Organize How You INNOVATE

ISO 9004:2009 **provides the structure** to innovate more effectively

by Natalia Scriabina

In 50 Words Or Less

- Innovation is not an art, but a process that receives inputs from monitoring and analyzing an organization's environment.
- ISO 9004:2009 provides a systematic, process-based approach to innovation within a quality management system.
- This approach can help organizations innovate more effectively.

IT IS DIFFICULT to underestimate the role of innovation in the success of an organization. *ISO 9004:2009—Managing for the sustained success of an organization* redefines the role of improvements and innovations within a quality management system (QMS) through their connections with management of knowledge, information, technology and learning processes.

Using ISO 9004:2009 is a valid approach to innovation and improvement processes, but it's important to know the differences between innovations and improvements, and understand the key sources and methods to innovate. It also helps define innovation as a process, measure it and incorporate innovation processes into the management system.

Innovation and execution

An organization needs to be effective in the areas of innovation and execution to be continuously successful. There also needs to be the right balance between these two concepts that seem to contradict each other.

The idea of execution suggests efficiency, predictability and consistency. It resonates with meeting quality, schedule and cost commitments.

Innovation, on the other hand, is about creativity, inventiveness, developing new products, making the existing products more compelling to customers and reaching new types of customers. Innovation also implies streamlining product development, manufacturing and supply chain processes to deliver products to market with increasing levels of efficiency, speed and quality.

By its nature, execution must be mistake proof and flawless, and it must follow a proven path. To ensure the execution steps are consistent and free of mistakes, they should be clearly defined, documented and measured. Errors identified in past executions should be analyzed, and actions to prevent their recurrence should be taken.

Root cause analysis, statistical process control and process description are the most commonly used tools to support effective execution. On the other hand, the essence of innovation is searching, probing and making mistakes. A typical innovation toolset includes brainstorming, prototyping and experimenting.

"Part of anything innovative, especially in the pharmaceutical industry, is that a lot of what you do fails," Howard Rosen, the former president Alza Corp., a pharmaceutical and medical systems company based in Mountain View, CA, told *Fortune* magazine in 2003. "What you want to do is fail fast and cheaply."[1]

As you can see, there doesn't seem to be overlap between innovation and execution goals or among approaches to achieve these goals. A question that many companies have asked in the face of increased competition and unstable economical environment is: "How effectively can we organize and balance innovation and execution that in most cases could blend together no better that oil and water?"

To answer this question, let's review the most widespread approaches used to the generate innovative ideas.

Inside, outside and outsource

Innovative ideas can either be purchased in the form of licenses and other agreements with third parties or generated within an organization. Some companies, such as Microsoft and Google, invest significantly in R&D processes—in the range of 15-18% of their revenues.[2,3] They believe that producing innovative ideas internally gives them the freedom to:

- Maintain closer technical control of their products and processes.
- Define priorities for modifications and enhancements as appropriate.
- Select the most suitable timelines for implementation of innovations.[4]

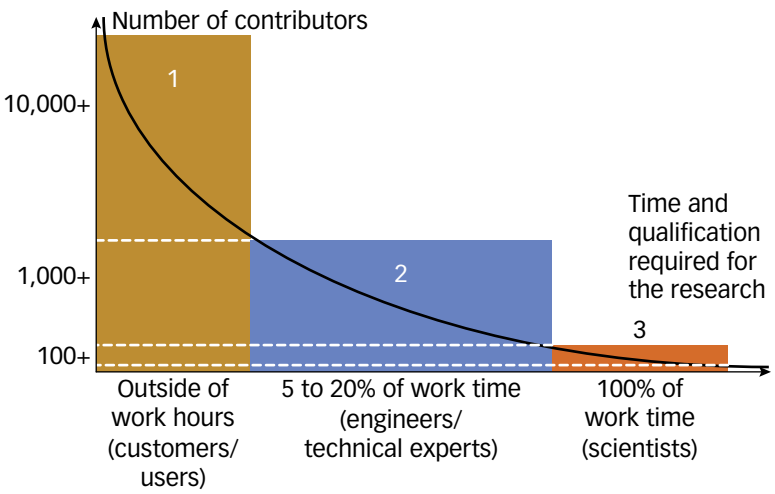
Internal innovation processes can use ideas generated inside a company by participants—ranging from a tiny number of researchers to a companywide group of contributors. Innovative ideas also can be generated outside of the company by interested parties such as customers, partners, suppliers and end users.

Generally speaking, the bigger the group of contributors, the less qualification and time to conduct research is required from the participants, as shown in Figure 1.

Sector one in Figure 1 resonates with the "crowdsourcing" idea introduced by Jeff Howe in 2006.[5] Crowdsourcing is a way to involve a large group of the

Time to innovate / FIGURE 1

Correlation between the group of research contributors and the time and qualification required for the research per individual



interested public, including customers, in innovation processes based primarily on e-collaboration.

Examples of online tools the general public can use to submit innovative ideas to specific organizations include BMW Virtual Innovation Agency, My Starbucks Idea, Dell's IdeaStorm, Shell's GameChanger and Procter & Gamble's Connect + Develop.

Google Product Idea was launched in January 2009. Some 20 months later, the portal had helped collect more than 14,000 ideas from nearly 44,000 contributors for just one product: Google Mobile.

NASA's Stardust@Home research project includes thousands of volunteers from around the world collaboratively looking for the first pristine interstellar dust particles ever brought to Earth.[6]

Instead of taking years, e-collaboration accelerated the innovation process to just a few months. Procter & Gamble claims more than 50% of its product initiatives involve significant collaboration with outside innovators.[7]

Sector two in Figure 1 represents a smaller group of more qualified people dedicated to R&D, including engineers, product managers and designers employed by the company or its suppliers and partners.

IBM provides a good example of a software platform that facilitates collaboration for innovation. Since 2006, IBM has used Innovation Jam—online brainstorming sessions—internally. By 2010, it helped to generate innovative ideas for 10 new IBM businesses.

R&D conducted by engineers requires extra time, and some leading companies allocate up to 20% of engineers' working hours for these activities. For example, for one day a week, engineers at Google are encouraged to focus on research to generate innovative ideas of their own. It's known as the 20% rule,and it has helped launch successful Google products such as Google News, Google cloud computing, RechargeIT and AdSense.[8]

Sector three in Figure 1 illustrates the most traditional source of innovative ideas and includes scientists and professional researchers. These people are expected to dedicate 100% of their work time to R&D activities.

Microsoft Research is one of the best examples of this approach. It employs more than 800 researchers, including some of the world's finest scientists working in different locations throughout the world.[9] The areas of research range from down-to-earth tasks such as enhanced information coding to more fundamental areas such as artificial intelligence.

As these examples show, leading corporations demonstrate no attempts to blend innovation with execution. Innovation can be generated from pure research activities (Microsoft Research), during the engineers' time allocated to research (Google's 20% rule) or through mass collaboration activities (NASA's Stardust@Home).

Innovation is **not a mystery,** but rather a **mastery of gathering new information** continuously.

Innovation within a system

After reviewing the key inputs to innovation processes, the next step is to review the role of innovation within a QMS. ISO 9004:2009[10] is one of the first international standards to define guidelines for innovation processes and the first one to apply innovation to a QMS.

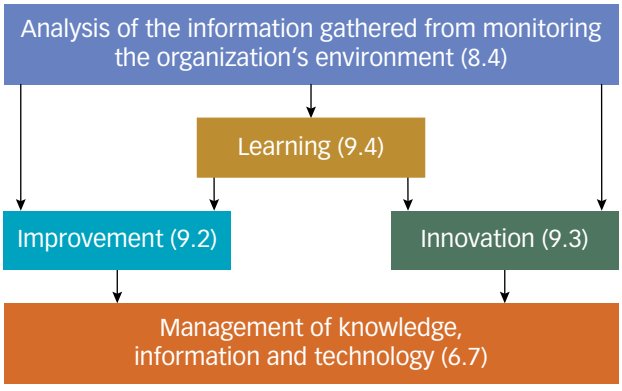
ISO 9004:2009 provides guidance on the implementation of a systematic process-based approach to innovation. This approach is substantially different from the traditional one in which innovation is the result of the collective creativity of individuals.

The processes of innovation, research and development were traditionally connected to the processes of product realization covered by clause 7 of *ISO 9001:2008—Quality management systems—requirements*. The new ISO 9004:2009 suggests a broader application of improvements and innovations, including not only products, but also technology, processes, management systems, and the constitution and structure of an organization.

The previous version of ISO 9004:2000 gives guidance on promoting, encouraging and supporting creativity and innovation from people. Various clauses of ISO 9004:2009, however, connect the innovation process with other business processes in the organization, shown in Figure 2 (p. 20).

If innovation is treated as a process within a system, it uses inputs gathered from the monitoring of the external environment collected through the system

Innovation processes connected to other ISO 9004:2009 processes / FIGURE 2



and produces results that will be maintained within the system of knowledge, information and technology management.

Innovation, improvement and learning

ISO 9004:2009 suggests that innovation—as well as improvement and learning—are based on analyses of data and information. Innovation, improvement and learning processes all overlap one another.

Learning implies acknowledgement of information and data for future reference. Improvement is a practical use of information and data to develop better solutions. Innovation takes it a step further in using information and data to produce new solutions.

As defined by clause 9.1 of ISO 9004:2009, improvement applies to something that already exists (for example, current products and processes) while innovation implies development of something new (for example, new products and processes).[11] In some instances, it may be difficult to clearly distinguish the results of improvements and innovations.

When new features and functionalities are continually added to a product, for example, it might be difficult to identify a point at which the improved product becomes a new version of itself. The same applies to improvement of processes, methods, documents and other subjects of improvement and innovation.

Improvements are traditionally divided into two categories:

- Small-step improvements.
- Breakthrough improvements.[12]

The scope of improvements is always within the current paradigm. The small-step improvement solution may be apparent (for example, color coding to prevent human errors). Breakthrough improvements may require gathering and analysis of data (for example, process reengineering to eliminate waste and redundant activities).

Innovation can be considered as a next step after improvement and can be divided into three generic types:

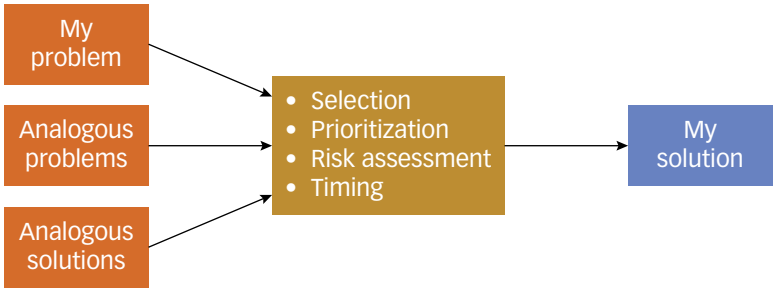
- Incremental innovation (for example, a new version of software with upgraded functionalities).
- Radical innovation (for example, touch-screen phones that don't completely replace keyboard phones but appeal to a large segment of the market).
- Disruptive innovation (for example, cable TV has made home TV antennas nearly irrelevant).[13]

The scope of innovation is outside of the current paradigm and targets new products, solutions or functionalities. Innovation often requires large volumes of data and application of scientific knowledge.

Table 1 shows the difference between approaches to the planning and management of improvement and innovation processes. Table 1 also demonstrates that deployment of innovation processes is quite different from the deployment of improvement processes and requires at least:

- Resources allocated to innovation activities (for example, Google's 20% rule).
- Tools for research and analysis (for example, e-collaboration via IBM Innovation Jam).
- Priority-based identification of target areas (Microsoft Research's list of projects).

Example of process flow for innovation activities / FIGURE 3



Defining and measuring

Just like any other processes within a business system, innovation processes are connected to other processes and are expected to be robust, mistake proof and predictable. With that in mind, certain information should be taken into account when planning and managing processes of research, development and innovation:

Process flow: Creative ideas cannot be taken out of the context of the organization's environment. Innovations should be driven by the organization's environment and its current—and especially anticipated—changes. For example, innovations need to be aligned with the changing patterns of consumer behavior, expectations of society and upcoming technology trends.

Monitoring, analysis and learning not only help to identify trends and establish priorities for innovation processes, but they also help to capture lessons learned and best practices that can inspire innovative solutions.

Organizational learning, as defined by ISO 9004:2009, includes "collecting information from various internal and external events and sources, including success stories and failures, and gaining insights through in-depth analyses of the information that has been collected."[14]

Results of innovation and improvement processes should be protected and maintained through the application of knowledge and information management processes.

The innovation process, in many cases, includes:

- Finding an application for a new solution and good practice that becomes available.
- Making mistake-proof solutions based on the lessons-learned information.
- Selecting existent solutions analogous to the problem that needs to be resolved.

Figure 3 shows an example of inputs, outputs and steps of innovation processes.

Measuring innovations: The innovation process—as any other process—should be measured and monitored. Several sources of information can help to create meaningful criteria to apply to this process:

The World Economic Forum's Innovation Pillar of Competitiveness. Since 2005, the World Economic Forum has produced a competitiveness analysis using the Global Competitiveness Index (GCI), and it publishes the results in the annual *Global Competitiveness Report*.[15]

The GCI captures the microeconomic and macroeconomic foundations of national competitiveness based on 12 pillars of competitiveness. One of the pillars is called the innovation pillar, and it has a set of criteria that can apply not only to national economies, but also to businesses.[16]

Table 2 summarizes the innovation pillar criteria tailored to the level of organizations. The innovation pillar criteria can help evaluate the capabilities of an organization to innovate, as well as find gaps and opportunities to enhance such capabilities.

The Globe Forum's Sustainability Innovation Award. Another set of metrics that applies to innovation processes and their outcomes is defined in the criteria for the Globe Award, an initiative developed by the Globe Forum.[17]

The award is given in several categories, including sustainability innovation. An organization's

Innovation vs. improvement / TABLE 1

What?	Innovation	Improvement
When?	Preplanned time	Continual process
Who?	Dedicated resource	Everyone in the organization
How?	Research and risk assessment	Quality tools and methods
Where?	Selected processes and areas	All processes and areas
Why?	To gain competitive edge	To avoid losses

Innovation pillar of competitiveness criteria / TABLE 2

Criteria	Key question	Grades (1 to 7)
Capacity for innovation	How does your company obtain technology?	1 = Exclusively from licensing 7 = By conducting research
Quality of research	How would you assess the quality of research?	1 = Very poor 7 = The best in their field
R&D spending	To what extent does your company spend on R&D?	1 = Does not spend on R&D 7 = Spends heavily on R&D
Collaboration with universities	To what extent does your company collaborate with universities on R&D?	1 = Does not collaborate at all 7 = Collaborates extensively
Availability of scientists and engineers	To what extent are scientists and engineers available in your company?	1 = None 7 = Widely available
Utility patents	How many utility patents does your company have?	1 = None 7 = Objectives or benchmarking data

Source: Klaus Schwab, *The Global Competitiveness Report 2009-2010,* The World Economic Forum, 2009.

Globe Award criteria for sustainability innovation / TABLE 3

Prime	Is it a genuine innovation?
Prosperity	Is it economically viable?
People	Is it socially viable?
Planet	Is it ecologically viable?
Perpetual	Is it renewable into perpetuity?
Principle	Is it ethically viable?

Source: www.globeaward.org/about-globe-award

sustainability innovation evaluation is based on the six criteria listed in Table 3. Sustainability innovation criteria are focused on ensuring the outcomes of innovation processes are focused on achieving short and long-term business goals.

Systematic approach

Innovation is not an art, but rather a process that receives an input from the monitoring and analysis of an organization's environment. Innovation processes are connected to learning, continual improvements and other processes within a QMS.

Internal innovation processes can use ideas generated inside an organization by a group of people ranging from a tiny group of researchers to a companywide board of contributors. Innovative ideas also can be generated outside the company by interested parties such as customers, partners, suppliers and end users.

ISO 9004:2009 is an international standard that defines guidelines for a systematic process-based approach to innovation within a QMS. The standard embraces innovation and learning, along with continual improvement processes, as key elements of the continual development of an organization.

The difference between improvement and innovation is subtle. ISO 9004:2009 suggests a broad application of improvements and innovations, including not only products, but also technology, processes, management systems, and the constitution and organizational structure of an organization.

Innovation processes can be supported by several tools that help to generate, validate and select innovative ideas, and prepare those ideas for commercial deployment. There are several sources of information that can help create meaningful criteria to measure the innovation process, including the Sustainability Innovation Award and the Innovation Pillar of Competitiveness.

To be continuously successful, an organization needs to acknowledge that innovation is not a mystery, but rather a mastery of gathering new information continuously, applying it quickly to generate new ideas and probing the ideas to select the best ones based on customers' needs and priorities.

To really advance in the mastery of innovation, an organization needs to take advantage of new information technologies and analytical tools that can make this process fast, reliable, repeatable and robust. QP

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