

BUSINESS EXCELLENCE SOLUTIONS



A Comprehensive Approach to Quality Aims at Inclusive Growth

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International Academy for Quality

The Future of Quality: Aiming at Inclusive Growth

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Abstract

At its first statement the concept of continuous improvement was established as a fundamental management principle by the French mining executive Henri Fayol (*General and Industrial Management*, 1916). This presentation describes the evolution of continuous improvement into a global quality movement; presents key ingredients of a comprehensive global definition of quality; and identifies future challenges based upon the concept of inclusive growth as an outcome of quality governance requirement for diversity and transparency. Three models related to continuous improvement are presented: process of management; quality delivery process and organizational learning process. Continuous improvement encompasses the need for continuous innovation. Diversity and transparency support innovation management which drives broad economic growth and assures the increased quality of life for mankind, rather than a narrow economic development which sacrifices quality as a means to exploit the Earth's resources to the detriment of mankind's sustainability. As a way to bridge into future quality, a "learning" methodology is presented where each participant must become both a teacher and a learner. The need for cross-cultural quality learning is highlighted in a "triple loop" model of organizational learning that describes the different levels of engagement that must occur in any social system that is addressing the critical problems faced by mankind. This model provides a framework for understanding the social implications of quality and is a vital component in the development of an inclusive model that engages all of mankind in the management of growth. The challenges for practical implementation of this model are presented along with a proposed role for the United Nations.

Keywords

Process of management, continuous improvement, quality, innovation, systems engineering, business models, Total Quality Management (TQM), ISO9000, business excellence, Lean Six Sigma (LSS), breakthrough management

Introduction

The concept of continuous improvement was defined as a fundamental management principle by Henri Fayol in 1916. Since then continuous improvement has evolved into a global quality movement that has embraced all types of enterprises and all work disciplines. The movement is sometimes called a “total quality” approach as a way to signal the need for inclusiveness for engaging all people from all levels of all organizations in a common purpose or aim – increasing the quality of life for all people in all areas of their lives. This paper presents a comprehensive general definition of quality and illustrates how organizations can establish a learning approach to develop in an inclusive manner to stimulate organizational quality growth toward excellence. Quality management integrates innovation and collectively they drive broad economic growth and assure increased quality of life for mankind. Let us begin by considering the motivation for continuous innovation as a driver of sustainable success.

Motivation for Continuous Innovation

Organizational leaders are faced with two simultaneous trends:

- **First Trend:** Customers always want more performance and expectations tend to rise and markets develop to maturity; therefore increased capability is required from organizations.
- **Second Trend:** Processes degrade in performance over time due to depreciation and the natural effect of entropy; therefore processes tend to decrease in capability to perform.

Capability to produce an outcome is based upon a judgment by recipients of that outcome (customers) as a comparison in effectiveness of an organization as a ration of their expectation for results to be produced compared to the performance of the organization’s process of managing to produce those results. The gap between these initial expectations and achieved performance gives rise to a continuous need for improving the processes of management.

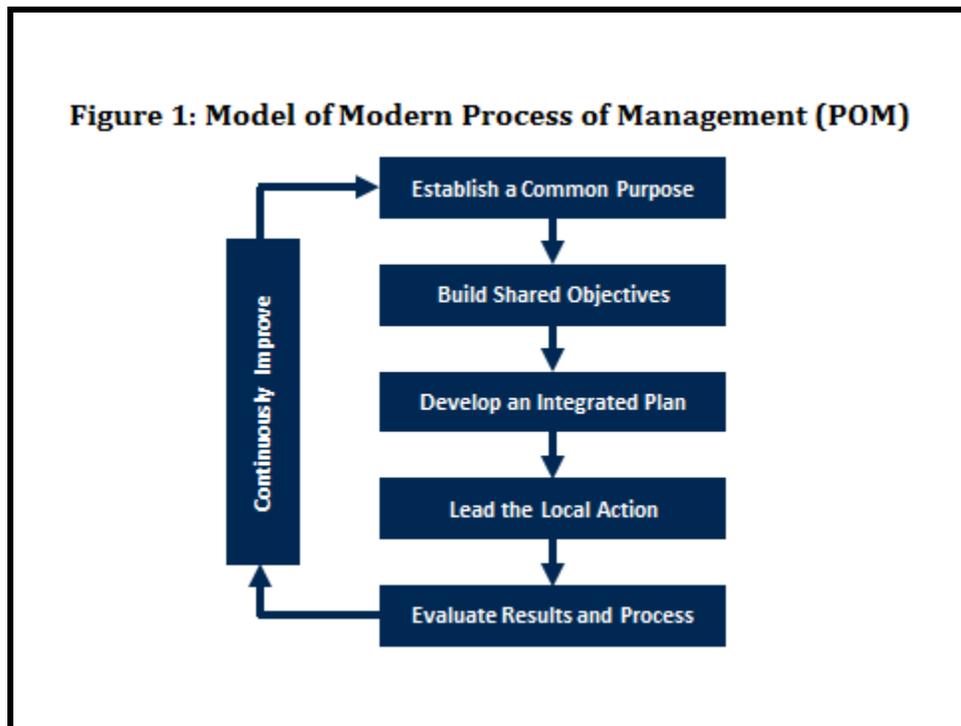
In 1916, Henry Fayol (1841-1925) wrote *General and Industrial Management* which espoused the idea of a fundamental management principle of continuous improvement. Fayol described the process of management as a series of activities: planning, organizing, coordinating commanding, and controlling. He believed that good management requires “a constant search for improvements that can be introduced into every sphere of activity” and that “the search for improvements should be pursued unceasingly at all levels and throughout all parts of the business. The executive in charge should have an active, unrelenting intention to effect improvements.” Fayol’s text laid the foundation for the role of the modern executive just as the *Principles of Scientific Management* by Frederick Winslow Taylor (1911) had established guidelines for the analytical understanding of work processes. In his book Taylor had proclaimed that “the system must be first;” but in practice he worked only the bottom half of the system, just as Fayol focused on the top-down perspective. However, it is the interplay between the daily work and the strategic direction where many organizations fail in integrating their objectives. To work in practice requires an understanding of the theory.

Russell L. Ackoff wrote (*The Art of Problem Solving*, 1978): “Successful problem solving requires finding the right solution to the right problem. We fail more often because we solve the wrong problem than we get the wrong solution to the right problem.” Fayol did establish the need for looking at business in different perspectives: “forecasts are not prophecies: their function is simply to minimize the factors as much as possible.” Thus, managers have attempted to build various models of organizations and structures without reaching consensus on what is really important. We would do well to heed the advice of the eminent statistician George E. P. Box: “all models are wrong, some models are useful. Every model is an approximation – it is the data that is real (they actually happened!). Don’t fall in love with a model. The model is a hypothetical conjecture that might or might not summarize and or explain important features of the data” (*Statistics for Experimenters*, second edition, 2005).

From this discussion, we should conclude: first, the process of management must be based on a requirement for continual improvement that engages the entire workforce (both directions are essential – top down and bottom up). Second, whatever model is developed to describe the way an organization works must address work as a system and be simple enough to explain how work is done and profound enough to be valuable. Such a model should begin with the process of management that engages the various organizational levels in producing its output.

The Process of Management

Figure 1 is a modern model of management developed in the mid-1980s at Hewlett-Packard:



This model was developed using action research into the practices of the leading mid-level HP managers and aligned to a general model for continuous improvement that was developed in Japan (the Plan, Do, Check, Act or PDCA model which is often called the Deming cycle, although the model was actually developed by Shigeru Mizuno based on his interpretation of W. Edward Deming's early lectures in Japan). Perhaps the most innovative aspect of this HP model is its separation of a process of working (the process of management) from the content of this work (what flows through this generic process or the organization's daily management activities).

So, we can apply this model as the process for managing continuous improvement in all areas of work. The next question is: if this is an approach for managing processes by quality (means of a quality process), then how is the quality content of products or services developed (the ends of a quality process)? To answer this question we must formally define the term quality and identify the boundary conditions for its scope or application.

What is quality?

Quality may be defined as the attribute or set of attributes that describe essential ingredients of an actual entity or the experiences by which we judge its value or relative worth. Quality is also the means by which we assure that these attributes are capable to satisfy our expectations for such value. So, quality can refer to the product attributes or the service experience, as well as the techniques by which the level of performance for these attributes or experiences are assured. Thus, these two aspects of quality describe both an end in itself as well as the means to achieve that end. In the first case, quality is an indicator of an achieved outcome, while in the second case it is a set of philosophies, methodologies, and engagement practices that have proven capable to deliver quality outcomes.

Continuous improvement includes both an emphasis on shorter-term change management as well as longer-term strategic change. Such change may be either evolutionary or incremental improvement to work methods, or it may be revolutionary or transformation that results in a breakthrough discovery of a totally new way of working. When we define the scope of quality, it must include both categories of continuous improvement as well as an approach to standards that hold performance gains in between the cycles of improvement. Additionally, it is necessary to include a review or monitoring process that is capable of detecting changes in performance or process activity that indicates a loss of capability and the quality system must be capable of correcting such problem deviations and also preventing the occurrence of any known potential deviations. Thus, quality methods provide a means to deliver quality performance results in the end product or service.

How is quality distinguished from excellence? Excellence is a milestone on the quality journey; it is the end result of having built an effective quality system (for doing quality) and engaging people in actions that create a quality mindset (converting the work attitude or motivation into being quality).

Quality is composed of the attribute or set of attributes, by which an actual entity or experience is judged to deliver value to its recipient. The actual entity is the deliverable of an organization (e.g., product or service) while the experience is the perceived level of service that is detected

by the recipient (who may be called a client, constituent, beneficiary, guest, or customer). Thus, quality is both an end (an outcome) of human effort using a systems approach, as well as the means to achieve this end (the components of the system: philosophy, methods, and process or procedures). The most common methods considered for developing quality are standards (ISO9000 is perhaps the most popular); self-assessment (here business excellence models provide a means to check on the maturity of the quality development process); or a management approach for driving the critical strategic quality improvement projects (problem-solving projects (using the Six Sigma DMAIC method) or new design approaches to innovation (using the Six Sigma DMADV method) which results in establishment of a control mechanism using the quality standard (e.g., an ISO9000 procedure).

Thus, **comprehensive quality** is achieved through an integrated approach to “**doing quality**” by people who are united in their intent upon “**being quality**” and energetically developing a quality mindset that is aligned with the personal and cultural values which define a common approach to their way of working. Because quality depends on people, quality systems become stronger as the inclusion of individuals in active roles within the quality system becomes more inclusive. Continuous learning requires that organizations must move from a “commitment to the principles of quality” to an “engagement in the practices of quality” to the “involvement in development of quality.”

Why does quality matter?

In a world of scarce resources we must not squander the value that is implicit in them. We must pay attention to how we use our time (scope and span of attention or our degree of involvement) as well as our finances (the money that we invest to obtain value from objects or experiences). Thus, we cannot afford a loss of quality either personally or on behalf of our society and mankind (depending upon the perspective from which we form our judgment regarding quality). Quality is an essential ingredient in the human experience as mankind seeks to assure quality of life in all of its perceivable dimensions. Quality is an imperative to sustain life as we know it. Without quality our World will suffer from entropy and mankind will make a poor use of its resources in the blind pursuit of economic development without creating what is necessary for sustainability of the quality of life as we know it today.

How do we assess quality?

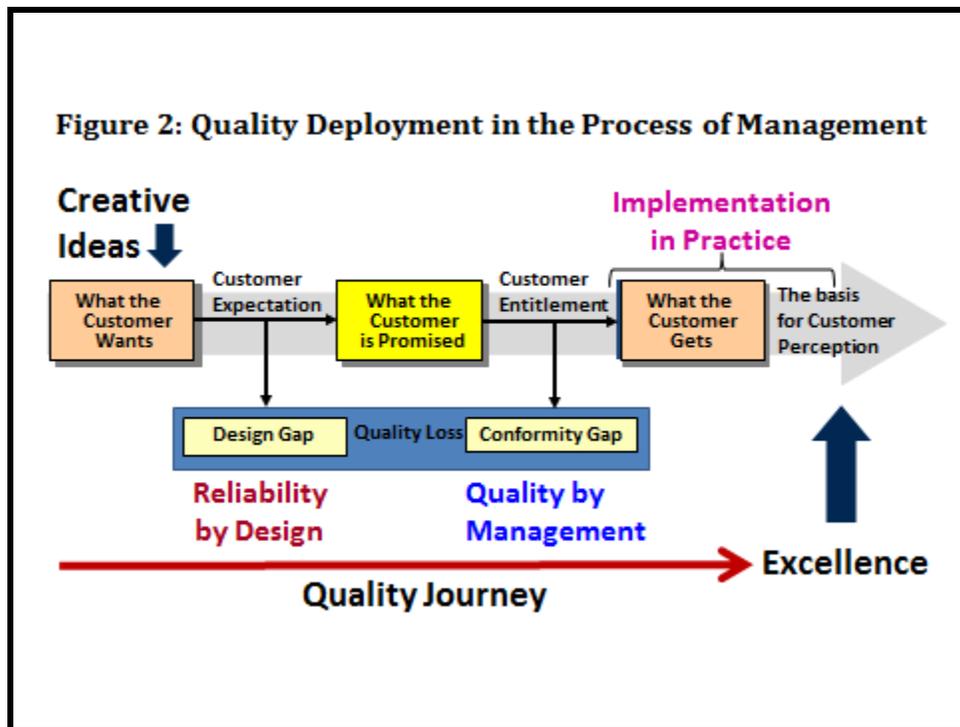
What are the dimensions by which we formulate judgments about quality? ¹ In 1987, Harvard Professor David Garvin created a definition of quality that illustrated eight distinct dimensions of quality which serve as a framework to concentrate judgments regarding attributes for quality: performance, features, reliability, conformance, durability, serviceability, aesthetics, and perceived quality. The interactions among these various quality attributes represent a spectrum of strategic opportunities for organizations to differentiate themselves and their products or services from competing alternatives. However, the customer makes choices based upon the attractiveness of the relative quality propositions that are put forward by competing

¹ David A. Garvin, “Competing on the Eight Dimensions of Quality,” *Harvard Business Review*, November-December 1987, pp. 101-109.

organizations. Thus quality judgments are always made relative to a perceived need as well as with respect to alternatives for satisfying such needs. Quality judgments are made based on strong cross-cultural considerations where value is determined relative to the perceiver. It is important to note that achievement of quality outcomes often requires the blending of several cross-discipline quality technologies (e.g. reliability engineering, auditing, statistical analysis, and measurement technology). Thus, the discipline of quality sciences possesses several aspects that must be integrated into a well-designed systems approach to achieve consistent outcomes on behalf of the customers or constituents who make the judgment regarding the adequacy of attractiveness in the quality (or the lack of attractive quality).

How do we distinguish quality from Excellence?

The development of attractive quality (as defined using the model of Noriaki Kano)² follows the process described in Figure 2 for quality deployment in the process of management.



Quality must be expressly embedded into the daily experience of managing an organization in both dimensions of designing the quality “actual entity” (product) or “experience” (service). It is a three step process which delivers quality to the beneficiary and evaluator of its value. As is shown above the steps are: determine what the customer wants; develop a promise of results or outcome generated; and deliver the outcome. This is summarized in this model in the following way:

- **What the customer wants:** this process develops an imaginative understanding of a quality

² Noriaki Kano, Nobuhiku Seraku, Fumio Takahaashi, and Shinichi Tsuji, “Attractive Quality and Must Be Quality,” *Proceedings of the 12th Annual Meeting of the Japan Society for Quality Control (JSQC)*, 1982.

deliverable (either actual entity or experience) based on an investigation of attributes of the deliverable that will meet the customer's performance expectation. Three levels of quality expectation should be addressed: first, compliance quality for basic or foundational needs that are judged relative to a standard for performance; second, the competitive quality of attributes that must exceed the value proposition of alternative choices that are available to the customer; and third, attractive quality attributes that provide unanticipated delight to the customer through the development of an innovative capability. However, innovations of this type are dynamic and have a half-life of degradation to the competitive level as free market conditions cause competitors to duplicate functionality and the advantage of being the prime mover for developing a novel feature or functional attribute becomes nullified in time. In this activity, any gap in quality is a loss caused by design and the methodology that is able to address such losses is reliability engineering (typically as embedded in the Six Sigma DMADV process). Not all customer expectations must be met as the organization has to evaluate its commercial goals against the ability to engineer a product that will satisfy the critical requirements of its customers.

- **What the customer is promised:** The design process is completed by making a performance promise to customers that defines what they should expect to achieve in the performance envelope of the product or service attributes. The objective of promise-making is also to be promise-keeping. Thus, the objective of the promise should be flawless execution from the viewpoint of the customer (performance that is perceived to be so good it is flawless). The execution of the work (management of the daily work that delivers outcomes to customers) is evaluated by the third step in the quality delivery process.
- **What the customer gets:** People learn about quality by observation of the performance of an "actual entity" or "experience" that they receive. Thus, customer perception is based on an assessment of what they get. If customers perceive that the design is insufficient or that a product or service does not live up to its performance promise (the expectation that has been set in the promise), then they would judge a product or service as lacking in quality. In making such a value judgment, there are two different new aspects of failure: (1) problems that develop in the management of the process of realizing the service before delivery to a customer, and (2) problems that develop in the customer's implementation or experience in using the product or executing the service. In either case, shortfalls from the promise will be properly evaluated as a "lack of quality" by the customer.

Since this process develops content of products and services using the process of management, it will result in continuous improvement and refinement of products and services as they seek to increase the alignment of its "value proposition" that best fits their customer's expectations. In achieving this alignment the front-end of the process must develop an imaginative way of seeing the customer application or "job that needs to be done" as articulated by Harvard Professor Clayton M. Christensen (*The Innovator's Solution*, 2003). Thus creative ideas drive the quality delivery process and as the cycles of improvement continue, this process is actually a journey that delivers excellence: value that customers use and appreciate. Thus, it is possible to conclude: excellence is a milestone on the quality journey. As customers intensify their requirements and set higher expectations, the required level of excellence will also increase.

Learning About the Content of Quality

The modern development of the concept of quality is at an anniversary in 2011: a century after the publication of Taylor's work which commenced the modern documentation of man's search for quality. Over the past 100 years, the focus on quality has changed. Initially it was a focus on making manufactured products to specification and the focus of quality was on standardization, measurement, acceptance testing, quality inspection, and quality control. As learning increased the focus shifted to control mechanisms for process adjustment to assess products in process of production and assure that they will meet specifications; thus, evolved learning that established a discipline of quality engineering. Quality assurance came next as organizations recognized a need to align engineering specifications to contracted customer requirements. As the need grew for inclusion of all employees in the process of continuous improvement thus total quality management was borne. Today's emphasis on comprehensive quality recognizes the need to integrate quality across the entire business system (including extensions to the supply chain and distribution channels) and to expand the scope to a global system. Reliability is quality that lasts – a capacity excellence that is designed to endure. Today, business leaders must build a process of management that establishes a reliability organization – an organization whose set of promises have merit and customers are confident in the organization's ability to deliver on these promises. Continuous innovation and reliable development must both be included in the modern version of continuous improvement. Excellence is result of habit – the habit comes from doing the right things in the right way which is the consequence of thinking and doing quality. Thus, quality matures into a pervasive mindset that prevails in individuals, teams and organizations and quality thinking motivates action to apply principles, methods and tools of quality sciences to deliver "right work outcomes" as judged by external organization customers.

Innovation is Explicitly Integrated into the Process of Management through Quality Delivery

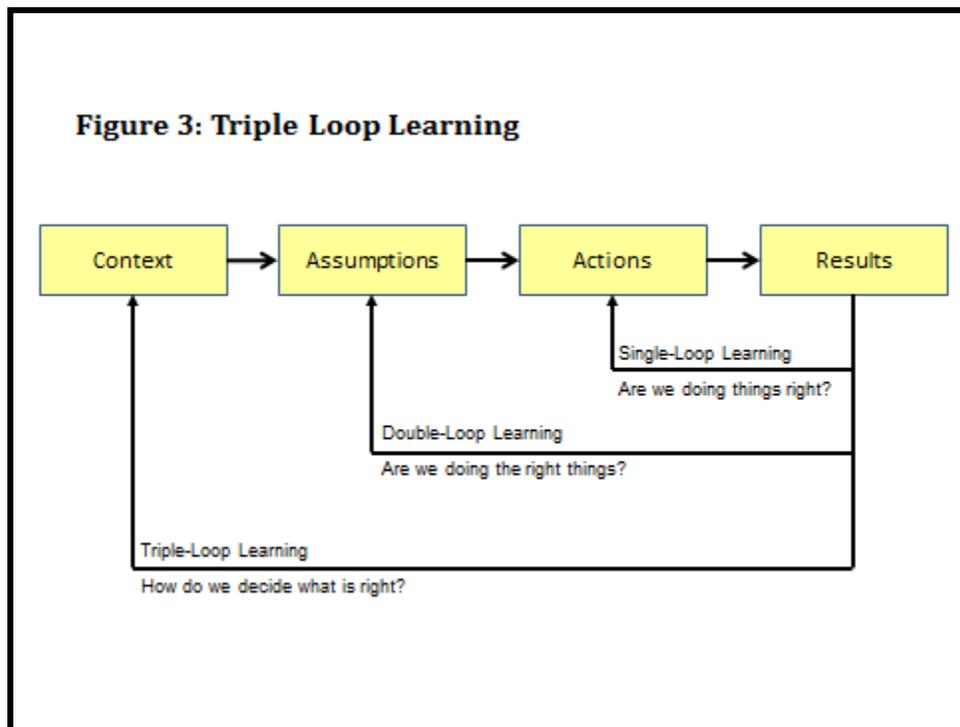
The process of innovation is integrated within the process of management through the quality delivery process. However, to understand what this means we must set some fundamental definitions for these closely related concepts:

- **Creativity:** generation of imaginative ideas without regard to practicality or ability and ease of implementation; success is measured only by the number of new ideas. Creativity refers to the act of producing new ideas, approaches or actions.
- **Invention:** the imaginative discover of ideas that define a potentially practical new device, composition, gadget, or process that did not exist previously. Inventions may be derived from pre-existing works, or they may be independently conceived (a radical breakthrough).
- **Innovation:** ideas applied in practice; the entire process by which an organization generates creative new ideas and converts them into novel, useful and viable commercial products,

services, and business practices. Thus, while creativity is the generation of novel ideas which is a necessary step within the innovation process, innovation is the process of both generating and applying creative ideas in some specific context. Author Max McKeown commented that innovation is “a new way of doing something or new stuff that is made useful” (*The Truth about Innovation*, 2008).

- **Engineering:** designing and implementing useful features and functions at the lowest total cost (including the cost of failure).

Thus, innovation is an aspect of continuous improvement in both its incremental form (such as evolutionary improvement) and in its breakthrough form (or revolutionary improvement). It is by innovation that an organization assures that the quality features of its products and services are developed into attractive quality where its perceived value exceeds that of alternative choices that are available to customers. Thus, quality incorporates innovation as a component of its core delivery process, just as it is inclusive of problem-solving and management of daily routine work. How can an organization consciously develop such an express approach to embedding quality? Organizations must learn to take positive action as the development of quality is not a natural act. The means to sustain quality originate from a quality mindset that is learned from experience. The process to create the best quality system for any organization is called “triple loop learning” (see Figure 3).³



³ Chris Argyris and Donald A. Schon, *Organizational Learning: A Theory of Action Perspective*, (San Francisco: Addison-Wesley, 1978).

The First Loop: Managing Continuous Improvement

Harvard psychologist Chris Argyus defined “single loop learning” as the analysis of results to evaluate actions (or methods) and answer the question: are we doing things right? This focus on the content or outcomes of process actions provides for “detection and correction of errors” or solving the immediate problem and seeks to learn how to do things consistently right. At this level we engage the daily work practices and operate the quality management system. Some aspects of “single loop learning” are:

- Document the current standard work process.
- Instill discipline of work process measurement.
- Assure quality review of work outcomes or products.
- Implement corrections to assure standard results.
- Design preventive action to eliminate future problems.
- Change the standard work definition to assure quality.

Single Loop Learning applies to all process workers at all levels of an organization and it focuses on daily work process execution using work standardization, process improvement and problem-solving methods. Single loop learning devises an integrated system of work processes in order to eliminate waste and defects in all processes (commonly used quality methods include: ISO9000, Lean production methods, and the Lean Six Sigma DMAIC process). This first loop of learning is the realm of quality control, quality engineering and quality assurance while quality management rules in the second loop of learning.

The Second Loop: Engineering the Quality Management System

“Double-loop learning” occurs by ‘questioning the system of learning’ resulting in correction of underlying principles, assumptions theories, and policies of the organization or implementing insights for change that were identified in the detection and correction process. This learning process focuses on the question: “are we doing the right things?”

At this level we design of the business system and engineer the quality management system for assuring the preservation of a continuous improvement process. Common tasks related to this cycle of learning include:

- Developing a standard problem-solving process.
- Developing a standard process mapping and analysis method.
- Developing a standard performance measurement and reporting system.
- Developing a standard for risk and failure analysis method.
- Developing a standard performance measurement system.
- Developing a standard processes for change management.

Activities in this second learning loop are driven by the organization's professional staff of specialists in business process improvement and quality management and focus on cycles of learning how to apply the first learning loop better by developing and improving on standard ways of working through a structured review process (quarterly, bi-annually, or annually). This review process gathers input that is distributed across the organization as well as from external partners (suppliers and distributors) and centralizes the understanding of what, where and how to improve by reviewing lessons learned, best practices as well as the results of failed project activities in an effort to increase the effectiveness of process and project performance.

The Third Loop: Transformation Management

The third learning loop is a leadership effort rather than a management effort. It is directed at the adaptation of the organization to its changing context – the external environment in which it must operate to remain effective. At this level the organization is transformed by learning what needs to be different in its operating system: how does the organization decide to do what is right? “Triple Loop Learning” is about learning what the organization needs to learn or learning how to learn differently. This type of learning provides the basis for permanent change in the way people work at the institutional or cultural level and is the realm of leadership which has the organizational power to mandate new directions and align resources to reshape the way an organization operates through evolution of its genetic code or DNA.

Activities in the third learning loop are part of the work of the executive management team as facilitated by its change managers or chief quality professional. The focus of this work is on developing an organizational process for change management as well as determining the context in which new content should be orchestrated into the organization's management system. This process should be concentrated in a self-assessment of the organization's maturity in development of its business systems that is conducted annually as a prelude to its strategic planning. The objective should be to identify strategic change projects that reshape the organization's process capability to achieve its strategic intent. In the language of the Six Sigma methods, this is called the “Recognize” step which generates either DMAIC or DMADV improvement projects. In a Japanese “Hoshin Kanri” system, this represents the culmination of the “catchball” process that specifies the Hoshin objectives to be achieved by the organization's alignment of its efforts.

Thus, single loop learning occurs during problem-solving of work processes while double-loop learning occurs during management review of improvement projects by integrating lessons into the organization. Triple loop learning occurs through reflective review of change management efforts and scanning the organizations environment and by identifying what new insights occur that bring new knowledge for adaptation into the organization's culture.

The Quality Mindset

In order for an organization to “unconsciously act” to achieve quality outcomes for its critical performance attributes, it must first become “consciously competent” in its way of working by

creating a quality mindset or an inclusive way of thinking about its belief system or culture that demonstrates a pervasive attitude of quality through a set of behaviors that include:

- Collaboration and cooperation showing respect for individuals
- Clear communication – with intent to clarify (fair, equitable, even-handed treatment)
- Ethics, honesty, integrity of information (our words are authentic and say what we mean)
- Etiquette and respect for behavioral norms
- Broad systems perspective
- Transparency, openness to consider options and alternatives regarding issues and concerns

In summary, an organization that that promotes inclusiveness through attention to this set of behaviors will demonstrate flexibility and moderation by promoting group harmony through the rationalization of work and alignment of objectives. The core capability of such behavior is the adaptiveness that is essential for survival of the fittest – or sustainability of organizations.

On the other hand, organizations that fail to develop a quality mindset develop what may be called “core rigidity” – an inflexibility that is derived from a deficit in the quality mindset. This is characterized by an opposite set of behaviors that signal rigidity and extremism:⁴

- Divisive, aggressive behavior demonstrating disrespect for individuals
- Prejudiced communication with an intent to obscure (unfair, inequitable, biased treatment)
- Extreme positions, fueled with inaccurate information, and purposeful misinterpretations
- Disrespect for behavioral norms – attacking others
- Narrow, single-purposed perspectives
- Vague, opaque, closed viewpoints and positions on issues and concerns

Avoidance of such rigidity requires a structured learning process as mankind tends to become comfortable with old ways of working and must challenge itself through the application of a structured learning process (such as triple-loop learning) to assure that its capacity to innovate and continuously improve is not limited. Continuous innovation requires that organizations overcome the inertia of the status quo through the design and execution of purposeful change.

Result: Inclusive Growth

Inclusive quality requires that all of us must examine our motivations and our actions. Are we congruent – are our words consistent with our deeds? Is our mindset characteristic of quality? Do we have constancy of purpose? Confucius (Kong Qiu (551-479 BC)) said: “What you know you know; what you don’t know you don’t know. Wisdom is: knowing what you know and what you don’t know.” Inclusiveness takes us back to the process of management: a need to develop common purpose and shared objectives – integrating our actions so we can advance our way of working to continuously improve. Without such inclusiveness organizations won’t grow, but

⁴ Dorothy Leonard-Barton, “Core Capabilities and Core Rigidities: A Paradox in Managing New Product Development,” *Strategic Management Journal*, 1992, Vol. 13, No. 5, pp. 111-125.

will suffer from internal conflict and be characterized by lack of cooperation. Only when all of our informal organizations display the same quality mindset as advocated by the formal culture will true collaboration become possible. Thus, to be better we must learn; to do better, we must act.

Future Challenge

As quality becomes better understood, this way of thinking must expand beyond our individual organizations, to embrace both national and global systems. These models define a framework for understanding the social implications of quality as a critical component in development of an inclusive model that engages all of mankind in the management of growth. The challenges for practical implementation can only be coordinated on a global basis through the activities of the United Nations. Developing the UN into a global forum for quality of life for mankind is the most daunting challenge facing the community of those who share the values and beliefs of this quality way of thinking and living. This is the challenge of our century.

Summary

This paper has developed a number of important themes:

- Definition of quality using value-based attributes
- Fundamental management concept of continuous improvement
- Generic process of management
- Quality delivery process
- Organizational learning process
- Shared mindset as the key to quality inclusiveness
- The requirement for a global approach to quality development

We need to rethink our approach to quality, not seeking new and different ways to “invent” what we mean by quality, but to build on the important wisdom that has been developed in the past and to refine our approach through cycles of continuous improvement.

Galileo Galilei (1564-1642) said:

“All truths are easy to understand once they are discovered; the point is to discover them.”

“You cannot teach a man anything, you can only help him to find it within himself.”

Isaac Newton (1642-1727) said:

“If I have seen further, it is by standing on the shoulders of giants.”

Author:

Gregory H. Watson is Chairman of the International Academy for Quality. He is a past-President and Fellow of the American Society for Quality and a Fellow of the Institute for Industrial Engineers. He holds advanced degrees in engineering, law and management is a registered European Engineer (EUIng) in both systems and industrial engineering. Mr. Watson is also Chairman of Business Excellence Solutions, Ltd., a Finland-based management consulting company and has previously held executive positions with Xerox Corporation, Compaq Computer Corporation and the Hewlett-Packard Company. He is the author of ten books. ***Strategic Benchmarking*** (John Wiley, 1993) was chosen by Fortune Magazine as a Book-of-the-Month selection and was named by Library Journal as one of the 12 best business books of 1993. Among the awards he has received, Mr. Watson is the first non-Japanese recipient of the Deming Medal from the Union of Japanese Scientists and Engineers. He is also a recipient of the Distinguished Service Medal from the American Society for Quality, the Magnolia Quality Contribution Award from the Shanghai Association for Quality, and the Gold Medal of the Finnish Society for Quality.



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Aiming at Inclusive Growth**

31 October 2011
Shanghai, China

Gregory H. Watson, Chairman, International Academy for Quality

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Abstract:

The principal of continuous improvement was established as a fundamental component in general and industrial management by Henri Fayol in 1916. This presentation: describes the evolution of continuous improvement into a global quality movement; presents key ingredients of a comprehensive global definition of quality; and identifies future challenges based upon the concept of inclusive growth as an outcome of quality governance requirement for diversity and transparency. Diversity and transparency support innovation management which drives broad economic growth and assures the increased quality of life for mankind, rather than a narrow economic development which sacrifices quality as a means to exploit the Earth's resources to the detriment of mankind's sustainability. As an approach to the future of quality, a "learning" methodology will be presented where each participant must become both a teacher and a learner. The need for cross-cultural quality learning is highlighted and a "triple loop" model of organizational learning is presented that describes three different levels of engagement of the social system in addressing the critical problems faced by mankind. This model provides a framework for understanding the social implications of quality as a critical component in development of an inclusive model that engages all of mankind in the management of growth. The challenges for practical implementation of this model are presented along with a proposed role for the United Nations.

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Motivation for continuous innovation:

Leaders are faced with two simultaneous trends:

First Trend

Increased capability required!

Second Trend

Decreased capability delivered!

Increased capability required!

- Customers want more performance and expectations tend to rise due to economic and market development
- Processes tend to degrade in level of performance due to depreciation and the natural effect of entropy.

Decreased capability delivered!

TODAY

$$\text{Capability} = \frac{\text{Results Expectation}}{\text{Process Performance}}$$

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Henri Fayol: Father of Continuous Improvement



Henri Fayol (1841-1925)

General and Industrial Management (1916)

“The process of management is planning, organizing, coordinating, commanding, and controlling.”

Management requires ... “a constant search for improvements that can be introduced into every sphere of activity.”

“The search for improvements should be pursued unceasingly at all levels and throughout all parts of the business. The executive in charge should have an active, unrelenting intention to effect improvements.”

Work in harmony!

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To master reality, we must understand theory:

“Successful problem solving requires **finding the right solution to the right problem**. We fail more often because we solve the wrong problem than because we get the wrong solution to the right problem.”

Russell L. Ackoff, *The Art of Problem Solving*, 1978

“**Forecasts are not prophecies**: their function is simply to **minimize the unknown factors** as much as possible.”

Henri Fayol, *General and Industrial Management*, 1916

“**All models are wrong, some models are useful**. Every model is an approximation – it is the data that is real (they actually happened!). **Don’t fall in love with a model**. The model is a hypothetical conjecture that might or might not summarize and/or explain important features of the data.”

George E. P. Box, *Statistics for Experimenters*, second edition, 2005

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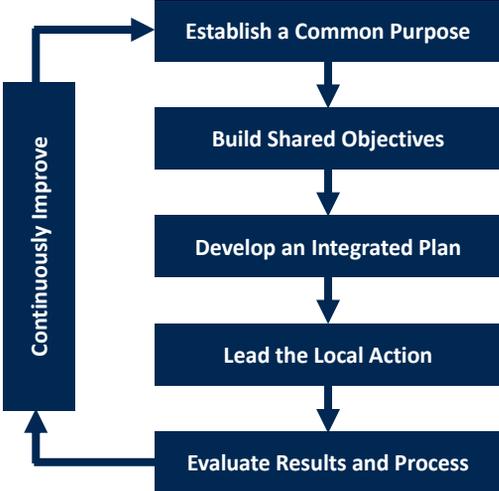


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Model of Modern Process of Management (POM)

Quality must not be thought of as distinct from a process of management. It must be embedded throughout each activity within that process!

Inclusive quality!



```

graph TD
    A[Establish a Common Purpose] --> B[Build Shared Objectives]
    B --> C[Develop an Integrated Plan]
    C --> D[Lead the Local Action]
    D --> E[Evaluate Results and Process]
    E --> A
    subgraph Improve
    direction TB
    I[Continuously Improve]
    end
    I --- A
    I --- E
  
```

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Evolution: CI transitions into global quality

- Quality through standardization = quality specification.
- Quality through acceptance testing = quality inspection.
- Quality through measurement feedback = quality control.
- Quality through process adjustment = quality engineering.
- Quality through customer alignment = quality assurance.
- Quality through employee engagement = total quality.
- Quality through business system design = quality integration.
- Quality through supply chain alignment = global quality

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Excellence is a milestone on the quality journey!

What is “Quality”? How does quality differ from “Excellence”?

Excellence is result of habit – the habit comes from doing the right things in the right way which is the consequence of thinking and doing quality.

Quality matures into a mindset that prevails in individuals, teams and organizations and thinking quality motivates action to apply the principles, methods and tools of quality sciences to deliver “right work outcomes” as judged by the customers of the organization. **Quality includes everyone!**

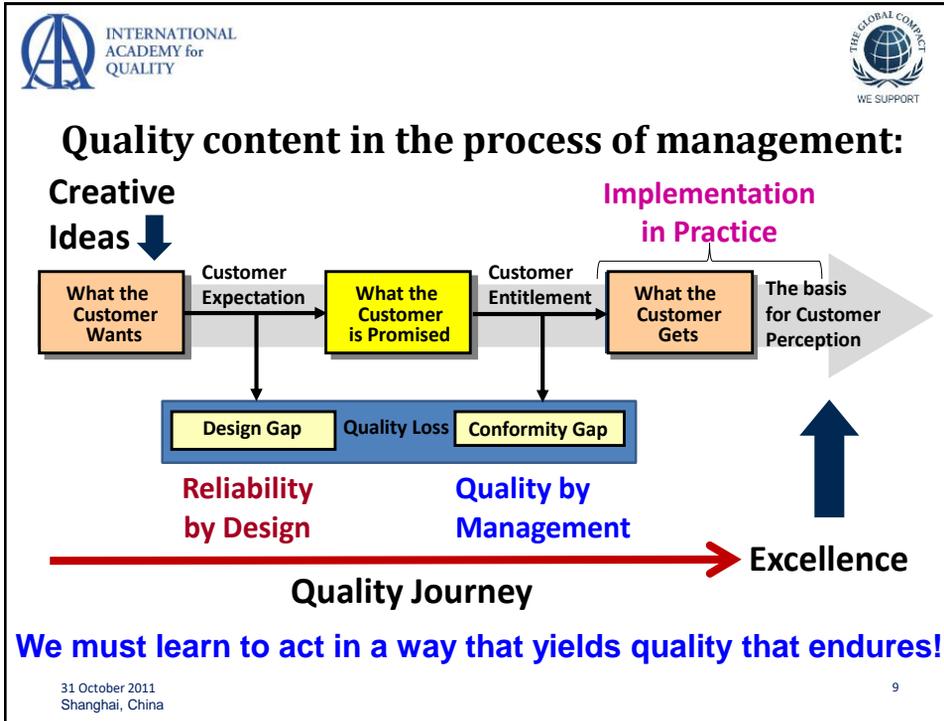
How does quality differ from “Reliability”?

Reliability is an ability to consistently deliver a useful level of excellence in quality of performance over a sustained period of time in the operational environment of the customer – it helps customers to get their jobs done. It is reliability, not over-exaggerated promises of great performance, is what matters most for generating long-term customer confidence. **Reliability is sustainable, quality that lasts – designed with a capacity to endure.**

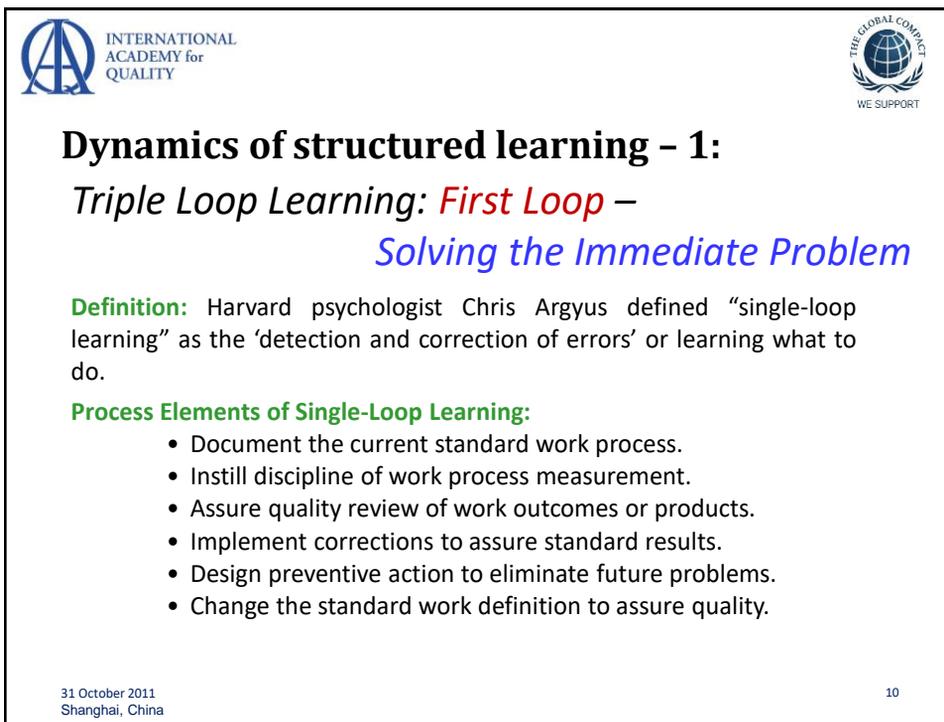
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Single loop learning process:

- **Who:** all process workers at all levels of organization.
- **What:** standardization, problem-solving and process improvement
- **When:** daily work process execution
- **Where:** an integrated system applying to all work processes
- **How:** work standards, problem-solving methods and continuous process improvement methods (e.g., ISO9000, Lean, LSS DMAIC)
- **How much:** eliminate waste and defects in all processes.



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Dynamics of structured learning – 2:

*Triple Loop Learning: **Second Loop** – The Improvement Process*

Definition: “Double-loop learning” occurs by ‘questioning the system of learning’ resulting in correction of underlying principles, theories, policies of the organization or implementing insights for change that were identified in the detection and correction process.

Process Elements of Double-Loop Learning:

- Developing a standard problem-solving process.
- Developing a standard for risk and failure analysis.
- Developing a standard performance measurement system.
- Developing a standard processes for change management.

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Double loop learning process:



- **Who:** professional staff for project business process management
- **What:** develop and improve standard for single-loop processes
- **When:** review regularly (quarterly, bi-annually, annually)
- **Where:** centralized function for standards; distributed for inputs
- **How:** reviewing lessons learned, best practice and failed projects
- **How much:** Strive to increase project performance effectiveness

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Dynamics of structured learning – 3:

*Triple Loop Learning: **Third Loop** – Charting Strategic Change*

Definition: “Triple-loop learning” – learning what we need to learn – learning how to learn differently – permanent learning that changes the way people work at the institutional or cultural level because the change masters have the power to mandate the new processes!

Process Elements of Triple-Loop Learning:

Thus, single loop learning occurs during problem-solving while double-loop learning occurs during management review of improvement projects by integrating lessons into the organization. Triple loop learning occurs through reflective review of change management efforts and by identifying insights into new knowledge for adaptation into the organization’s culture.

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Triple loop learning process:



- **Who:** executive management team supported by quality leaders
- **What:** focus on developing an organizational process for change
- **When:** review annually as a prelude to strategic planning
- **Where:** orchestrated management meeting
- **How:** self-assessment of maturity and identify projects to improve
- **How much:** Strive to permit process capability to achieve strategic intent

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Learning creates a quality mindset:

An attitude of quality is demonstrated in these behaviors:

- Collaboration and cooperation showing respect for individuals
- Clear communication – with intent to clarify (fair, equitable, even-handed treatment)
- Ethics, honesty, integrity of information (our words are authentic and say what we mean)
- Etiquette and respect for behavioral norms
- Broad systems perspective
- Transparency, openness to consider options and alternatives regarding issues and concerns
- **Summary: Flexibility and moderation**

Such inclusiveness promotes organizational harmony as well as rationalization of work and alignment of objectives.

Dorothy Leonard-Barton, "Core Capabilities and Core Rigidities: A Paradox in Managing New Product Development" *Strategic Management Journal*, 1992, Vo. 13, No. 5., pp. 111-125.

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Learning avoids a deficit in a Quality mindset:

Lack of quality is demonstrated in the opposite behaviors:

- Divisive, aggressive behavior demonstrating disrespect for individuals
- Prejudiced communication with an intent to obscure (unfair, inequitable, biased treatment)
- Extreme positions, fueled with inaccurate information, and purposeful misinterpretations
- Disrespect for behavioral norms – attacking others
- Narrow, single-purposed perspectives
- Vague, opaque, closed viewpoints and positions on issues and concerns
- **Summary: Rigidity and extremism**

Therefore, management needs a structured learning process to assure that its capacity to innovate is not limited.

Dorothy Leonard-Barton, "Core Capabilities and Core Rigidities: A Paradox in Managing New Product Development" *Strategic Management Journal*, 1992, Vo. 13, No. 5., pp. 111-125.

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To **be** better, we must **learn**... ... to **do** better we must **act**!



“What you know, you know; what you don’t know, you don’t know.”

~ Confucius

“Wisdom is knowing what you know and what you don’t know.”

~ Confucius

Inclusive quality means that all of us must examine our mindset (motivations) as well as our actions are we congruent – consistent in words and deeds? Do we have constancy of purpose?

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Gregory H. Watson, Chairman, International Academy for Quality

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Gregory H. Watson is Chairman of the International Academy for Quality. He is a past-President and Fellow of the American Society for Quality and a Fellow of the Institute for Industrial Engineers. He holds advanced degrees in engineering, law and management is a registered European Engineer (EUIng) in both systems and industrial engineering. Mr. Watson is also Chairman of Business Excellence Solutions, Ltd., a Finland-based management consulting company and has previously held executive positions with Xerox Corporation, Compaq Computer Corporation and the Hewlett-Packard Company. He is the author of ten books. *Strategic Benchmarking* (John Wiley, 1993) was chosen by Fortune Magazine as a Book-of-the-Month selection and was named by Library Journal as one of the 12 best business books of 1993. Among the awards he has received, Mr. Watson is the first non-Japanese recipient of the Deming Medal from the Union of Japanese Scientists and Engineers. He is also recipient of the Distinguished Service Medal from the American Society for Quality, the Magnolia Quality Contribution Award from the Shanghai Association for Quality and the Gold Medal of the Finnish Society for Quality.

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IAQ Forum:

Challenges for Inclusive Growth

Moderator:

Gregory H. Watson
Chairman International Academy for Quality

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Cooperation is a key ingredient in effective management.

Total quality management has sought to engage everyone, at all levels in organizations in the continual improvement of performance for the good of the entire organization.

When the principle of "total quality" is extended to all of society, then we encounter challenges to achieve "inclusive growth" for individuals and nations.

The IAQ Forum will present different perspectives on this topic of inclusive growth with particular emphasis on new or emerging challenges that mankind will face.

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<u>Speaker:</u>	<u>Topic:</u>
<p>Janak MEHTA Way KUO Yoshinori IIZUKA Charles A. AUBREY Pal MOLNAR H. James HARRINGTON Juhani ANTTILA Chao-Ton SU Yuri GUSAKOV Yuenzhang LIU</p>	<p>Primary Education Higher Education Healthcare Systems Pharmaceutical Access Agrifood Systems Commerce Technology Access Engineering Applications Standards Compliance Implications for China</p>

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Academician Janak Mehta, India

- **President of International Academy for Quality**
- **Past President, Asian Network for Quality**
- **Founding President, Indian Society for Quality**
- **Pioneer in contemporary Indian quality movement**
- **Chairman, TQM International**

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Academician Emeritus Way Kuo, Hong Kong

- **President, City University of Hong Kong**
- **Elected to the United States National Academy of Engineering**
- **Elected Foreign Member of Chinese Academy for Engineering**
- **Editor, IEEE Transactions on Reliability**
- **Author of seven books**

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Academician Yoshinori Iizuka, Japan

- **Professor, School of Engineering, University of Tokyo**
- **Vice President, International Academy for Quality**
- **Past-President, Japanese Society for Quality Control**
- **Recipient JUSE Deming Prize for Individuals**
- **Recipient ASQ Freund-Marquardt Medal**

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Academician Charles A. Aubrey, USA

- Member, Board of Trustees, International Academy for Quality
- Fellow and Past-President, American Society for Quality
- Chairman and Past-President, Asia-Pacific Quality Organization
- Recipient ASQ E. Jack Lancaster Medal
- Vice President, Quality and Performance Excellence, Anderson Pharmaceutical Manufacturing

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Academician Pal Molnar, Hungary

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- Past-President, European Organization for Quality
- Past-President Hungarian Society for Quality
- Recipient, IAQ Founders Medal
- Professor, Food Science and Quality, University of Szeged

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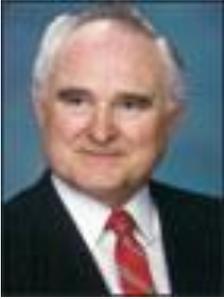
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Honorary Member H. James Harrington, USA

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- Fellow and Past-President, American Society for Quality
- Honorary Advisor, China Quality Control Association (since 1987)
- Distinguished Service Medal, American Society for Quality
- Chief Executive Officer, Harrington Institute

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Academician Juhani Anttila, Finland

- Member, Board of Trustees, International Academy for Quality
- Vice President for Quality, Sonera Corporation (retired)
- Honorary Member, Finnish Society for Quality
- Founders Medal, International Academy for Quality
- Yoshio Kondo Medal, International Academy for Quality

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Academician Chao-Ton Su, Taiwan

- Chair Professor, Industrial Engineering and Engineering Management, National Tsing Hua University
- Founder and Past-Chairman, Chinese Society for Six Sigma
- Individual Award, Taiwan National Quality Award
- Distinguished Research Award, National Science Council, Taiwan
- Author of three books.

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Academician Yury Gusakov, Russia

- Past-President, European Organization for Quality
- First Vice President, Russian Organization for Quality (ROQ)
- President, Russian Testing Organization (RTO)
- Academician, Russian Academy for Quality (RAQ)
- President, International Section for RAQ

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Academician Emeritus Yuenzhang Liu, China

- **First Chinese Member, International Academy for Quality**
- **Professor, Chinese Academy for Science**
- **Member, Chinese Academy of Engineering**
- **Dean, School of Management, Shanghai University**
- **Author of 20 books related to quality**

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Inclusion In Primary Education

- **Has greatest impact on inclusivity**
- **Is the primary driver empowering people**
- **To improve quality of life for all**
- **Thereby contributing in all fields of endeavor**
- **Quality in education as the greatest multiplier**

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Inclusion In Higher Education

Accountability

Research and Learning

Social Responsibility

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Healthcare as a Socio-Technology

Healthcare is a **"socio-technology"**

- **Socio-Technology:** A technology (reproducible method to achieve an objective) that is owned by the whole society
- Reflects the level of the society

Two types of technology:

- "Inherent Technology" and "Management Technology"

Forms of socio-technology:

- **Social common sense:** principles, basic model
- **Knowledge infrastructure:** establishment, availability, update
- **Implementation:** application in healthcare organizations

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Inclusion in Pharmaceutical Access

- **Pharmaceutical entry barriers to China**
- **Pharmaceutical regulation/enforcement**
- **Access to pharmaceutical industry jobs**
- **Access to pharmaceutical products/drugs/devices**
- **Utilization of pharmaceutical products/drugs/devices for better health outcomes**

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Inclusion in Agrifood Systems

- **Food Quality and Safety for Quality of Life**
- **Regulation and Standards to Ensure and Develop Food Quality and Safety**
- **The Importance of the Chain Approach**
- **The New "Quality Package" of the European Union**

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Inclusive Growth in Commerce

- Recent explosive growth has made China #1
- Focused on sales to foreign companies, not foreign consumers
- China's competitive advantage has been inexpensive labor
- Future growth must be in brands and mid-to-high-end products
- Establish its reputation in Asia and then the rest of the world.

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Inclusion in Technology Access

- **Challenging technologies**
 - ✓ Biotechnology
 - ✓ Nanotechnology
 - ✓ Infotechnology
- **Inclusive growth related to quality**
 - ✓ Products and processes: New challenges: problems and opportunities for individuals, organizations and societies
- **Example, Organizational processes**
 - ✓ Access to a new era in quality management and quality assurance

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Inclusive Growth through Engineering

- **Products can be designed and manufactured in various ways; we must select the most suitable one.**
- **Sustainable growth can be attained by quality Improvement and Innovation (QI²).**
- **Clone (Shanzhai) culture must be transformed by appropriate management and engineering methods.**
- **"Supply chain quality management" must become the key competitive advantage for China.**

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Inclusion through Standards Compliance

- **Standard and regulations improve quality require inclusive involvement as they apply to all society.**
- **Standards bring order and are important specifically for countries with mandatory standard systems.**
- **Standards development is the result of team efforts and it deliver technical innovation and common wisdom.**
- **Standard development is challenging activity and requires a cross-section of national and cultural participation.**

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Xie Xie!
Thank You!

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This multi-part series of articles addresses the history of the quality movement and its role in attaining inclusive growth for organizations begins by establishing the importance of continual improvement as a key management function.

A Comprehensive Approach to Quality Aims at Inclusive Growth

Continual Improvement as a Management Imperative

Gregory H. Watson

Over the past century, the quality movement has focused on operational issues. Initially, Frederick W. Taylor systematically investigated productivity, seeking to achieve “maximum prosperity for the employer coupled with the maximum prosperity for each employee.”¹ He set out to develop the “one best way” to do work by determining how long work should take and how it could be accomplished in the most effective way. Since that time, organizations have emphasized generating effectiveness by focusing on efficiency and associated practices that eliminate waste while increasing quality

and throughput. These approaches have been applied to production operations and more recently, to services as well.

This foundation had led quality management professionals to concentrate their efforts somewhat myopically on improving the way people work. The main thesis that the four articles in this series will develop is the need to shift the focus from this traditional view to a broader perspective where management emphasizes achievement of quality results. This is a much more comprehensive approach, encompassing all disciplines and methods that are used to improve performance. Quality



becomes one of the primary outcomes that management must attain to achieve profitable growth and excellence in its work endeavors. These articles, therefore, will position “comprehensive quality” as a principal objective of “inclusive growth,” an outcome of the cooperative efforts within an organization.

Total Quality Management

The historical focus on the concept of total quality management (TQM) might be considered sufficient for dealing with these same issues. TQM was initially described as Total Quality Control (TQC) by Armand V. (“Val”) Feigenbaum.² He presented quality as both the means and the result; management became the methodological process for applying those means and attaining the results.

Unfortunately, TQM never became part of the mainstream of the discipline of business management—despite the encouragement of many senior business leaders/influential quality gurus or approaches such as quality management systems, Lean Six Sigma methods, and performance excellence (e.g., the Malcolm Baldrige Award criteria). It was sidelined as a subset of production and operations management, as a technical issue for industrial engineers, applied statisticians, and Lean Six Sigma Black Belts, or as a standards compliance issue for quality assurance auditors.

If we are brutally honest, we must conclude that quality has fallen far short of universal acceptance as the critical ingredient in management thinking to stimulate growth. In fact, the best efforts of the quality community have tended to limit its integration into the domain of organizational management. Unwittingly, use of the term “quality management” has enabled executives to delegate responsibility to a few professionals rather than holding the entire organization accountable. Only by incorporating quality as a natural ingredient of management will it achieve fully the intended objective of benefitting both market- and ownership-based customers. This series of articles will describe an approach for “managing for quality” during the 21st century. This first installment explains the role of improvement in this comprehensive approach.

The Improvement Imperative

In 1916, Henri Fayol, a French mining executive, advocated for “a constant search for improvements.”

He further emphasized “management’s need to have an unrelenting intention to effect improvement” as a cornerstone of business leadership.³ These imperatives represent the first modern statements of the need to improve performance continuously and established this approach as a core obligation of management.

General Motors CEO Alfred P. Sloan Jr., subsequently emphasized organizational profitability, applying “the force of facts” for identifying constant improvement opportunities for “profitable growth.”⁴ His ideas were interpreted as a requirement for business to demonstrate continual improvement of financial performance through increased quarterly and annual revenues and profits.

In the early 1980s, W. Edwards Deming repositioned the focus of continual improvement. Instead of management blindly pursuing growing profitability, Deming stressed that leaders must understand the roots of that growth. He stated that “quality must be built in at the design stage... downstream there will be continual reduction of waste and continual improvement of quality in every activity.”⁵ He linked continual improvement of quality to the innovation process and to the daily management systems of organizations.

An ISO 9000-compliant quality management system aligns with this approach. The standard defines continual improvement as “recurring activity to increase the ability to fulfill requirements.”⁶ This activity is addressed by monitoring audit findings, data analysis, management reviews, and other sources constantly in the search for improvement opportunities.

Both Deming and the ISO 9000 standard refer to continual improvement, but the term “continuous improvement” is used more commonly. This phrase is based on a widely-accepted translation of the Japanese word “kaizen.” What is the distinction between continual and continuous improvement?

Continuous and continual both are based on the Latin word “*continuus*.” Continual dates from the 14th century, but continuous ties directly to the French derivative *continère*, which means to hold together and came into usage in 1673.⁷ Are these merely linguistic interpretations of the same source word, or is there a more profound difference?

It is possible to resolve this distinction by observing the subtleties of their usage, as described below:

- Continual implies a constant state of alertness—always being vigilant to determine if a possible change makes sense. Continual improvement, therefore, requires a rational review of opportunities in order to make strategic choices that will guide improvement. This review process is implied to be systematic and continuing indefinitely; it recurs regularly in a steady, rapid succession. Continual aligns with Fayol's concepts as well as the front-end analysis that supports Japanese Hoshin Kanri planning.
- In contrast, continuous implies an uninterrupted sequence of changes that occurs without the benefit of managerial review. This resembles the "white water" of a raging river that is flowing continuously from its headwaters down a vertical pathway and cascading through its channel to its ultimate destination.

Continual fits the concept of management better because it involves a systematic approach for controlling change through the iterative review and decision-making processes. Continuous is more reactionary and uncontrolled. The white water analogy brings an image of management steering a craft down the raging river, steering clear of the hidden boulders and other obstacles. This image leads me to prefer to use the term continual improvement because it is a more faithful representation of Fayol's original intention.

So, what conclusions can we make regarding continual improvement? It certainly does not involve a constant state of change merely for the sake of change. Instead, robust continual improvement must be embedded into a business strategy/plan that includes incremental, evolutionary change as well as discontinuous, breakthrough, revolutionary change. What we have learned impacts how we make decisions related to the need for change initiatives. A structured decision-making process is necessary for ensuring the most appropriate change option is selected. Organizational success in this arena, therefore, requires a management process that ensures changes drive growth in organizational performance.

Such improvement requires a never-ending stream of innovation, which emerges from systematic generation of creative ideas. Consideration

of all aspects of the organization's operations and impacts is necessary. Diverse ideas come from inclusive engagement of all stakeholders, and they lead to expanded perspective and increased decision-making quality. Continual improvement, therefore, begins with both a strategic organizational perspective and a democratic process for soliciting ideas and opportunities for improvement. On the other hand, it ends with an autocratic decision—a final choice from among the diverse options—and identifies the organization's future direction. This combination of an egalitarian front end and leader-driven back end works well. Ultimately, however, leaders interpret the ideas and define the vision and plans for moving the organization forward. It is management that establishes the overall process and is accountable for the final decisions; thus, continual improvement as described by Fayol and Deming becomes a function of management.

Since Fayol first established continual improvement as a fundamental concept of management, it has evolved into the global quality movement that has affected all types of enterprises and work disciplines. This total quality approach engages people from all functions and levels of the organization to achieve a common purpose. In an overarching sense, total quality not only improves organizational performance, but also increases the quality of life for all people through the organization's effect on society. We can conclude, therefore, that the total quality approach also is a function of management—one that reaches far beyond the organization's operations.

Models for Continuous Innovation

Motivation for continuous innovation is a driver of sustainable success. Here the use of the word "continuous" is chosen to describe the effort management must place on innovation. In this case, the white-water analogy fits because a successful innovation process involves ceaseless search and rapid management interventions to steer the organization past obstacles that may hinder progress.

Organizational leaders are faced with the two simultaneous, opposing trends described below:

- Customers always want more performance, and their expectations rise as markets develop to maturity; therefore, increasing capability is required from organizations to succeed.

- Processes degrade in performance over time due to the natural effect of entropy; therefore, processes tend to decrease in capability to perform.

The capability to produce an outcome is evaluated by recipients of that outcome—the customers, clients, beneficiaries, etc. This assessment involves a comparative judgment of the organization’s effectiveness—the ratio of recipients’ expectations for results to the performance of the process the organization uses to produce those results. The gap between initial expectations and the achieved performance gives rise to the motivation and constant need to improve work in the organization through management processes.

Fayol described the process of management as a series of activities: planning, organizing, coordinating, commanding, and controlling.³ He advocated that management foster a “constant search for improvements...that should be pursued unceasingly at all levels and throughout all parts of the business. The executive in charge should have an active, unrelenting intention to effect improvements.” He laid the foundation for the role of the modern executive just as Taylor¹ had established guidelines for the analytical understanding of work processes. Taylor proclaimed that “the system must be first.” In practice, however, Taylor worked only the bottom half of the system, and Fayol focused on the top-down perspective. Interestingly, the interplay between the daily work and the strategic direction is where many organizations fail in integrating their objectives. In the end, successful work requires an understanding of both of these theoretical approaches.

Russell L. Ackoff wrote “Successful problem solving requires finding the right solution to the right problem. We fail more often because we solve the wrong problem than we get the wrong solution to the right problem.”⁸ Fayol established the need for looking at business using different perspectives, saying “forecasts are not prophecies: their function is simply to minimize the factors as much as possible.”³

Managers have attempted to build various models of organizations and structures without reaching consensus on what is really important. We would do well to heed the advice of the eminent statistician George E.P. Box, “All models are wrong, some models are useful. Every model is an approximation—it is the data that is real

(they actually happened!). Don’t fall in love with a model. The model is a hypothetical conjecture that might or might not summarize and or explain important features of the data.”⁹

From this discussion, we can draw two conclusions, as follows:

- The process of management must satisfy a requirement for continual improvement that engages the entire workforce (both directions are essential: That is, the improvements that begin at the top and filter down for execution as well as those that originate at the “front line” of the organization and rise to the top for validation and approval).
- Whatever model is developed to describe the way an organization operates must address work as a comprehensive system and be both simple enough to explain how work is done and profound enough to provide value. Such a model should begin with the process of management that engages the various organizational levels to produce its output.

Ultimately, describing the requirements needed for an organization to attain performance excellence and inclusive growth must include quality and innovation as key components of management and the role of executives.

Future Articles

The next three articles in this series will focus on the role of quality and innovation as a stimulus for learning and building cooperation through a shared quality mindset. These all affect the process of management and provide the foundation for the more comprehensive “managing for quality” approach.

Note: The early thinking of Armand “Val” Feigenbaum can be traced using the migration of his publications during the initial 15 years of his career: “Quality Control as a Management Method,” American Institute of Electrical Engineers, 1946; *Quality Control: Principles, Practices, and Administration* (McGraw-Hill, 1951); “Total Quality Control,” Harvard Business Review, 1956, pp. 93-100; “Total Quality Control,” *Industrial Quality Control*, May 1957; and *Total Quality Control: Engineering and Management* (McGraw-Hill, 1961).

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social RESPONSIBILITY

Did You Know?

The Corporation for National and Community Service (CNCS), the U.S. Census Bureau, and the Bureau for Labor Statistics issue the annual *Volunteering in America* report. Data is collected from more than 60,000 households and 100,000 individuals. For the purpose of this study, "Volunteers are defined as individuals ages 16 and over who perform unpaid volunteer activities for or through an organization."

In the most recent edition researchers concluded, "Volunteers provide a powerful economic and social benefit to communities across the nation, with 62.8 million adults serving almost 8.1 billion hours through organizations in 2010..." (<http://www.volunteeringinamerica.gov/assets/resources/VIA2011NationalPressRelease080811FINAL.pdf>).

"Every day, volunteers of all ages are giving their time and talents to solve problems and make our country stronger," said Robert Velasco II, acting CEO of CNCS. "Americans are doing extraordinary things to improve the long-term health and vitality of the nation."

The median hours served per volunteer was 52, and the proportion who served at least 100 hours rose slightly to 33.8 percent. Volunteer efforts were valued at nearly \$173 billion. The report contains many facts that can be used for planning and tracking trends. As the report states, "Volunteers fill crucial voids in the community. Across the nation, organizations are serving our country's most vulnerable using fewer resources. In 2010, volunteers worked in a range of critical areas to bridge these gaps."

This is the second segment in a series of articles that addresses the history of the quality movement and its role in attaining inclusive growth for organizations.

A Comprehensive Approach to Quality Aims at Inclusive Growth

The Process of Quality Management

Gregory H. Watson

In the first installment of this series, the importance of continual improvement as a key management function was established. Now we'll explore the process of management. As a foundation for this discussion, we'll look at a modern model of management developed in the mid-1980s at Hewlett-Packard (HP) and illustrated in Figure 1.

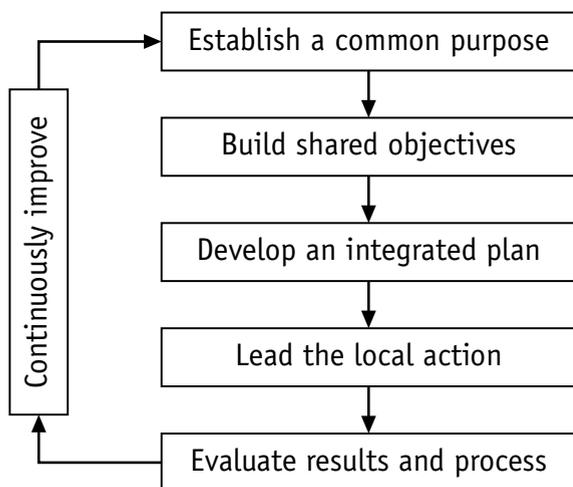
The HP model was developed using action research into the practices of the leading mid-level HP managers and is based on earlier work in Japan that developed the Plan, Do, Check, Act (PDCA) model, which often is called the Deming cycle (although the model

was actually developed by Shigeru Mizuno based on his interpretation of W. Edward Deming's early lectures in Japan). Perhaps the most innovative aspect of this HP model is its separation of a process of working (the process of management) from the content of this work (what flows through this generic process or the organization's daily management activities).

We can apply this model to the process for managing continual improvement in all areas of work. If this is an approach used for managing processes by quality (the means of a quality process), then how are the



Figure 1: Model of Modern Process of Management (POM)



quality content of products or services developed (the ends of a quality process)? To answer this question we must formally define the term quality and identify the boundary conditions for its scope or application.

What is Quality?

Quality can be defined in many ways, including the following:

- The attribute (or set of attributes) that describes an actual entity (a product or service) delivered by an organization.
- The experience by which we judge that entity's utility, value, or relative worth, as well as the perceived level of service associated with its delivery, as determined by its recipient—a client, constituent, beneficiary, guest, customer, etc.
- The system for assuring that the attributes and experiences satisfy recipients' expectations.

Quality, therefore, involves a systems approach—one that includes both the ends (outcomes) and the means (the components of the system—philosophies, methods, and processes or procedures carried out through human effort and engagement), as portrayed in the management process model.

The following methods commonly are used as the means for assuring desired outcomes are delivered to recipients:

- Standards, such as the ISO 9000 series.

- Business excellence models and self-assessment to monitor the maturity of the quality development process.
- Quality design approaches for innovation, using a process such as Six Sigma DMADV.
- Strategic continual improvement project management, using processes such as Lean and Six Sigma DMAIC.

This latter method, continual improvement, includes both an emphasis on shorter-term change management as well as longer-term strategic change. When we define the scope of quality, it must address all the following types of change:

- Evolutionary or incremental improvement of work methods.
- Revolutionary or transformational breakthrough discoveries of totally new ways of working.
- Approaches designed to maintain performance gains in between improvement cycles.
- Review or monitoring processes for detecting losses in performance and correcting/preventing quality deviations/problems.

The outcomes of the quality system extend far beyond the product and service attributes or the recipients' experiences, however. They involve myriad impacts that are generated along the way, which may affect workers, organizations, and society. For instance, an effective quality system provides for workers' safety and security of the enterprise. As a broader perspective on the means and ends associated with the quality system takes hold, it naturally becomes more inclusive, involving people's minds and efforts more expansively into the work of achieving quality.

When this happens, quality not only helps individuals meet their fundamental needs but also provides an opportunity for them to experience self-actualizing fulfillment by contributing to the organization and society's innovations and results. An inclusive quality system is achieved through an integrated approach—people with a quality mindset that aligns with their personal and cultural values in a way that defines a common way of working. This could be described as people "doing quality" as they are "being quality." Quality systems become stronger when energetic individuals are encouraged to take more

active roles—in other words, when those systems become more inclusive. Continual improvement requires continuous learning, which, in turn, requires organizations to move from a “commitment to the principles of quality” to an “engagement in the practices of quality” to the “involvement in development of quality.”

Why Does Quality Matter?

In a world of scarce resources, we must not squander their implicit value. We must pay attention to how we use our time—the length, scope, and degree of our involvement—as well as our finances—the money we invest to obtain value from objects and/or experiences. We cannot afford to lose quality either personally or on behalf of our organizations and society. Quality is an increasingly essential component of the human experience as mankind seeks to assure quality of life in all of its perceivable dimensions—an imperative to sustaining life as we know it. Without quality our world will suffer from entropy, and we will make poor use of its resources in the blind pursuit of economic development without creating appropriate value.

How Do we Assess Quality?

What are the dimensions by which we formulate judgments about quality?¹ In 1987, Harvard professor David Garvin created a definition of quality that serves as a framework by describing eight distinct dimensions of quality, as listed below:

- Performance
- Features
- Reliability
- Conformance
- Durability
- Serviceability
- Aesthetics
- Perceived quality

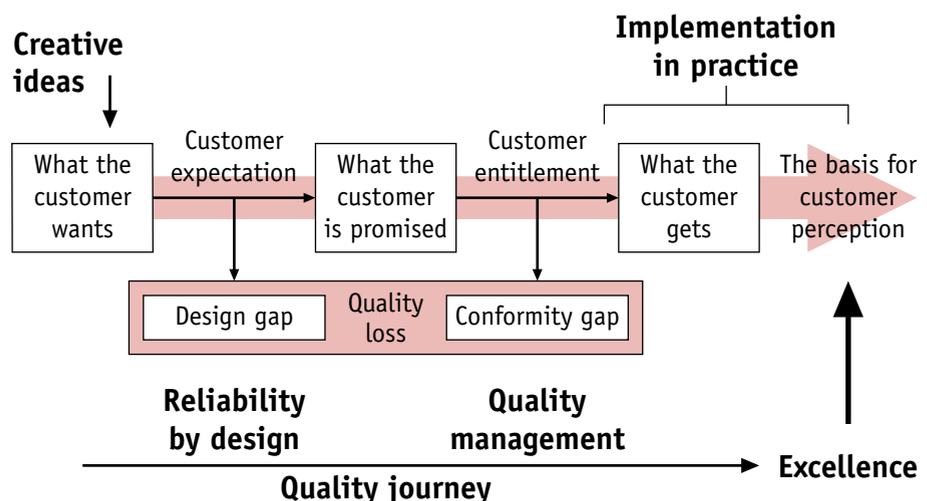
The interactions among these various quality attributes represent a spectrum of strategic opportunities for organizations to differentiate themselves

and their products/services from competing alternatives. Recipients, however, make their choices based upon the attractiveness of the relative quality propositions that are put forward by the competing organizations. In other words, quality judgments always reflect both a perceived need and alternatives for satisfying those needs. Strong cross-cultural considerations affect the determination of value.

Achieving quality outcomes often requires blending of several cross-disciplinary technologies, such as reliability engineering, auditing, statistical analysis, and measurement. The quality sciences, therefore, must be integrated into a well-designed system to achieve consistent outcomes on behalf of the recipients who make judgments regarding the adequacy of the products/services. Their opinions are based on the degree of attractive quality, as defined using the model of Noriaki Kano.² This model follows the process illustrated in Figure 2 for quality deployment in the process of management.

Here, quality is embedded expressly into the daily management of the organization by design of the actual entity (product) and/or the experience (service). It is a three-step process which delivers quality to the recipient, the evaluator of its value. As shown in this figure, the steps are to determine what the customer wants, promise the customer what outcome will be generated, and deliver that outcome, as summarized below:

Figure 2: Quality Deployment in the Process of Management



- *What the customer wants.* This process develops an imaginative understanding of the quality deliverable (either the actual entity and/or experience), based on an investigation of the attributes that will meet the customer's performance expectations. First, basic or foundational needs are identified and judged relative to a standard for performance. Then, potential alternatives are evaluated against competitive offerings to determine which attributes must be incorporated in the product/service design. Finally, quality attributes that provide unanticipated delight to the customer—the attractors—are introduced through innovation. Note that these attractors, however, provide a relatively short-term advantage because competitors quickly copy them. In determining what the customer wants, any gap in quality is a loss caused by the design and generally is addressed through reliability engineering. Furthermore, not all customer expectations must be met because the design must be balanced against the organization's commercial goals and its ability to engineer a product that will satisfy the critical requirements of its customers.
- *What the customer is promised.* The design process is followed by making a performance promise to customers that defines what product/service they should expect to receive. Additionally, the intention should be to fulfill the promise flawlessly.
- *What the customer gets.* People learn about quality by observing the entity and/or experience they receive. If customers perceive that the design is insufficient or that the product/service does not live up to its promise, they judge it to be lacking in quality. There are two new aspects of failure—poor execution of the design prior to delivery to the customer and poor design that generates problems with customer usage and/or service after delivery. In either case, these shortfalls from the promise will be perceived by the customer as a "lack of quality."

This management-based process ensures continual improvement of products and services as their value propositions become increasingly aligned with customers' expectations. The front

end of the process must develop imaginative ways of identifying customer application, described as "the job that needs to be done."³ Creative ideas, therefore, drive the quality delivery process, and as cycles of improvement occur, it becomes a journey that delivers excellence—value that customers use and appreciate. Excellence is a milestone on the quality journey; it is the eventual result of having built an inclusive quality system that fully engages people. As customers intensify their requirements, setting higher expectations, the required level of excellence also increases.

Learning About the Concept of Quality

The modern development of the concept of quality commenced a century ago after Frederick Taylor's work was published, as described in the first installment of this series. Since then, the focus on quality has changed. At first, assuring that already manufactured products met specifications was emphasized through standardization, measurement, acceptance testing, quality inspection, and quality control. As learning increased, the focus shifted to controlling processes during production so that outputs were acceptable through the discipline of quality engineering. Quality assurance came next when organizations recognized the need to align engineering specifications to contracted customer requirements. As an understanding of the value of including all employees in the process of continual improvement emerged, total quality management was born.

Today's emphasis on comprehensive quality recognizes the need to integrate quality across the entire business system, including extensions to the supply chain and distribution channels. Furthermore, it expands the scope of quality to a global system and incorporates reliability—quality that is enduring. Business leaders now must build a process of management that establishes reliable organizations—ones whose promises warrant customers' confidence in the organizations' ability to deliver on these commitments. Continuous innovation and reliable development both must be included in the modern version of continual improvement. Excellence is result of habitually doing the right things in the right way, which is the consequence of thinking and doing quality. Under these circumstances, quality matures into

a pervasive mindset that prevails in individuals, teams, and organizations. Quality thinking motivates action to apply principles, methods, and tools to deliver the right work outcomes as judged by customers.

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This is the third segment in a series of articles that addresses the history of the quality movement and its role in attaining inclusive growth for organizations.

A Comprehensive Approach to Quality Aims at Inclusive Growth

Integrating Innovation Into the Process of Management

Gregory H. Watson

In the first segment of this series, the importance of continual improvement as a key management function was established. The second segment explored the process of management. Now we will discuss how innovation fits into the overall quality system and improves the process of management.

Quality is generated by people working together in organizational processes that respect them as individuals and allow them to work with pride through personal contributions to a democratic process of continual improvement. This engagement forms an intersection between quality and

social responsibility through the broad application of organizational learning as a renewable process of innovation. Such organizational learning, as well as the process of innovation, is integrated within the management process through the quality delivery process. To understand what this means we must review some closely related concepts:

- *Creativity*: Generation of imaginative ideas without regard to practicality or ability and ease of implementation; success is measured only by the number of new ideas. Creativity refers to the act of producing new ideas, approaches, or actions. This is the

origin of the “white water at the headwaters of the innovation process.”

- *Invention*: The imaginative discovery of ideas that define a potentially practical new device, composition, gadget, or process that did not exist previously. Inventions may be derived from pre-existing works (in incremental improvements or variants of prior works), or they may be conceived independently (as radical breakthroughs).
- *Innovation*: Ideas applied in practice; the entire process by which an organization generates creative ideas and converts them into novel, useful, and viable commercial products, services, and business practices. Although creativity is the generation of novel ideas, which is a necessary step within the innovation process, innovation is the process of both generating and applying creative ideas in some specific context. Author Max McKeown commented that innovation is “a new way of doing something or new stuff that is made useful.”¹
- *Engineering*: Designing and implementing useful features and functions at the lowest total cost (including the cost of failure).

Innovation, therefore, is part of continual improvement in both its incremental form (such as evolutionary improvement) and in its breakthrough form (revolutionary improvement). An organization uses innovation to ensure that the quality features of its products and services are developed into attractive quality where the perceived value exceeds that of alternative choices. Quality, therefore, incorporates innovation as part of its core delivery process, just as it is inclusive of problem solving and managing daily work. How can an organization consciously develop such an explicit approach to embedding quality? Organizations must learn to take positive action because

developing quality is not a natural act; it comes from having a quality mindset that is learned from experience. The process to create the best quality system for any organization is called “triple-loop learning” as shown in Figure 1.¹

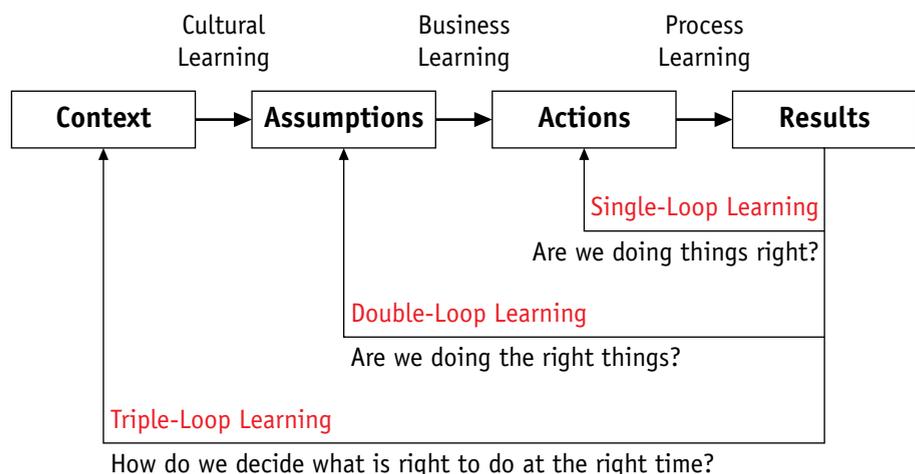
The First Loop: Managing Continual Improvement

Harvard psychologist Chris Argyris² defined “single-loop learning” as the analysis of results to evaluate actions (or methods) and answer the question: Are we doing things right? This focus on the content or outcomes of process actions provides for “detection and correction of errors,” or solving the immediate problem, and seeks to learn how to do things consistently right. At this level we engage the daily work practices and operate the quality management system with the objective of obtaining a state of control over the work that is done to ensure a consistent outcome. Some aspects of single-loop learning are:

- Document the current standard work process.
- Instill discipline into work process measurement.
- Ensure quality review of work outcomes or products.
- Implement corrections to ensure standard results.
- Design preventive action to eliminate future problems.
- Change the standard work definition to ensure quality.

Single-loop learning applies to all process workers at all levels of an organization and it

Figure 1: Triple-Loop Learning



focuses on the execution of daily work process using work standardization, process improvement, and problem-solving methods. This type of learning devises an integrated system of work processes to eliminate waste and defects (commonly used quality methods include: ISO 9000, lean production methods, and the Lean Six Sigma DMAIC process). This first loop of learning is the realm of quality control, quality engineering, and quality assurance.

The Second Loop: Engineering the Quality Management System

“Double-loop learning” occurs by questioning the system of learning resulting in correction of underlying principles, assumptions, theories, and policies of the organization or implementing insights for change that were identified in the detection and correction process. Quality management rules in this second loop of learning. This learning process focuses on the question: “Are we doing the right things?”

At this level we design the business system and engineer the quality management system to preserve a continual improvement process. Common tasks related to this cycle of learning include creating the methods that support single-loop learning activities such as:

- Developing a standard problem-solving process.
- Developing a standard process-mapping and analysis method.
- Developing a standard performance-measurement and reporting system.
- Developing a standard for risk and failure analysis method.
- Developing a standard process for change management.

Activities in this second learning loop are driven by the business process improvement and quality management staff and focus on cycles of learning to apply the first loop better by developing and improving standard ways of working through a structured review process (usually quarterly, bi-annually, or annually). This process gathers input that is distributed across the organization as well as from external partners (suppliers and distributors). It then centralizes

the understanding of what, where, and how to improve by reviewing lessons learned, best practices, and the results of failed project activities to increase the effectiveness of process and project performance.

The Third Loop: Transformation Management

The third learning loop is a leadership rather than a management effort. It is directed at the adaptation of the organization to its changing context—the external environment in which it must operate to remain effective. At this level the organization is transformed by learning what needs to be different in its operating system: How does the organization decide to do what is right? Triple-loop learning focuses on what the organization needs to learn or learning how to learn differently. This provides the basis for permanent change in the way people work and is the realm of leadership that has the organizational power to mandate new directions and align resources to reshape the way an organization operates through evolution of its genetic code or DNA.

The executive management team typically handles the activities in the third learning loop. The focus is on developing an organizational process for change management as well as determining the context in which new content should be orchestrated into the management system. This process should be concentrated in a self-assessment of the organization’s maturity that is conducted annually as a prelude to strategic planning. The objective should be to identify strategic change projects that reshape the organization’s process capability to achieve its strategic intent. In the language of Six Sigma, this is called the “recognize” step, which generates either DMAIC or DMADV improvement projects. In a Japanese “Hoshin Kanri” system, this represents the culmination of the “catchball” process that specifies the Hoshin objectives to achieve by aligning the organization’s efforts.

In summary, single-loop learning occurs during problem solving of work processes while double-loop learning occurs during management review of improvement projects by integrating lessons into the organization. Triple-loop learning occurs through reflective review of change management efforts, scanning the organization’s

environment, and identifying what additional insights bring new knowledge for adaptation into the organization's culture. The triple-loop learning process, therefore, is a significant component of the management process and essential for driving continual improvements by quality innovations in the process of management.

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