not in any way represent a forecast of any future that will occur or even which might be desirable. Scenarios are used in futures studies as a means to think differently than we do in our routine, daily life. They encourage us to consider what would happen if our world migrated from the current state to this possible future state. What are the potential hallmarks of change along the various journeys represented by the scenarios? Learning helps to open our minds to new possibilities and opportunities that can shape the future in different ways (Schwartz, 1991).

The question that must be addressed is not whether these circumstances will occur but how their occurrence will affect the world and how mankind will respond to them. The key characteristics of the four scenarios include the following attributes:

- **Scenario 1: Global Awakening—The Utopian Scenario**

Population: Population stabilization in the range of 6 to 8 billion people

Environmental: Offsetting climate in conjunction with a long solar minimum

Political: Enlightenment and coordinated global action

- **Scenario 2: Resource Restoration—The Preferred Scenario**

Population: Population at the replacement rate of 8 to 10 billion people

Environmental: Offsetting climate in conjunction with a moderate solar minimum

Political: Collaboration among developed and developing nations

- **Scenario 3: Death by 1,000 Cuts—The Status Quo Scenario**

Population: Population growth to more than 10 billion people

Environmental: Offsetting climate in conjunction with a short solar minimum

Political: Minimal collaboration and rigidity in political positions delaying corrective action

- **Scenario 4: Past the Tipping Point—The Domsday Scenario**

Population: Population growth to 10 billion followed by rapid declines to less than six billion

Environmental: No solar salvation, generating a global collapse of the ecosystem

Political: Contentious political rivalries have blocked agreement on a path forward, so no decisions have been made; chaos and anarchy prevail



The scenarios are excerpts from “Prognostications: Scenarios of the Future as Viewed in 2011” published by the International Academy for Quality.

The full report is available at asq.org/2011/09/global-quality/prognostications-scenarios-of-the-future-as-viewed-in-2011.pdf.



Scenario 1: Global Awakening

The people and nations of the world have awakened and now understand and anticipate the complex, multi-dimensional, systemic nature of the growing global crisis. They have taken positive, enlightened technical and political action, coordinated through the United Nations, to assure equitable management of a sustainable world.

Long-term technical solutions include the following:

- *Resolution of issues related to nuclear power.* Generation of clean, more efficient nuclear energy through fourth generation, fast-neutron reactors; storage, recycling, and disposal of nuclear waste; and increased electrical-system power efficiency; and improved transmission-loss management through universal smart-grid technology.
- *Biotechnology.* Ability to understand and safely manage genetic modifications to improve crop yield and resistance to drought and pests.
- *Nanotechnology.* Delivering medical solutions to target specific diseases and promote cardio-respiratory health.

Solution of these ecological and energy-management issues became possible during a 40-year period of solar pacification. A solar minimum offset the exponential heating effect that was created by the anthropogenic climate change. The solar minimum allowed mankind a reprieve from climate deterioration. This wake-up call caused the people of the world to join forces and take seriously the cumulative impact of local pollution on the global environment.

The precedent of having the UN coordinate and balance actions had been instrumental in reversing the ozone depletion crisis of the late 20th century. Now this approach has been adopted to define requirements for economic development, helping to assure improved quality of life while managing the global environment in a way that maintains the human race at a sustainable global population of 8 billion people. The appropriate use of technology has been employed to eliminate the risk of potentially destructive environmental failure modes. Statistical analyses have determined the actions that are most likely to reverse the effects of environmental pollution on the ecological systems of the world. Global resource balancing has led to the “have” nations underwriting the “have-not” nations, preventing actions that would undermine the ecological balance. Quality methods and techniques have been built into local economies, generating win-win management of the global economic marketplace. The UN Global Economic Council focuses on the well-being of the world community rather than on individual nations seeking their own advantages. Technology is leveraged to solve the problems that most affect mankind as a whole, rather than merely for economic return—especially for medicines and living infrastructure systems.

Table 1 indicates how the key forces identified during the ASQ 2011 Future of Quality study influence this scenario.

TABLE 1

Influences of Key Forces on Scenario 1: Global Awakening

Key Force	Nature of Its Influence on This Scenario
Global Responsibility	<ul style="list-style-type: none"> • Nations align by regional divisions of nature (e.g., by dominant watershed rather than by geo-political or cultural boundaries). • Focus on collaboration assures all people enjoy an equal opportunity to access the Earth’s bounty. • New economic currency measured in terms of clean water, pure air, adequate foodstuffs, and sufficient energy, rather than monetary values that do not reflect basic human needs.
Consumer Awareness	<ul style="list-style-type: none"> • Recognition that rampant consumption of resources is detrimental to a sustainable world. • Wasteful transformation of resources into useful products is not tolerated. • Definition of quality in terms of luxury replaced with pragmatic utility in both the production and life cycle application, assuring minimal total cost to society. • Consumer decisions driven by a new wave of austerity. • Consumerism no longer is a motivation for economic growth.

Globalization	<ul style="list-style-type: none"> • New global playing field generated by shift from monetary policy (exchange of money) to social policy (exchange of value). • Associated new indicators integrated with fundamental human rights—the right to exist, socialize, and obtain personal development—across all nations and organizations. • Emphasis moves to the similarities among nations and races, instead of the distinctions. • Collaboration and focus on mutual benefits enhanced by increased capability to communicate across cultures. • Greater rapport exists in the face of diversity rather than animosity and divisions that alienate people.
Increasing Rate of Change	<ul style="list-style-type: none"> • New perspective on change—it can be harnessed and is not always required. • Excessively rapid or frequent change understood to be wasteful. • Competition as a driver of change replaced by cooperation. • Social democracy replaces the capitalist motivation for all mankind to join the ranks of the bourgeoisie. • Technology managed across all companies. • Technology transitions minimize waste and loss to society.
Workforce of the Future	<ul style="list-style-type: none"> • Work redefined as “any motion that produces value and benefits society” due to renovation of the world value system. • Work considered to be a developmental process rather than a series of completed actions. • Continuity in strategic direction and alignment of purpose increase in value because they eliminate waste and take advantage of past wisdom and lessons learned. • Future performance effectiveness and efficiency leverages these new circumstances.
Aging Population	<ul style="list-style-type: none"> • Aging population becomes a resource of wisdom for society. • Older citizens remain active to maintain exceptional healthcare and forgo the “social benefit” of retirement. • Elder generations bear the responsibility for the effects harvested in prior years and help to facilitate required social transformation to make the world a better place.
21st Century Quality	<ul style="list-style-type: none"> • Quality has become the pervasive value of the new society, reflecting both the objective of the social system (democratic quality of life) and a motivator for minimizing the waste of resource losses to society (known as the “Taguchi effect” in honor of the Japanese engineer whose concept of value-based management created an economic foundation for the new non-monetary value system that has been introduced as a quality of life initiative by the United Nations). • The philosophy, methods, and tools of quality have been incorporated into all engineering, business, and social science academic disciplines and are taught in the common core curriculum. • All professional societies/associations sponsor groups that focus on the adaptation of quality into their disciplines and bodies of knowledge. • Quality is truly ubiquitous, being an essential factor in all professions and organization types. • Quality provides the direction for rational decision making in an uncertain world, contributing to the discussions of all questions raised in society.
Innovation	<ul style="list-style-type: none"> • Inclusive innovation has evolved to become the hallmark of transition to future generations of mankind. • Growing social awareness has increased mankind’s appreciation of the benefits of human diversity for developing and applying potential new technologies that eliminate the squandering of resources and create lasting value. • The general concept of innovation has separated into macro-innovation (focusing on the global environment and the inter-system operability) and micro-innovation (focusing on new technologies, products, and services). • Macro-innovation minimizes total waste across all global resources. • Micro-innovation solutions require evaluation cycles to assure waste is avoided and developments generate global sustainability. • Innovation has moved from an art to a science that contributes to the policy decisions that govern global activities.

Scenario 2: Resource Restoration

Nature has granted mankind a reprieve in the form of solar pacification, which lowered the average earth temperature 7°C. Although global warming effects that have occurred over the past 40 years continue to build, they have been masked by the decrease in solar radiation caused by the reduction in sunspot activity. These cooler temperatures have rolled back some of the negative consequences of climate change by relieving the symptoms of anthropogenic global warming. They do not address the root causes, however, and merely are delaying the long-term impact of global warming.

The following factors have significant influence on the quality of life for all people:

- The mini-Ice Age has benefitted mankind by stimulating world leaders to face the reality of our fragile environment. A more conscientious approach for attaining a systemic solution of the driving causes has been adopted.
- The growing population has been recognized as a key factor in climate change, so global leaders have agreed to use a combination of tax policy and contraception to limit increases to 8 to 10 billion inhabitants.

- Additional work is under way to improve infrastructure and support this population with pure water and adequate food.
- The need to provide meaningful and honorable work while sustaining the global ecosystem now is emphasized in decision making.
- Universal education is encouraged, building global literacy and increasing participation in local and national politics.
- Organizations have begun to realize their dependence on a steady supply of affordable energy, clean air, and pure water.
- Technological developments can extend the projected life of known resource reserves by creating more efficient applications. For instance, the nuclear power industry has increased its previous 60-year estimate for uranium reserves to more than 3,000 years, based solely on technological advancements.
- The world is coordinating and dedicating its shared resources so that the deficiencies from past generations are being corrected and the survival of mankind on the planet is assured.

The influences of the futures study’s key forces appear in Table 2.

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TABLE 2

Influences of Key Forces on Scenario 2: Resource Restoration

Key Force	Nature of Its Influence on This Scenario
Global Responsibility	<ul style="list-style-type: none"> • Regionally based geopolitical alignment exists in all areas of the world. • United Nations coordinates actions of leading developed nations that oversee less-developed nations, following the European Union and Organization of American States examples. • A “global democracy” may be the ultimate objective for mankind, but lessons learned in the “Arab springtime of democracy” will affect its nature. • Regions are more likely to be influenced by policies that affect their immediate neighbors than those intended to affect the entire world.
Consumer Awareness	<ul style="list-style-type: none"> • Consumers have become aware that their buying criteria must include not only performance and quality but also the environmental impact of their purchases. • Consumers flock to the Internet to determine the environmental impact of their personal purchases of “durable goods.” • Internet information shapes their personal buying trends. • Business-to-business procurement follows the consumers, leading to a “go green” campaign that increases sensitivity to the environmental impact of the entire supply chain.

Globalization	<ul style="list-style-type: none"> • Mankind has come to grips with the global ecosystem and the interconnectedness of national, regional, and global infrastructure. • Commitments have been made to work together across boundaries to address and resolve regional and global problems. • A regionalized division of the UN has created spheres of influence for all major geo-political areas, eliminating typical political posturing for leadership and “equal rights” with respect to decision making. • Brazil has taken the role of influence-shaper for South America, China for Eastern Asia, India for the Middle-East, Russia for Central Asia, and the EU and America continue their traditional roles. • The African Union has increased its political strength and established a close mutually-beneficial relationship with the League of Arab States. • Nations pool their resources and outsource governmental activities that can be consolidated. • “Cloud computing” services have reduced the cost of local investment in information technology infrastructure and the human capital investments required to manage common governmental services.
Increasing Rate of Change	<ul style="list-style-type: none"> • Global leaders have grasped the need to manage some forms of change. • Control of new products no longer involves patent law for protecting intellectual property. • Instead, laws focus on controlling production of durable goods by granting licenses to use new technology but only when consumption of natural resources is required. • Cloud computing has led to standardized computer systems, more natural software migration paths, and less end-user anxiety as changes occur. • Human systems and processes are more stable and reliable, delivering expected outcomes. • Changes are tested and approved fully by users prior to implementation, rather than foisted upon mankind by producers. • Power in production management has shifted toward customers.
Workforce of the Future	<ul style="list-style-type: none"> • Literacy goes beyond basic education in reading, writing, and arithmetic and now includes systems, statistics, and quality as an advanced level for global citizens. • Workers can become either a “certified production worker” or “certified service provider,” by mastering and demonstrating entry-level proficiency in both theory and application of these core job competencies. • Developmental pathways for workers of the future are less functionally constrained. • Individual development plans foster personal growth from the apprentice level to the craftsman level in all recognized work disciplines and vocations. • Performance at each higher skill level leads to both economic benefits and esteem (recognition) for workers.
Aging Population	<ul style="list-style-type: none"> • Senior citizens have become elder statesmen and mentors, leveraging their knowledge and experience to resolve problems associated with the “me-first” trap of runaway consumption. • The elders are teaching mankind the benefits of austerity and stewardship of natural resources, which is based on the fundamental principles of all organized religions in the world and causing people to examine more carefully “what unites us” rather than myopically focusing on “what divides us.”
21st Century Quality	<ul style="list-style-type: none"> • Business excellence, Lean production, standards conformity, Six Sigma, and other quality-oriented communities have merged to create a more coherent approach. • Application of all the quality sciences and practices now is focused on a common goal for the benefit of mankind—improving the global quality of life. • Centers of quality competence (e.g., reliability, statistics, auditing, etc.) support communities of practice (e.g., healthcare, education, government, industry, service, etc.) and coordinate the use of best practices across organizational and regional boundaries.
Innovation	<ul style="list-style-type: none"> • Technology firms have set a new standard for cross-company cooperation through “collaborative engineering.” • Collaborative engineering consortia pool their technological prowess and intellectual property for the benefit of entire industries. • Governments recognize the value of this resource efficiency by providing significant tax incentives for completed projects that are approved by cross-industry consumer panels. • Development of environmentally-friendly technical solutions has become the imperative, forcing a wartime response requirement for focused technical breakthroughs. • Research and engineering now are required to innovate “on demand,” generating continuous and systematic improvement. • Innovations must resolve focused problems effectively, efficiently, and economically.

Scenario 3: Death by 1,000 Cuts

Petty bickering among liberal and conservative political parties in world governments led to significant delays in developing a collaborative global approach to the pressing, population-driven, anthropogenic changes in climate. Continual questioning of scientific methods and interpretation of data has led to arguments about the meaning of the symptoms, sources of chemical pollutants, and key interrelationships among various factors. Furthermore, the reality of solar pacification finally struck home after four years of rapidly decreasing temperatures coupled with negligible sunspot activity. Although this convinced politicians that action was required, the change process was inhibited by a breakdown in political will.

While time was invested to convince all constituents that they must be active in the change, the following developments occurred:

- At first, the global population continued to grow beyond the level of sustainment, reaching 10 billion inhabitants. At that point, the population stabilized to the rate of replacement.
- Global drought from climate change exacerbated the short food supply, and famine became widespread among both developed and developing countries.
- Food distribution systems were no longer able to support the dense population centers in megacities or the wide population spread in rural areas.

- Riots erupted into mob violence in megacities as criminal gangs took over distribution of the new drugs of choice—milk, bread, and eggs.
- Governments called for the military to manage food distribution across the 600 global megacities, and citizens migrated to the countryside in desperate search of food and water.
- Developing countries with agrarian economies increased their value as global partners while world-leading countries scrambled to protect their economies.
- Rigidly polarized political positions caused delays in making decisions and implementing technical solutions, so the world fell behind the power curve for corrective action.

It now appears that the ecological imbalance in nature may require a century or more for restoration. Although repairs finally have been initiated, humanity will suffer through the long recovery period. Widespread panic instigated many parallel actions to improve the situation, but systemic quality tools were not used to improve the environmental operation continuously. It was a case of too little, too late and without the proper focus.

How did the key forces affect this scenario? Table 3 provides a summary of their involvement.

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TABLE 3

Influences of Key Forces on Scenario 3: Death by 1,000 Cuts

Key Force	Nature of Its Influence on This Scenario
Global Responsibility	<ul style="list-style-type: none"> • Mankind has been globally irresponsible for many centuries and lackadaisical inertia is endemic. • Delayed action resulted in increased pollution and enhanced the negative effects of climate change. • Shock therapy was needed to reverse this historical trend and focus popular opinion on addressing issues that require unpopular choices. • The net effect is a renaissance of positive global socialism—“global goodness”—that cuts across religious, racial, and cultural barriers. • Developing security in livelihood for all of mankind is the new focus.
Consumer Awareness	<ul style="list-style-type: none"> • Consumers’ awareness has increased, but purchasing choice options have diminished; dependability of core functions at the best price point has become the emerging definition of “exciting quality” in products. • Market pricing does not tolerate the cost effects of poor design processes or waste in materials or operations. • Customers require assurance that products will last for the advertised lifetime. • Reliability, rather than overly aggressive marketing promises, drives this marketplace.

Globalization	<ul style="list-style-type: none"> • Globalization has begun to shrink in focus; regionally based collaboratives, based on negotiated positions among national members, are prevalent. • Nations were unable to build a “global cohort,” so they initially focused on increasing their standard of living through consumer-based development, but this self-centered approach collapsed as global supply chains disintegrated. • Businesses then transitioned to crisis-mode operations, which had a hugely negative effect on both national and global economies. • As enlightenment dawned, people began to realize that what adversely affects any of us adversely affects all of us. • Recognition that true democracy requires a global distribution of wealth that is sufficient to assure equitable quality of life for all people led to an understanding that global economics cannot be played as a zero-sum game with the world divided into “haves” and “have nots.” • A new basis for economics was born on a global scale—a capitalist Marxist blending that generated a holistic economic system for the good of all people.
Increasing Rate of Change	<ul style="list-style-type: none"> • Climatological systems reeled through major cycles of change; this caused random and radical reactions, rather than traditional linear or exponential responses. • These changes have driven all of the man-made processes and economic forces into reactive modes. • Global decisions were based on selective perceptions, which further randomized the world system’s responsiveness. • Constituencies jockeyed for better positions to obtain their fair share of the limited available resources. • The world was a mess and changed from minute to minute—change became synonymous with chaos. • World leaders finally recognized that they needed to modify many global behaviors to repair the Earth’s natural, economic, and social infrastructure. • Daily management systems and the application of control theory have replaced the focus on evolutionary and revolutionary change in conjunction with the global desire for stability and control.
Workforce of the Future	<ul style="list-style-type: none"> • Risk management and control methods have emerged as the critical leadership skills. • Proficiency in the use of data, measurement, monitoring, and analysis now is required for workers as they support daily management systems. • Process-management and statistical-thinking fundamentals are a core learning requirement. • Multidisciplinary teams working on cross-functional tasks are much less homogeneous, which requires greater interpersonal skills to reach consensus; the value of diversity is truly appreciated.
Aging Population	<ul style="list-style-type: none"> • The global famine and related epidemics affected both the aged and infant populations disparately because they were more vulnerable to health risks. • The world lost a generation of senior citizens and their collective wisdom during the times of strife and turnaround. • Environmental euthanasia offset the imbalance caused by the factor related to the aging population.
21st Century Quality	<ul style="list-style-type: none"> • Quality has been restricted to micro-economic applications rather than to benefit the world’s social system. • New product development is the principle application arena of the quality sciences and provides assurance of product reliability. • Emotive politics overcame the rational decision processes promoted through total quality management. • An independent mediator board of sages validated the science used to make the critical decisions for environmental resurrection. • Quality professionals were accepted as neutral and objective participants in the turnaround process, assuming essential roles as leaders and specialists.
Innovation	<ul style="list-style-type: none"> • Resistance to change has blocked new ideas, and managers now require significant, forecasted return-on-investment for every proposed product. • Innovation, which is synonymous with the development of useful capability, has been stymied under these conditions. • The longer payback periods associated with developing the infrastructure required to recover from past environmental degradation caused government and business leaders to support few innovative environmental technologies.

Scenario 4: Past the Tipping Point

The world's ecological systems suffered a cataclysmic collapse due to man-generated pollution. The ozone layer, previously saved from chlorine, is now under attack by methane. Unchecked increases in the density of carbon dioxide and nitrous oxide have accelerated the warming effects of the other greenhouse gases. The brief respite generated by a period of solar pacification that lasted less than a decade provided an excuse for naysayers to delay addressing the global warming problem. The subsequent events were disastrous, as described below:

- The thermal readjustment occurred so swiftly and was so significant that scientists were unable to thwart a global meltdown of the polar ice caps and all major mountain glaciers. This raised the ocean surface approximately one meter, adding even more pollutants to the ecosystem.

- The resulting acidification of the oceans caused the loss of major fisheries and coral reefs around the world.
- Coastal residents fled to temporary homes on higher ground.
- The population had grown to 10 billion inhabitants, but it rapidly fell to less than 6 billion. The lack of a speedy and effective human response created global chaos, including war, plagues, famine, and pandemics.

At this point the future appears grim. Mankind has taken a quick, giant step backward toward the Stone Age, and Earth's biodiversity has been reduced to a fraction of its pre-pollution era. The ability for the planet and society to recover remains uncertain. Sadly, the survivor instinct that now exists inhibits the close global cooperation necessary to resolve these issues effectively and efficiently.

The key forces described in Table 4 interacted to generate this "doomsday" scenario.

TABLE 4

Influences of Key Forces on Scenario 4: Past the Tipping Point

Key Force	Nature of Its Influence on This Scenario
Global Responsibility	<ul style="list-style-type: none"> • Mankind has acted irresponsibly, blindly consuming the Earth’s resources in a never-ending desire for more and better durable possessions. • Fractious behavior and selfishness have prevented timely action and adoption of austere ways to achieve an adequate quality of life for all people. • Nations became insular and assumed isolationist attitudes, generally rejecting the principles of social democracy; cross-national cooperation was negligible. • Global cooperation occurred only when the environmental situation became moribund. • Even then cooperation was laced with mistrust because developing nations remained skeptical regarding the motives of developed nations.
Consumer Awareness	<ul style="list-style-type: none"> • Consumers continued to enjoy greater, better, and faster product functionality, highly valuing luxury brands—until the global collapse occurred. • Immediate consumer backlash caused many unreliable luxury brands to lose value and to disappear. • The economy contracted greatly as consumption focused on essential existence of family units. • White-collar workers suffered disproportionately because they did not have anything perceived as valuable to trade in the barter-driven markets.
Globalization	<ul style="list-style-type: none"> • Social, economic, and political systems collapsed in conjunction with the failure of the ecological system. • Megacities were affected most because their infrastructures depended so strongly on external support systems. • Megacities, which had been hubs for global commerce and dialog, became dysfunctional war zones where people fight to survive. • Globalization and cooperation have ceased.
Increasing Rate of Change	<ul style="list-style-type: none"> • When the global collapse occurred, the increasing rate of change stagnated and then reversed into a constantly declining state of degradation. • The climate change has had a drastic impact on life, so humanity now is operating on a survival-of-the-fittest basis, scavenging for the means to exist for another day. • Energy systems, clean water, nutritional food, adequate shelter from increasingly harsh weather, and transportation for moving goods between communities are required to preserve society—as in a war-torn country.
Workforce of the Future	<ul style="list-style-type: none"> • Skills that were once highly valued are worthless in the new “survival-based” economy. • Mankind’s reversion makes skills such as foraging, hunting, fishing, and camping essential; only people who can adapt and live without previous conveniences are able to endure.
Aging Population	<ul style="list-style-type: none"> • Global warming diminished the survival rate of the elderly and the young.
21st Century Quality	<ul style="list-style-type: none"> • Maintaining quality of life and climbing Maslow’s hierarchy to sustain homeostasis at the existence level are the primary purviews for applying quality principles and practices. • Achieving subsistence products and transferring survival knowledge from generation to generation are the outcomes emphasized in quality initiatives.
Innovation	<ul style="list-style-type: none"> • Structural innovation has been set aside in favor of essential, local innovations that are both necessary and sufficient for assuring the basic qualities of life. • Innovation, as a factor in improving the condition of mankind and the planet, has become passé; the value system supporting that socially-focused approach has died.

Implications



Many of the comments this year are not exactly new. Threads of the comments have filtered through the successive reports. Much of the future described in 2008 is the future described in 2011. But it is a future that we are closer to now. The implications become all the more important. We are playing a game of degrees, built from the past.

The financial crisis has put some of the issues into play, perhaps more quickly than anticipated. Quality professionals are not isolated anymore but brought into the fray. This is a double-edged sword for some. While being integrated into the organization in a meaningful way does alleviate awareness issues, it doesn't necessarily give credence to the unique and important nature of quality. Will integrating quality throughout the organization diminish the power of the methodology and the professional? No, say many of the panelists who see this change as an opportunity as the quality professional is asked to become more involved in decision making, moving up the management chain and making sure their organizations are ready for business.

"Excellence will be the entry point," exclaims William Denney, CEO, Quality Texas Foundation. No longer will it be OK to strive for excellence, products and services must enter the market without error, meeting—and exceeding—customer needs. Navin Dedhia, quality management consultant, confirmed this statement by noting that design functions will be checked in the early stages of product development so that there would be no rework or scrap.

With products and service handled, quality is free to look beyond the 20th century boundaries and explore sustainability, servicing the community, and world betterment. What the experts made clear is that quality must be better positioned with new performance criteria. Quality also insinuates itself into regulation, knowledge transfer, and training.

To accomplish this, the panelists agree that quality features need to be re-thought. It is no longer acceptable to view quality in such a narrow way. Quality cannot get in the way of loftier goals. "TQM acts as a brake," is how John Elkington, founding partner and executive chairman, Volans, addresses this. To move into world betterment, innovation is a daily imperative. But unlike past years, there is less concern that quality competes with innovation.

Quality will become more transparent, not just in the workplace but in everyday life. Quality becomes more inclusive and pervasive. And the metrics must be simpler.

"In the future, quality will be a measure to understand which product is more comfortable to human, society, and earth. Quality of human life will be focused on."

—Hitoshi Kamikubo,
Associate Director, Union
of Japanese Scientists
and Engineers (JUSE)

What follows is a distillation of the expert's reactions. Some of the comments fall in line with past study statements. Other comments challenge the past with new insights. Still other comments offer caution, calling on quality professionals to look forward but never turn a back to history.

Through all of this Joseph De Feo, president, Juran Institute Inc., warns us not to "lose sight of the fundamentals."

Here is a list of the themes that emerged from the comments, divided in three sections:

Implications for Quality

"Quality is returning as a priority subject (on the) executive's agenda."

—Eduardo Guaragna, Director, PGQP, Brazil

- Across continents, countries, and cultures, quality is a common language. Quality must adapt to customer needs in a specific socio-geographical way. Eventually quality will evolve to enable servicing of communities and brands will adapt to local cultures.
- Quality should shape society. Ultimately, quality methodology will be used to build a better world.
- Quality needs to be more inclusive in its approach and more pervasive throughout systems and communities. There is an overall lack of understanding of the depth and breadth of quality.
- Quality, as a discipline, cannot afford to stand alone anymore. Quality must be seen as aligned with other performance criteria.
- Quality metrics are sturdy. Quality metrics are comprehensive. Quality metrics must become simpler to have any staying power outside the quality profession.
- As more people become aware of quality methodology and put it to practice on the job and at home, quality becomes more transparent in daily life.
- As quality evolves and transforms it is important not to lose sight of the fundamentals.
- Innovation does not compete with quality. In fact, they complement one another very well. Innovation tools need to be incorporated into the quality toolkit.

- Excellence is the market entry point. Design functions will be checked early in the process. Scrap and rework will be further reduced and non-value-added activities will be permanently eliminated.

Implications for Organizations

"Approach quality concepts beyond the quality of product, referring to the quality of organization with all its components and aspects."

—Cornelia Butnaru, General Manager, RO
Quality International Management Services,
Romania

- Any successful organization will begin with highly ethical leadership. There will be a shift from quality management to quality *of/in* management.
- Far beyond fulfilling a market need, the quality organization will be useful to society.
- Quality methodology will be deeply embedded throughout an organization—all positions and into every relevant process. Any organization not fully committed to an excellence framework will be at an extreme disadvantage.
- While quality methodology addresses systems quality, organizations must approach quality beyond the product and service.
- Organizations need to be nimble, quickly reacting to the changing business climate. Speed and flexibility are key to business survival.
- Quality organizations have focused on waste reduction for many years. That certainly won't change. However, creating and implementing sustainability programs will become increasingly important.
- Innovation will be more than talked about, it will be fostered and work with quality initiatives.
- Organizations will have a greater range of tools available to them to make quicker, more accurate decisions.
- The use of nanotechnology will be critical to a technology-based organization's success.

- As the world becomes smaller and businesses become more global, organizations will find the need to recruit globally to ensure they have a diverse set of skills in key areas. Recently retired individuals will likely become semi-retired while workers turning retirement age will elect to stay in the workforce.
- The dwindling department does not spell doom for the quality professional. On the contrary, this is good news. There will be more opportunities for the quality professional in management. The progression could look something like this:

Implications to the Quality Profession

“The scope of quality...will be to encourage novelty and innovativeness in consumer experience.”

—Sunil Sinha, India

- While the workforce continues to age, retire, or move to other professions, it is a good time for quality professionals to become coaches for organizations as well as mentors for young workers.
 - Think strategically. Lead holistically.
 - The profession has been changing over the past few years—sometimes based on the natural maturation of the profession, other times because of the economic climate. Change will continue.
 - Quality professionals will need to be willing to significantly change the way in which they think of their jobs and themselves.
 - Stand-alone quality departments could very well be things of the past. As quality infiltrates organizations, it would only logically follow that stand-alone departments would no longer be needed.
- Line/middle managers move into roles of responsibility that include monitoring quality practices/initiatives. Quality professionals move into higher levels of the organization with more decision power as oversight of quality learning and training.
 - To accomplish this, however, the quality professional will need to prepare for the scenario. Many of the experts mentioned that quality professionals must broaden their skill set—a skill set outside of the typical quality, statistical, and technical regime. Panelists noted that knowledge in the humanities (psychology and sociology), business management, and knowledge transfer, will be essential in the near future.

Further

Emergence



The Course of Change Over Time

Deborah Hopen

President, Deborah Hopen Associates Inc. and ASQ Past Chair

ASQ now has completed six Future of Quality Studies, and it now seems appropriate to take a look at the longer-term perspective these analyses provide. As might be expected, some of the key forces identified appear more regularly than others, but the specific nature of those forces has shifted since the first study in 1996. The table on page 32 presents a high-level summary of those key forces.

Globalization

When viewing the summarized key forces, it becomes instantaneously obvious that globalization is the one constant across all of the futures studies. That conclusion may be a bit misleading, however, because the effects of globalization have not been consistent over the past 15 years. In fact, globalization has interacted with quite a few of the other forces over time, generating a substantially different operational climate for modern organizations.

Globalization and Technology. It is impossible to ignore the effect the increasing pace of technological change has had on globalization. Whereas the Internet and ecommerce were newly emerging realities in 1996, they are an everyday business method in 2011. At the time of the first study, organizations had begun to discuss the threat of Y2K and were trying to predict what technological advances would occur in the new millennia. The computer was viewed as the primary technological platform, and almost everyone was learning to traverse the information highway. Not many people guessed, however, that cell phones would become the new computers of 2011, taking over many everyday business and personal applications. According to the Child Trends Data Bank, “In 2009, more than three out of four children (77 percent) ages three to 17 used the Internet at home, more than three times as many as in 1997 (22 percent). Ninety-three percent had access to a computer at home, up from 15 percent in 1984.” (www.childtrendsdatabank.org/?q=node/298) With the increased use of cell phones, email, social networking software, and other similar options, communications are almost instantaneous, and the ability of individuals or organizations to keep problems a secret is almost non-existent.

Furthermore, the “technology of technology” has improved, decreasing the cost of development significantly and making new tools more affordable. The list of technological changes since 1996 and a discussion of their effects is beyond the scope of this analysis, but one thing is clear—technology is making it possible for globalization to expand to the far reaches of the world and to do so more rapidly and at a lower cost.



Globalization is the one constant across all of the futures studies. That conclusion may be a bit misleading, however, because the effects of globalization have not been consistent.

Globalization and the Marketplace. As many organizations began to conduct business across the globe, they were faced with difficult choices regarding products and service design and delivery. In 1996, it was noted that the focus on customers was increasing. By 1999, the need for customization and differentiation of products and services and shifting demographics offered implications relating to future requirements for goods and services. In this most recent study, it has been noted that consumers are becoming increasingly aware of their options; are learning more quickly of positive and negative attributes of products, services, and the organizations that provide them; and are expecting more responsive offerings. Although it is well-understood that people from different cultures with different lifestyles will have different expectations, the rapid spread of the global marketplace has forced organizations to grapple with the need to customize offerings appropriately versus the cost of doing so—and that cost includes the effects of increasingly complex operations in a world that is aggressively pursuing simplified processes with less waste.

Globalization and the Workforce. As organizations expand their realms, it is inevitable that the way they conduct business will change. Technologically-based services can be provided from any location, so there has been a shift since 1996 to outsourcing that often occurs outside the sponsoring organization's homeland, as was mentioned in the 2005 key forces. On the other hand, it may be more effective and efficient to produce and/or deliver some products and services near the customer base, which may be addressed through partnering (predicted in the 1999 study), outsourcing, and/or local operations.

Beyond that, however, is the effect of rising immigration rates across the world which also has a profound influence on workforce trends. In 2006, the Population Division of the Department of Economic and Social Affairs of the United Nations Secretariat reported, "In 2005, the number of international migrants in the world reached almost 191 million, which was 3 percent of the world population. Between 1990 and 2005, the world gained 36 million international migrants."

On one hand, these dynamics place new demands on organizations, including how to keep far-flung employees up-to-date and trained. On the other hand, the rise in knowledge management systems and self-paced training are proving to offset some of these issues. Interactions among workers, customers, and stakeholders associated with language and cultural differences still remain a challenge for many organizations, however.

The aging population that has been mentioned in the two most recent studies also is having an impact on organization capabilities, and that trend can be expected to continue for quite a while into the future. The newest members of the workforce, the millennial generation, bring new ideas and approaches, but they lack the wisdom of experience which is being lost as the baby boomers retire. This drain not only decreases the opportunities for mentoring, but it also changes the ways leaders must manage the workplace.

Globalization and a New View of Individual and Organizational Responsibility. As early as the 1999 study, "Environmental Sustainability" was included as a key factor. In 2008, both "Environmental Concerns" and "Social Responsibility" made the list. The current study raised these issues to a higher level, called "Global Responsibility." There is a growing understanding of the relationship between individual and organizational decision making and the sustainability of this planet. The need to scrutinize every decision for its potential ramifications on consumers/customers, workers, communities, and the environment has become an organizational imperative, as stakeholders focus more closely not only on products and services but also the footprint organizations create and as a byproduct of their operations.

The Role and Practices of Quality

When ASQ launched its first Future of Quality Study in 1996, the intention was to provide members and other stakeholders with a view of key factors that might influence the profession and the application of associated principles and tools. At that time it was recognized that quality had begun to be introduced to new areas, including healthcare, government, and education. Furthermore, it had become obvious that the role of quality as a specialty function was shifting, and quality was becoming an organizational leadership and management strategy. The need for quality professionals to prepare to integrate their fundamental knowledge and skills with broader managerial assignments was clear. The future focus would be on creating value for the organization.

Over the next six years, this prediction increasingly became the reality as quality-related duties gradually were absorbed into management systems, and the responsibility for quality was incorporated into every job. An economic downturn had occurred at the beginning of the new century, and growing pressure existed to prove emphatically that quality was more than a "feel-good" concept and that it made an incontrovertible contribution to economic success and long-term viability.

By 2005, a new concept of value creation had emerged—the triple bottom line (societal, environmental, and financial results)—and quality practitioners were being required to think and behave differently. Whereas the historic focus had been on processes and their inputs and outputs, a greater understanding of the more complex effects of systems of interdependent processes on performance outcomes had evolved. The competencies for individual success changed substantially, requiring equal attention to both the strategic and tactical levels. Additionally, the traditional technical tools were no longer sufficient; a wide range of people skills were necessary to build knowledge, skills, and commitment within the workforce.

So, where will the quality profession go next? The panelists in the current study believe that it will escalate to the enterprise and inter-enterprise levels. Interactions among organizations will become increasingly important with the opportunity for disconnects to

generate widespread and rapid negative consequences because of globalization and technology. Once again, individual success will be determined largely by an individual's ability to learn to adapt and grow professionally—quickly and continually.

Preparing for Change

Complacency is not an option, and it hasn't been for many years. Key factors related to change and innovation have appeared in most of the ASQ Future of Quality Studies. ASQ, its members, and other stakeholders need to continue to be prepared to address any new challenges that emerge creatively—whether they relate to values, approaches, techniques, or other areas. Clinging to the past is certain to jeopardize personal and organizational success in a world that moves at today's pace.

Although it's true that no one can predict the future accurately, the studies ASQ conducts do provide invaluable insight into the key factors that are expected to have influential effects. Looking back over the six completed studies, it becomes clear that we can chart the course of change over time and use that analysis to take advanced action to prepare for the changes that will occur.

SUMMARY OF KEY FORCES IN ASQ FUTURE OF QUALITY STUDIES						
	1996	1999	2002	2005	2008	2011
1	Changing Values	Partnering	Quality Must Deliver Bottom-Line Results	Globalization	Globalization	Global Responsibility
2	Globalization	Learning Systems	Management Systems Increasingly Will Absorb the Quality Function	Innovation/Creativity/Change	Social Responsibility	Consumer Awareness
3	Information Revolution	Adaptability and Speed of Change	Quality Will Be Everyone's Job	Outsourcing	New Dimensions for Quality	Globalization
4	Velocity of Change	Environmental Sustainability	The Economic Case for a Broader Application of Quality Will Need to Be Proven	Consumer Sophistication	Aging Population	Increasing Rate of Change
5	Increased Customer Focus	Globalization	Global Demand for Products and Services Will Create a Global Workforce	Value Creation	Demand for Healthcare	Workforce of the Future
6	Leadership	Knowledge Focus	Declining Trust and Confidence in Business Leaders and Organizations	Changes in Quality	Environmental Concerns	Aging Population
7	Quality in New Areas	Customization and Differentiation	Rising Customer Expectations		21 st Century Technology	21 st Century Quality
8	Change in Quality Practices	Shifting Demographics				Innovation

Looking to the Future From the Rearview Mirror

Paul Borowski

ASQ CEO

with insights from the 2011 Future of Quality Study Panel

As we began the 2011 Future of Quality Study, it occurred to us that we've finished the first decade of the 21st century—the century that, Dr. Juran said, could be the century of quality. I thought it would be instructive to ask the futures panel to reflect on the past to gain insight about how quality has evolved. Since 1996 the futures study has given us a framework and context to anticipate change; hopefully many have looked ahead and acted proactively for the changes we anticipated.

Quality has changed. The panel reflected on the changes they experienced. The text below reflects a summary of the panel's reflections.

It comes as no surprise that the insights and opinions of the panel vary. Few on the panel describe a status quo where quality is limited to notions of product and the processes of production and where quality is confined to a department. This would represent a traditional view of product-oriented quality in the 1980s. A few panelists point to evolution of quality but at rates well below those that assure an expanding role for quality, and those who practice it, to play in the improved performance of an organization. These two perspectives represent 15 percent of the panelists.

The vast majority of the panel (85 percent) points to increasing attention to the importance of quality, along with evolution—change and expansion. However, the time frame for observing change was not limited to the first decade of the 21st century. The panel's insights are often cited as the product of a 25-40 year career. There are similarities to the observations that appear as patterns that I've attempted to highlight. You might consider three uses of these patterns:

1. **Gauge Your Progress**—Is your organization experiencing these changes? The answer will give you a sense of the progress being made, or the opportunity for progress, in your organization.
2. **Focus on Results**—Are the changes in quality delivering results in your organization? Reviewing these trends may afford you the opportunity to strengthen, abandon, or adopt initiatives to increase the contribution of quality in your organization to deliver improved results.
3. **Prepare for the Future**—As you consider change, or needed change in your organization, what new skills and abilities will be needed to assure success? Use the answers for your personal development plan and as inputs to use in developing your workforce.



The vast majority of the panel (85%) points to increasing attention to the importance of quality, along with evolution—change and expansion.

A Larger Role for Quality in Strategy

Quality, the panel observes, is increasingly seen for its strategic contribution. In organizations using quality at the strategic level there is a keen focus on the customer. It is anticipating customer needs, understanding customer needs, ensuring those needs are clearly translated into the attributes of the product/service, and then managing performance that leads to customer satisfaction, delight, and loyalty. The customer leads the executive agenda and quality gets a seat at the table. In fact, customer-centered quality performance may be the first topic of business reviews. The contributions of quality are understood as integral to the realization of strategy and the success of the whole enterprise with top-line contributions—increased sales and market share—and bottom-line contributions—efficiency. Metrics evolve as quality evolves and as quality becomes more strategic the measures of the contribution quality makes should evolve too. To the traditional product measures of defect rate, rework, scrap, and warranty costs add satisfaction, loyalty, experience, engagement (customer and workforce), speed to market, earned share of market, energy efficiency, innovation, relationship quality, trust, and social responsibility.

Enterprise Quality (or Enterprise Excellence)

Organizations are realizing that product/service quality is a minimum requirement in the 21st century and that product/service quality alone is not sufficient to assure an organization's competitive advantage. These organizations increasingly look to the quality of management applied to the entire organization as a source of sustainable competitive advantage. A senior executive of a large Indian company said that the quality of management is far more important to the sustainable success of the enterprise than product quality because product quality can be changed quickly. The DNA of the organization takes years to develop and when management programs exist, years to change. Most of the panel cited a national or regional performance excellence framework such as the Baldrige Performance Excellence Program, EFQM Excellence Model, or Global Performance Excellence Award as an essential aid for those leading sustainable improved organizational performance.

Expanding Complexity and Scope

There is an observable continuum of evolution in the application of quality. In early applications quality was a function of inspection and sampling after production. Then quality moved upstream to quality assurance—the methods of assuring the quality of production so there would be fewer defects. This was often based in understanding and optimization of processes. Then systems thinking arrived to satisfy the insight that there are limits to the benefit of process improvement until you understand the interactions between the processes as they form a larger system. Then came the realization that an enterprise was itself a system that could be managed for improvement over time. And today the leading edge of quality practice has come to the realization that there is a system larger than the enterprise which may also be managed for improvement. Supply

chain is an example of quality coming out of the organization and applied to something larger and more complex. But even beyond supply chain, organizations are beginning to talk about networks, communities, and ecosystems as the scope to be managed. And with each evolutionary step came more complexity, and with that complexity new approaches to managing quality. To paraphrase Adam Kahane—simple problems can be solved with simple tools. Complex problems require different concepts and techniques.

From Product/Service Centric Quality to Experience Centric Quality

Most mature organizations understand the near perfect product quality is a minimum requirement in today's competitive environment. Customers expect perfect products and defect-free services. The age of Internet and social media gives organizations little time to recover from their mistakes. Moreover, in today's world of thin margins, the costs of rework and warranty can often make the difference between profit and loss. As organizations find that product/service quality is a minimum requirement they look to something else to differentiate themselves in the market. The label is experience management—the notion of managing every aspect of the customer experience to deliver quality. We saw this first in the entertainment industry, but it is increasingly common in hospitality, education, healthcare, and business-to-business industries. The customer's experience is being designed, manufactured, and managed.

Quality Culture

The old adage was “if we (the quality profession) do things right, quality will become everyone's job” and it became true. Quality lies at the foundation of everything the organization does and is becoming ingrained in the way people think. If once quality centered on the tools and techniques, it is evolving toward a culture of excellence—a pervasive mindset. The tools, one panelist noted, are inert until someone uses them. It is the passion of people and their commitment to excellence that makes tools and techniques powerful. In environments of rapid change leaders rely on the culture—along with the requisite tools and techniques—to give the organization resilience and agility. A quality culture integrates quality in every aspect of management. Or as one panelist said, “quality is woven in to the culture.”

Waste Reduction

Perhaps the first 10 years of the 21st century, spurred by the worldwide financial crisis of 2008, were preoccupied with waste reduction and the associated contribution of reduced waste to the bottom line. Organizations used the tools of lean and Six Sigma to systematically root out waste. While the gains of these efforts move directly to the bottom line of organizations, there is a concern that leaders might conclude the only contribution of quality is the reduction of waste. While the reduction of waste is clearly a contribution that quality delivers and while waste in all its forms will become increasingly abhorrent to society faced with the reality of a globe of finite resources, the quality community bears responsibility to speak up and offer the full complement of benefits quality can bring to the enterprise and represent the voice of the customer.

Quality in Every Field of Endeavor

While certainly not a trend that started in the 21st century, quality, once the almost exclusive domain of manufacturing, has grown into every sector of the economy—service, healthcare, education, government, and nonprofits. The concepts, techniques, and tools have proved to have universal applicability. It takes wisdom to know what concept, technique, or tool to use in a given setting and given maturity level. There are risks associated with leaders selecting the wrong tool and concluding quality doesn't work. Mitigating this risk is a key role of the quality community and in a world driven by “what's new” it's sometimes hard to accomplish. It may well be that an old tool is the most appropriate tool to use. Remarkable results have been noted in the field of drug and alcohol treatment facilities using nothing more sophisticated than the Plan-Do-Check-Act cycle. The concept, technique, and tool must fit the need and the experience of those who will use them.

New Roles for the Quality Leader

If once the role of the quality leader was to be effective in detecting defects and preventing defects from getting to the customer, the traits of success were being hard-nosed and inflexible. Today the successful quality leader must have outstanding soft skills. Still the knowledge of statistics, defect prevention, process controls, and industrial experiments are needed but also required are the skills of language of finance. Today's quality leader advocates for the customer and communicates throughout the supply chain and the organization. There are no boundaries where these skills are not welcomed and quality leadership is no longer limited to a quality department. Leadership can come from anyone in the organization with the right mindset and the right tools.

Another Point

While not a trend, there was another insight that may be obvious but should not be left to chance. That insight is that quality is not universally understood and applied. One panelist described the “haves”—those who get quality, use quality, and lead through quality. They enjoy positions in the market that we admire. There are the “needers” who are told they need quality and just want someone to go out and buy it for them. And there are the “clueless” who don't know what they don't know. The general sense of the panel is that the percentage of “haves” is increasing, but slowly and not equally around the globe. This is worth thinking about. The greatest risk may not be your internal rate of improvement but the comparative rate of improvement. Complacency may be more dangerous than ever. Whether true or not there were several comments that small and mediumsized organizations generally lag behind larger ones. If true, it represents an opportunity and a challenge. If quality has not been embraced by smaller organizations, why? How can the quality community adopt their concepts, techniques, and tools for the needs of leaders in small and medium-sized organizations? There's an opportunity there.

The Future of Organizational Quality

Harry S. Hertz

Director, Baldrige Performance Excellence Program

ASQ's futures study identifies eight forces of change. Here are my thoughts on how these factors will affect enterprise management and hence organizational quality. I'll begin by describing three overarching factors, then I'll address their potential impact, and finally I'll share my (wild) speculations about possible outcomes.

Overarching Factors

In my opinion, the three overarching factors are complexity, agility, and ethics/social responsibility.

Complexity. The complex nature of economic, business, and social systems will challenge organizations and their ability to survive and thrive. Leading an enterprise in this uncertain environment will also entail complexities. I envision a tension developing between global sourcing and competition on one side and local pride and protectionism on the other. Cost and variety will drive the need for globally-focused businesses and customers. Protectionism, social responsibility, and local well-being will drive local sourcing and a desire to buy locally. All businesses, but especially global companies, will face internal pressures to source for price and availability and, at the same time, to support local communities and reduce the waste and energy consumption associated with packaging and preserving products when shipping them long distances.

Agility. Organizations will need increasing agility to address the pressures of complex economic, environmental, and social systems. Strategy will be complex, reaction times short, and execution quick to take advantage of opportunities and resolve challenges. The ability to change strategy quickly and execute those changes will require even greater agility.

Ethics/social responsibility. I already touched on the likely demands of social systems in regard to complexity. Well beyond those considerations is the global expectation, and indeed need for organizations to act responsibly to protect the environment and to be good citizens in their local and global communities. I easily can foresee first the large-scale voluntary and then possibly mandatory reporting by organizations of a high-level social responsibility index—a formalized compilation of some current corporate responsibility indexes, merging carbon footprint, waste



Strategy will be complex, reaction times short, and execution quick to take advantage of opportunities and resolve challenges.



of all types, and societal service data. An index of this nature could affect business-to-business decisions (e.g., we only source from companies with an index greater than 95), consumer buying decisions, and maybe even tax credits and bases.

Effects of Overarching Factors

I believe that innovation, work systems, and organizational core competencies will be most affected by these overarching factors, as follows:

Innovation. The role of technological innovation comes to mind first, and certainly the pace will quicken and products of nanotechnology, biotechnology, and quantum technologies will lead to unimaginable advances. I would like to focus, however, on process and business model innovation. We will need to develop extremely flexible, adaptive processes to meet the previously described challenges and to address business and consumer needs and desires. Furthermore, imagine the business model innovations necessary to meet the demands of novel global and local, flexible, and co-located and distributed organizational workplaces and leadership teams. Every mix of processes and business models will be needed—possibly simultaneously.

Work systems. Changes in this area flow from the innovative processes and business models. Expect innovations in how and where work will be accomplished and how flexible work systems will need to be. Decisions related to “in-house” (whatever that may be) versus supply-chain and partner contributions will face constant challenges—especially when global versus local production factors are involved. Of course, all of these effects create fodder for leading the enterprise and managing the workforce of the future.

Organizational core competencies. Work systems go hand in hand with core competencies. How will the development of intellectual property (IP) at warp speed affect IP protection rights and the patent process? Will organizations stop trying to protect intellectual property, and how rapidly will core competencies need to change to succeed under those conditions. The speed of changing requirements could impact the basic mission of the organization. Organizations will be challenged to identify blind spots that lead to the need for new competencies, products, and services to ensure long-term sustainability. The days of an organization having a core competency that lasts for an entire workforce generation already are behind us. Now we must ask how the speed of change will influence our need to develop and protect core competencies for a competitive marketplace advantage and how changing organizational core competency needs will influence workforce needs and skills.

Speculation on Other Possible Outcomes

My thoughts on other possible outcomes start with the future for educational institutions—particularly higher education. With the need for rapid change, lifelong learning, and rapid curriculum evolution, the functions of a traditional residential university education will be tested. We already are seeing a dramatic growth in distance learning, which is likely to continue. Educational needs probably will be fulfilled at multiple “institutions.” The role of residential higher education degree-granting programs may focus more on social maturity than subject learning, which will be distributed and could require a major redefinition of structure and management of educational enterprises.

The second potential outcome is perhaps the most Orwellian. With mass miniaturization, we may see home manufacturing, where we each make personalized products and manufacturers sell us the plans and raw materials. If this does happen, we need to be prepared to answer the following questions:

- What would this mean for today’s manufacturers?
- How would those new home enterprises be managed?
- What would the workforce do?
- What would the organization’s core competencies be?

Maybe this sounds far-fetched, but I am reminded of a current real-life example—my dentist and the manufacture of crowns. In the past, this was the work of an artisan supplier working from molds and needing multiple “fittings.” Today, a small laser-guided device makes the crown in real time in the dentist’s office, and the crown then is inserted immediately during the same appointment.

Finally, and far less speculatively, I believe enterprise management and enterprise quality will include significant components of regional enterprise collaboration. With a focus on social responsibility and accountability and on community responsibility, leadership partnering will lead to regional enterprises that develop multi-organization supplier-customer relationships. Those relationships will not only be with traditional suppliers and partners but also with partnerships among business, education, and healthcare organizations. Together, they will build social-responsibility index values and sustainable, healthy communities. Large multinational enterprises will need approaches that work equally well in all the communities where they have facilities. This expanded collaboration will challenge competitive situations and core competencies, but the outcomes should be exciting!

I’ll end where I started—with complexity. The ideas in this article may not represent what eventually happens, but hopefully they will stimulate others to think about the enterprise of the future and help us imagine how to deal with very challenging situations and unbridled opportunities. I propose we all meet in about 10 years and have a good laugh about these insights and predictions!

Toward a Definition of Quality

Paul Borowski

ASQ CEO

with insights from the 2011 Future of Quality Study Panel

How is quality defined? While those who participated in the study have a deep appreciation and understanding of quality, it's possible that some readers of the study will ask, "What do you mean, quality?" Perhaps even those working in the field will be interested in an early 21st century examination of what quality means. However, as you will see, defining quality is a difficult task because it has several definitions depending on the occasion.

Over the past 25 years, and probably longer, there has been an ongoing rhetorical discussion on the need to define quality. Statistically 50 percent of the panelists say it is impossible to define quality, the other 50 percent say that without a definition it's unclear what we're talking about. We conduct this study without defining quality. We simply instruct the panel that quality is what you know it to be. I was taken to task by a noted academic researcher who declined my invitation to participate in the study because we do not define quality at the start of the study. Any definition, he said, would be better than none. Statistically I know what side of the discussion he would take.

I invited the panel to share their definitions and offer a few of them to show the range of definitions available and then end this section with the insights of Roberto Saco, a past ASQ chair, when he invited the quality community to entertain the question of defining quality in 2008.

There still is no official definition of quality that serves all purposes. The statistics remain unchanged. Fifty percent say there is no single definition of quality. Fifty percent say there needs to be one.

Quality as Philosophy

- The pursuit of perfect that never ends.
- Quality is conscience.
- Excellence.
- Quality is the fulfillment of needs.
- Quality is the degree of feeling happiness.
- Quality is the intangible that makes a better world tangible.
- Quality is a set of principles and a set of methodologies for achieving the joint benefits of greater productivity, lower costs, better utility, durability, and satisfaction with products and services simultaneously that helps to develop customer preferences for sustained and acceptable use.
- Maximizing the benefit and minimizing the harm to society associated with any product or service.



- Quality is a way of life. It is a culture that makes us work in all our activities with a customer focus and with a philosophy of efficiency and excellence in what we do and in what we produce.
- Quality is the state in which all value entitlements (in its broadest meaning) are fully realized for customers and other stakeholders focused for the present with future considerations.

Quality as a Personal Ethic

- All of us doing, always better, the right things.
- Do the right thing, the right way, the first time, for the right reason.
- Treating everyone like a guest in your home.
- Always going the extra mile to create a holistically-satisfying experience for every stakeholder we deal with.
- The pursuit of excellence and deep understanding of all we do.

Quality in the Eyes of the Customer

- Quality is what the customer says it is.
- Meeting or exceeding my customer's expectations.
- I know it when I experience it.
- My total experience of the provider.

Quality in the Eye of the Producer

- Quality is compliance to a specification.
- Conformance to requirements.
- Fit for use.
- Meeting customer requirements.
- The property of a product or service measured against the needs of the customer.
- A complete set of realized inherent characteristics of products, process, or system to meet (customer) requirements.
- The provision of value to the customer as defined by the customer.
- Conforming to the requirements of the customer.
- The contract between the user and the supplier, between the customer and the producer.
- The value of a company's product/service.

Quality for the Enterprise

- Quality is the true value of worth of an entity.
- Enterprise performance.
- Meeting the needs of customers (external and internal).
- It is the conscience of a company and its fundamental responsibility for its consumers.
- Quality is related to the organization's capacity to satisfy stakeholder expectations.
- Quality is the degree to which the organization meets the needs and expectations of all its stakeholders.
- Meeting the requirements of the customer, the company, and related parts.
- A long-term profitable relationship with co-workers and customers.

Here is a general use definition several panelists mentioned. This statement was printed on a 1980s-era ASQ poster:

“Quality is the systematic pursuit of excellence.”

To conclude this article, a generous excerpt from the Roberto Saco-penned editorial, “Quality and the Three Conversations” is provided as food for thought. This piece was published in *Quality Progress* (July 2008) while Saco was ASQ chair (2008-09) and eloquently states the difficulty of identifying one definition of quality.

Roberto Saco

ASQ Past Chair

Rather than provide an operational definition of quality, I'd like to meander on a more elliptical route. And to this end, I'll take up here one of the threads of my inaugural speech in Houston on May 6. I've said that "quality is more than a profession. We join ASQ as engineers, statisticians, designers, technicians of all varieties and stripes, lab analysts, organizational specialists, psychologists, nurses, teachers, doctors, scientists, consultants, accountants, students, marketers, administrators, public employees ... Yet quality, I propose, is a calling—a calling that transcends whatever happened to be your professional entry point. We are honor bound to improve things. It's in our nature. And when someone asks what we do, I believe we should justifiably say that we're making the world a better place to live in."

I take much of my inspiration here from the recently departed Joe Juran. And the greatest tribute you can bestow on thinkers and leaders is to continue using their ideas after they've departed. Juran gave us many gifts: he promoted the human side of quality; he stressed planning and prevention as a complement to control; he wasn't afraid to think big; he asked us to focus on the vital few.

In this editorial, however, I want to highlight the distinction he made between "little q" and "big Q." As you know, little q has to do with the problems of production and the tactical tools that lead to control and improvement. Big Q was Juran's way of describing quality in a management setting: more strategic, more comprehensive and system-wide—in other words, quality management. It was in Juran's genius to recognize that these are two different conversations. That they apply different languages, in different domains: the shop floor and the board room. And the two conversations, little q and big Q, are indeed complementary. You need both to make quality real, to make quality stick.

Following Juran, I posit that nowadays we, in turn, have to make yet another distinction—what I'll call "really big Q." What is really big Q? Beyond quality control and quality management, we need a better, more coherent conversation around sustainability and responsibility, and we need to do so at a higher level than just the organization or the firm. This is quality at the level of entire social systems, where issues like global warming, business ethics, sustainable economies, ecology, and reciprocity are addressed. These are the issues of today.

Our growing awareness of the interconnectedness and interdependence of things on planet Earth lead us in the direction of systems thinking, complexity, and global reach. And I cling to the belief that if we are not actively addressing these issues and concerns, we won't be relevant for long.

We need then to make room for a third conversation. And just like little q and big Q, really big Q doesn't negate other conversations about quality. We can still talk about probability density functions and Ishikawa diagrams in the first conversation of little q. We can also have a discussion on quality planning and *hoshin kanri* in the second conversation of big Q. We need to have these conversations. They're useful and necessary. Yet, the three conversations can co-exist and even feed off each other to enrich our understanding and cement the value we can provide others. Think of it as a progression from the quality of products and services to the quality of management, and now to the quality of life itself.

Why should there be an emphasis on meaning and cause? Why this broader sense of responsibility? Why should we pay attention to this third discourse, this third conversation?

I recently attended a panel on global need hosted by the University of Oxford. Attendees included representatives from the Rockefeller Foundation. Here are some facts: There are 6.8 billion people in the world. Half of them live on less than \$2 a day. One of every 10 lives with a disability. School life expectancy is an indicator that's highly correlated with country wealth and standard of living; for most of Africa it's six to seven years. This is not on another planet, light years away. It's on our planet, our home.

The third conversation centers on meaning and our place in the world and a need to address not the issues of tomorrow, but the very pressing concerns of today.

I have refrained from using tables, diagrams, and relationship charts—all the marks of a visual thinker—because I do not wish to over impose my imagination on the topic. Instead, if this resonates with you, then it's up to you to make sense of the three conversations and how they relate to quality. The only claim I can make here is to create a context and forum within which these connections can happen.

And, what's more, let it be said that I never promised *QP's* editor just *one* definition of quality.



Postscript

David Luther

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Change happens. As this note is being written, Google has purchased Motorola Mobility, the Dow Jones Industrial Average has had four 400-point swings in one week, tablets are poised to outsell PCs, and Apple, in market capitalization, has replaced Exxon as the largest company in the world. Social media has enabled the Arab Spring, my online book buying probably contributed to Borders' bankruptcy, and local used car prices are higher because of an earthquake thousands of miles away. The worldwide credit crisis has destroyed wealth, public and private, of organizations and individuals virtually everywhere. More stable processes continue, like U.S. population growth, which is steady but declining.

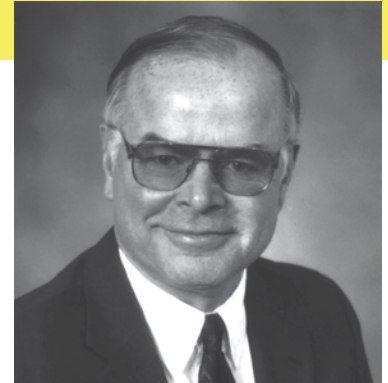
On a more personal basis, our children and grandchildren share with millions of others the difficulties of getting mortgages or even jobs that pay well.

Past futures studies have alluded to some of the above in general terms; however, the fact is we have no idea what is going to happen next week, much less five years from now. Certain large, powerful forces do continue such as the speed of technology change, the increasingly sophisticated use of data and information, the green revolution, and the growth of emerging nations. However, it is extremely difficult to convert general knowledge about any theme into a specific set of instructions advising us what to do differently Monday morning.

The future of quality studies are very useful in making us consider where we are today and what we can do to prepare for powerful change events, both predictable and unpredictable. As the 1996 study pointed out, if we cannot figure out what is going to happen next, we can certainly make sure we have the means to detect change when it starts to occur, and develop the robustness to respond quickly when we are being engaged or even overrun. Preparation works.

To this observer, the most important lessons from past studies are still very much in play. Understand your environment and have sensors deployed that will tell you quickly when change is starting to come your way. Second, look for opportunities. They will exist. See Google or Apple. Third, change, like politics, is local. It is the futures study you create for your organization, your profession, your career, or your family that deserves today's attention.

Bob Galvin, past chairman of Motorola, defined a leader as "someone who takes us elsewhere." That always seemed to make sense. Today, however, that role is shared with change. Our challenge, both collectively and individually, is managing the trip.



Understand your environment and have sensors deployed that will tell you quickly when change is starting to come your way.


Toward

Action


The 2011 ASQ Future of Quality Study is for your use. As described in Paul Borawski’s “Welcome to Emergence,” the study “is about provoking questions about what you want to do in anticipation of the future. Answering those questions makes you agile. Getting to a state of agility requires good thinking and, more importantly, good dialogue.” Now that you have read the futures study, it is time to think, discuss, and act.

On the next page is a brief list of questions to help you guide your future.


These questions—and their answers—will undoubtedly lead to more questions. Continue to engage in a dialogue with quality professionals and practitioners within your organization and communities.



How is my organization currently using quality methodology to prepare for the future? How can the 2011 Future of Quality Study assist in elevating the use of quality within my organization?



How can I turn the challenges identified in the study into opportunities? What resources are necessary to make these potential opportunities into reality?



Who do I need to team with to assist the further emergence of quality?



Emergence



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FOR MORE INFORMATION, VISIT
asq.org/about-asq/how-we-do/futures-study.html.

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