I. Introduction

ASQ has a proud history of providing important science and technology to address difficult problems and challenges for organizations around the world. In the 1940s, ASQ stepped onto the scene with statistical tools to control product quality, and has evolved the body of knowledge to include standards, process improvement, product design, total quality management, and performance excellence. The methods and tools developed by ASQ members over the past six decades have helped control and improve quality across a vast range of industries and geographies. However, today senior leaders desire rapid and breakthrough innovation to remain competitive and address complex organizational, social, and environmental issues.

ASQ is at a pivotal juncture to further evolve the body of knowledge to include the science of innovation that defines the quality of tomorrow. Therefore, the ASQ board of directors commissioned the development of an innovation whitepaper to help ASQ identify the key inputs for developing an innovation framework of knowledge, methods, and tools. As a first step to create a baseline of perspectives, a diverse group of leaders was assembled to create an Innovation Think Tank (ITT). The points of view provided by the ITT were captured in graphical illustrations such as the one on p. 3. Upon completion of the Innovation Think Tank session, member leaders from the Innovation Interest Group developed narratives for the illustrations and provided additional perspective. The key themes identified by the Innovation Think Tank provide an important framework of critical questions and success factors that ASQ will need to consider in developing a credible and viable solution for the innovation challenge.

John Timmerman, Ph.D.
Chairman of the Board of Directors, ASQ 2013
II. The Innovation Landscape

ASQ has a critical role in both demystifying and codifying innovation. Innovation is a natural evolution from quality management and has been termed “Quality for Tomorrow” or, in other words, meeting the needs of tomorrow’s customer. Over the last decade the “e-suite” has moved innovation to the top of the agenda. Overwhelming evidence shows the most innovative companies are the most profitable (IBM CEO Survey 2006), and that to succeed, one has to take a strategic view of the marketplace. Within ASQ we have to discard the view that innovation is the province of R&D, just as 20 years ago we discarded the thinking that quality was only the province of the quality department. We must ask ourselves—just as we went through the agony of changing from ASQC to ASQ—whether in the future we will become global and innovative, and become the Global Society for Quality and Innovation!
### III. Overview of Innovation and Quality

Half a century ago, Peter Drucker made the point that innovation is the only true differentiator in the marketplace. Looking at the evolution of quality thinking over the last half century, innovation is in fact a natural outcome of quality thinking, although innovation sometimes involves behaviors and thinking that run counter to some practices in quality. The intense military activity of World War II laid the seeds of today’s quality profession. The need to control manufactured products and materials led to quality control (QC). In the following years this evolved into quality assurance (QA), as it was realized that preventing problems was cheaper than correcting them. The oil crisis of the 1970s led to the focus on quality management, and the knowledge developed in the ’70s and ’80s started to be codified in the ’80s with the emergence of ISO 9000 and excellence models such as the Baldrige Criteria for Performance Excellence.

Twenty-first-century technology has enabled companies to deliver quality more consistently and more easily. Focus has therefore shifted to marketplace differentiation through better service and support. This has, in turn, led to differentiation of the offering to the customer through radically new or innovative solutions. Quality’s historical emphasis on “reducing variation” must now be adapted to “introducing variation” to meet the diverse challenges faced by customers and users.

The customer is ultimately the driver of innovation, not the scientist, engineer, or designer. Business has focused on the importance of “agreeing requirements” with the customer; and the quality profession has focused on ensuring those requirements are met. This is flawed market strategy. There may be unmet customer needs that were not included in the “agreed customer requirements.” This leaves us open to the competitor who finds these needs and fulfills them. The innovator finds unmet customer needs, and then finds radical solutions to those unmet needs and ideally solutions that are hard for the competition to copy.
IV. Basic Elements of Innovation

New and unmet needs arise continuously in the marketplace. Unmet needs sit there because nobody has yet found a way to fulfill them. Throughout history there have been surges in knowledge that led to rapid solutions for these unmet needs. Surges in knowledge spawned the Renaissance of the Middle Ages, the inventors of the early 1900s, and the innovators of today. The inventors of the 1900s introduced aviation, photographers, and the combustion engine. Today, our revolution is in big part due to digitization. All of this change can be unexpected; and change leads to more change.

Radical solutions to new and unmet needs often result from creative approaches to problem solving, which can be counterintuitive to the quality professional who is usually analytical by nature. We are starting to understand creativity far more. We have learned to give ourselves “thinking space” and not push our minds to the limit. Archimedes had his eureka moment when he took a bath. Great ideas often occur when we are doing other things, but unfortunately we do not always respect “thinking space.” We must also allow external sensory experience to draw our past memories into the present. Those external experiences can be physical and intellectual, which is why we have found collaboration and group diversity a vital ingredient for generating new ideas.

Willingness to fail is also an important frame of mind for the innovator. WD40 (Water Deterrent #40) celebrates 39 previous failures. Innovators in our organization need to be encouraged and recognized. Thomas Edison famously said “genius is 1 percent inspiration and 99 percent perspiration.” When the new idea finally comes through as a new offering, it will not be immediately embraced—there will be a discomfort. Niccolò Machiavelli said, “He who innovates will have for his enemies those who are well off under the existing order of things.” All of this understanding is starting to come together, and as it does, we see the knowledge and understanding of innovation being solidified and codified. The first national and international standards of innovation process have been and are being developed.
V. Types of Innovation

The codification of innovation has led to a number of adjectives and adverbs being attached to the word innovation. We hear of disruptive innovation and open innovation to name just two. Although a consensus definition of innovation is elusive, it is clear that the various adjectives and adverbs serve a purpose. Organizations will define innovation based on their specific needs and strategic positioning, with standard terminology likely to develop over time. An important challenge for the quality profession is to understand the similarities, differences, and overlap between innovation and improvement.

For the quality professional, the simplest grouping of innovation is of the type we are used to: system-, process-, and product-level innovation. Applying this to the financial sector, for example, we see innovation at a system level through changes in banking models such as the Indian women’s bank MDMSB, a unique cooperative bank run by and for women. At a process level, getting cash through an ATM was incredibly innovative 40 years ago when this was first possible. More recently, product innovation came in the form of the sub-prime mortgage, and this reminds us that ordinary people do need to be protected from the unscrupulous innovator.
VI. Measuring Innovation

Innovation Think Tank participants generally agreed that a series of steps makes up the innovation experience and, though it may sound contradictory, innovation must be planned in order to allow serendipity. A good change management system is a trait of the learning organization, and an environment of constant learning is also inherent in innovation. Organizations often aren’t designed to take on innovation, however, and there is a need to redesign them to be innovative. Once a structure and well-balanced model is established, it must be followed. The challenge is to balance the right amount of structure, because too much process and structure can become counteractive to an environment of innovation. Given their long history of process and change management expertise, traditional quality professionals may ask of the innovator, “You want to do what?” and resist the addition of innovation to the Quality Body of Knowledge and the ASQ mix.

Viewed as a process to be managed, it is evident that innovation requires measurement. In the words of one participant, “Innovation in and of itself doesn’t really require measurement, but successful implementation or management of product development might.” Metrics for managing all types of innovation—including products, processes, and business models—as well as measures for the knowledge exchange that is the basis for innovation are needed.

Some examples are:

- Stage gate
- Speed to market
- ROI
- Resource yield
- Design iterations
- Knowledge transfer

Risk measurement is important as well, as risk is not only inherent in innovation but is a constantly changing factor. Understanding the risks will help manage the innovation process and improve success rates. Radical innovations carry greater risk and put the organization in a more vulnerable spot; the rewards can be great, but managing these risks is important to realize those rewards. Another part of innovation risk management is understanding that not innovating (i.e., status quo) also has inherent risks. These may be much greater than the risks associated with innovation. For example, some people don’t recognize the inherent risks associated with the apparent safety of a conservative savings account and are surprised by the inflation risk that can wipe out the value of the money in the account.
VII. Creating a Culture of Innovation

Similar to the concept of Little Quality and Big Quality (Little Q and Big Q), innovation can be channeled to a specific product or service (Little I) or be deployed for innovating the organizational structure or business model (Big I). Most organizational innovation is characterized as Little I because it is channeled through a special project, stage gate, or R&D process. The implementation of Big I requires a broader and more holistic framework that aligns the organizational strategy through the leadership system and is supported by a platform of resources and systematic processes.

ASQ conducted a quantitative study to identify the most critical success factors for enabling innovation across an organization. From a response of 1,486 ASQ Senior and Fellow members, culture received the highest response, with 86 percent of respondents selecting this as the key factor (see rank order of responses below). Senior leadership support received the second highest frequency of response (85 percent), followed by capabilities (81 percent), process (65 percent), and strategy (63 percent).

1. Culture (employee attitudes and participation)
2. Senior leadership support (advocacy for risk/long-term results)
3. Capabilities (workforce talent, training, and experience)
4. Process (effective methods and tools)
5. Strategy (alignment to profitable growth and business goals)

Similarly and unprompted, Innovation Think Tank participants cited the importance of these factors for driving organizational innovation. Culture, senior leadership support, and human capabilities can be viewed as the software, whereas process and strategy represent the hardware for Big I.
VIII. The Innovator’s Persona

The innovator asks of customers and potential customers, “Where do you have difficulty?” This is an early step in collaborating with customers. Another aspect is that innovators make themselves known and available to customers by putting themselves “out there.” This is as much for the customers to see and approach the innovator as it is for the innovator to approach customers. It also helps build a level of trust, which is essential for truly effective collaboration. Effective networking and collaboration, within the internal team and with external partners and customers, helps to avoid tunnel vision, increase the numbers of ideas, and identify alternate approaches and other considerations that might have been missed otherwise.

There are a number of ways to collaborate, but they generally fall into two main categories: face to face and virtual. Face-to-face collaboration is low tech and limited to the people in the room. There is generally a high volume of input, i.e., additional discussion, when people are able to receive complete communication and interact directly. Nonverbal cues can be read and assessed to help elicit input from quiet participants. Virtual collaboration is often an asynchronous activity and can involve more people, thus there is a potential for more diversity. With virtual collaboration, however, input is often narrower in scope because of limitations in the medium used.

A quality management system is designed for creating efficiency, and compliance systems encourage linear thinking, i.e., “Either it is compliant or it isn’t.” Innovation needs more than this. The innovative system needs to be ambidextrous, supporting both the creative and execution phases of the innovation process. Successful innovation requires both creative and execution phases to be equally necessary.

The cultures and belief systems of people involved in the system also need to be understood so their various perspectives can be addressed. For example, those who do not see a need to innovate—those who live by the adage, “If it ain’t broke, don’t fix it”—must not be ignored. They must be there to raise challenges. As with any other collaborative environment, those involved in the process need to clearly understand each other’s perspective.

In the creative phase, the vast majority of time should focus on discovery rather than design. Participants need this time to gain a true understanding of the issues, gain the users’ and other stakeholders’ perspectives, connect the dots, and make leaps in thinking. Design thinking, improvisation, and other techniques will encourage creativity.

In addition to focusing on discovery, the creative phase also requires that risk be viewed as not only acceptable but necessary. Risk aversion will strangle the innovation process. “Unlearning” is often required to develop the proper atmosphere of not just risk tolerance, but to encourage risk taking.

The creative phase may result in currently unviable solutions, but this result should be encouraged. Although the original idea may not have worked, it may lead to innovation in other unexpected areas—the original idea may provide insight into an area where a solution has been vexing.
The ideas generated during the creative phase need to be balanced with what the organization already knows to ensure staying in touch with the customers’ wants and needs as well as the organization’s own capabilities. The premature introduction of technical inputs stifles the creative process by limiting ideas to what can be done currently. The creative process is not open-ended; a clear end-state needs to be agreed on by the participants.

When it’s time to select a solution for development, technical inputs become necessary as they have bearing on estimating costs associated with development and production. The potential solutions need to be defined just enough to “put meat on the bone” for a proof of concept.

Once that state is reached, and the idea is selected, the pace changes. New thoughts and ideas are the beginning of innovation, but those ideas have little or no value if they aren’t developed and delivered to the marketplace. A sense of urgency and support for rapid development take over.

The customer, who should have been part of the collaboration through this point, should be excited—and impatient—by the prospect of the solution. Rapid development of a solution the customer can use easily becomes the main focus through the production and delivery phase of innovation.

Innovation team members need to be “T-shaped,” meaning they are experts in their field and their role, but have a broad understanding of the rest of the team, including the customer. Innovation is dependent on external organizational communication as a key source of ideas and opportunities for the process. The more information coming into the organization about challenges and difficulties in the market, the more diverse the potential solutions may be.
IX. Eight Critical Skills of the Innovator

What does it take to be a good innovator? Discussions of Innovation Think Tank participants highlighted eight critical skills:

1. A good innovator not only has a deep understanding of the innovation process, but he or she is capable of explaining the process to new team members when they arrive.

2. A good innovator is able to create a “genius team” by identifying the strengths of each team member and fitting them into the best roles to support the team. Finding a good fit for team members strengthens the team in two ways: the more closely matched team members are to the roles they perform, the higher percentage of overall performance the team is able to realize; and team members participate more fully once they realize how their innate abilities improve the results of their roles.

3. A good innovator is able to clearly define a problem without proposing a solution in the definition. A simple example of the difference is, “We need to install Microsoft Word,” as opposed to, “We need a way to work on documents in an easily editable format that is capable of being read by all of our customers.” The solutions may be the same, but the first version directs that solution as opposed to identifying the problem.

4. A good innovator understands that creativity can be innate or learned. Even people who feel they are not creative can learn how to think creatively through training and use of the appropriate tools. Oftentimes though, even the innately creative person also needs training—of a different type—to understand the overall process, where their skills fit, what other members of the team bring, etc.

5. A good innovator needs to be highly skilled at collaboration and management. The innovator’s collaboration skills do not just apply to being able to perform the act, they apply to helping others participate effectively as well. Innovative teams are often diverse—having cultural diversity and managing it for the best overall outcome is very helpful to the innovator. More diversity, however, can mean more conflict. The good innovator is able to discern between conflict that challenges the team to reach higher and conflict that eats away at team cohesiveness, and react accordingly.

6. A good innovator is able to use tools such as social media to effectively communicate a value proposition. By addressing the market in the most suitable way, the good innovator demonstrates an understanding of the customers’ needs.

7. A good innovator has an entrepreneurial mindset, and is skilled at the art of getting an idea into the market. This is more than just understanding the innovation process, it also involves understanding the opportunities of the market, how to communicate with potential customers, and how to introduce solutions in a way that excites the customer base.

8. A good innovator is capable of inductive, deductive, and abductive thinking. While deductive reasoning is needed for activities like root cause analysis, it doesn’t embrace the realm of possibilities that inductive and, especially, abductive approaches present. Inductive and abductive reasoning are most valuable to the innovator in helping identify a future state, i.e., “Here is a possible cause for why something happened—let’s find a solution and make it real!”
X. How Should ASQ Get Started?

Innovation Think Tank participants shared a strong belief that it is important for ASQ to further examine the subject of innovation. However, given the constraint of information and time, it was challenging for Innovation Think Tank participants to develop a recommended course of action. ITT participants directionally felt that ASQ can play a key role as a convener for innovation with its body of knowledge and nearly 80,000 members. There was also general consensus that ASQ first needs to establish credibility. Innovation Think Tank participants provided the following suggestions:

- Create an Innovation BoK and certification.
- Continue to engage thought leaders.
- Cultivate an innovation community model.
- Provide additional definitions, methods, knowledge, and whitepapers for innovation.
- Member leaders, including the board of directors, should provide support and resourcing.
- Develop an innovation institute.
- Engage in conferencing and journal articles.
- Build a communication strategy.

Innovation Think Tank participants offered their ongoing support and ended the session with a mantra of, “Don’t allow members who are satisfied with the current state set the direction for the future!”

To learn about ASQ’s Innovation Interest Group, please go to their website at asq.org/innovation-group. Reference materials relative to innovation can be found at http://bit.ly/InnovationCommunity.