

Putting Quality in Knowledge Management
The Quality Professional's Role in Corporate Memory Management



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Quality has won. No organization today—whether in the industrial, service, or private sectors—can hope to sustain financial health without embedding the principles and tools of quality into its day to day thinking and operations. Whether or not your organization has succeeded in implementing a full TQM program or uses the quality tools on a daily basis to measure and manage its operations, our society has been infused with the language of the quality movement. Kaizen is almost a household word, and at least from the perspective of customers, quality is the requirement driving us all.

In the July 1996 issue of *Quality Progress*, the future of the Quality Professional was explored, nine critical trends for change were described, and statistics were related to help identify what direction the quality movement should take to insure its own survival in the age of the “knowledge worker.” Our purpose here is to consider the unfolding of some of those trends two years later, and to describe what we see as lines of continuity between the past role of the quality professional and the emerging requirements for knowledge management.

Trends Impacting Quality

In the July 1996 issue of this magazine the ASQ Futures Team identified 9 critical forces impacting the role of quality professionals. (*Where Will They Fit In?* p. 34)

1. Changing values
2. Globalization
3. Work force makeup
4. Information revolution
5. Velocity of change
6. Increased customer focus
7. Leadership
8. Quality expansion into new areas: feedback and learning
9. Change in quality practice: integration into daily work

The Futures Team also described four possible scenarios for the future of quality engineers and quality managers, only one of which included any leadership role for those who have spent the last two decades shaping management science in industrial and public sectors alike. In general, the Futures Team sounded an alarm in this issue, suggesting that as quality becomes integrated with daily work (the good news) the role of quality professionals could dissolve (the bad news). With the rapid emergence of knowledge management in the last two years, we see a very different possibility arising for quality professionals. In fact, it would seem to us that the role of quality has had as significant an impact on this emergence as communications technology has had, and a critical role exists for quality professionals who can see the continuity between the quality revolution and knowledge management.

In another article of the same issue, *Trends and Key Forces Shaping the Future of Quality* (pp 89-98) the Futures Team identified numerous possible roles for quality professionals that might emerge as a part of the knowledge era. They cited statistics that indicate “by the year 2000, industrial workers will be no more than 13% of the work force in every developed country in the world,” and “the knowledge worker will constitute up to 30% of the U.S. work force. This moderate percentage may indicate a definition of “knowledge worker” as one who uses information technology as a primary work tool or medium. If we define knowledge workers more broadly as all those who create, document, transform, and share knowledge, this second percentage rises considerably. The latter definition has greater application to knowledge management practices and requirements, but with the rapid dissemination of computers throughout society and the increasing acceptance of the Internet the two definitions may merge sooner than we imagine. In any case, the need for quality tools and measures for the quality of knowledge is becoming more obvious. Internet content standards must be defined and protocols developed for access to knowledge pools and wireless communications. Quality professionals can help determine the quality of information available to customers and can develop effective communication processes to enable organizations to share goals, measures, and key processes with employees, suppliers, and customers.

Even more interesting were the references by the Futures Team to emerging roles for quality professionals related to leadership (moving quality into vision and strategy) and to education. They suggest that quality professionals could

1. *Facilitate the dialogue on the quality of vision and strategies*
2. *Create the process to identify and create wisdom (knowledge from info, wisdom from knowledge)*
3. *Assist industries in discovering the highest value-added to society*

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In education, they identified several new areas requiring quality guidance: “Electronic training and dramatic learning advances; interactive educational media for learning in businesses; multi-site electronic commerce; virtual training institutions that enable people from all over the globe to receive high caliber training instruction via simulations, self-paced study; and electronically linked group projects; online distance education—no longer location dependent.” In this field quality professionals could

1. *Reorganize education systems through understanding customer focus, benchmarking (best practices), process redesign, and standards setting*
2. *Establish standards for virtual education*

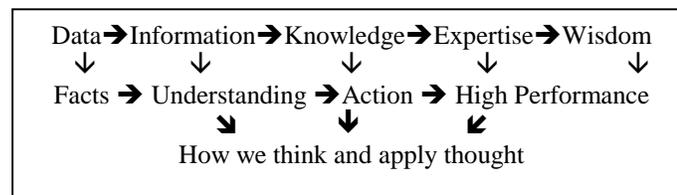
The suggestions of the Futures Team in 1996 have emerged as powerful requirements for knowledge management and the role of quality professionals seems no longer a stretch but an obvious fit.

Continuity of goals and fundamental principles

Knowledge management aims to improve organization effectiveness by increasing intellectual specialization and the ability to “do the right thing,” to improve efficiency or the ability to “do the thing right,” to reduce rework, to improve focus, and to eliminate work that can be automated. The goals of a knowledge-based organization include continuous learning, renewal, and sustainability. Sound familiar?

Knowledge management may seem like something wholly new, a quantum leap, or perhaps even another consulting gimmick, but it may well be the next round of “low-hanging fruit” in the continuous improvement process, whose boundaries have extended beyond the team, the department, and even individual organizations. The principles of quality are impacting and challenging whole industries and giving rise to the new field of knowledge management. This is a cultural movement as much as an organizational one. And knowledge management is an indication of the success of the quality movement, and its result—an exponential shift, not a quantum leap, in the application of quality principles.

How we think determines our actions



In knowledge management, standard definitions of data, information, and knowledge show the three related to each other like a fish food chain, each encompassed by the next. Data is raw, unrelated facts; information is facts that have been given meaning and relationship; knowledge is information that supports and leads to action. Action is defined as anything we think, feel, or do. Action is the means and the end of knowledge. Knowledge management proposes to identify, optimize, and extend our ability to act effectively. Best practices and expertise lead to high performance as we learn how to apply what we know and adapt as we learn. The essential action we must perform and that enhances all other actions is our ability to think. Improving our ability to think is the cornerstone of knowledge management, and the centerpiece of all knowledge transfer practices. The quality movement has laid the foundation for clear organization thinking by applying scientific methods to production and business process improvement and a process focus to performance measurement.

The quality movement began with an emphasis on the collection of pure data—process analysis with SPC and the 7QC Tools. Root cause analysis identified meaningful relationships in the data and allowed teams to focus on the

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vital few operational issues that would have the greatest impact on process capability. Quality methods and tools provided the means, then, to continuously improve each process and optimize individual performance as well as overall organization effectiveness—increased product and service quality, reduced costs and cycle time. Enabled by technology the quality movement now manifests as knowledge management. Inherent in knowledge management is the understanding that not only what we think but how we think determines our actions. KM is about how to think better and learn faster; its purpose is to provide rapid access to expertise throughout whole systems as needed to enhance individual learning and expert performance. Wherever quality principles have been applied, knowledge management has fertile ground to grow effectively.

Core principles

The quality principles that support knowledge management include a focus on process, employee involvement, continuous learning and improvement, measurement and standardization.

Focus on process

Quality methods reduce the variations in workflow processes and reduce waste within process flows, ultimately adding value through conformance to specification as well as process speed and cost effectiveness.

1. This requires a commitment to understanding all of your operations as a collection of interrelated processes that have a common, consensus-based understanding of what the process is
2. Appropriate measurements to understand the effectiveness of the process, continuous evaluation for improvement opportunities—where and how to eliminate waste and nonconformance
3. The right allocation of resources to accomplish the improvement opportunities.

Process improvement focuses on actions; consequently, it is the primary link to knowledge management. A process-oriented approach is directed at the process by which an event or outcome is accomplished rather than the outcome alone. Knowledge management is about supporting individual and organization performance. It is about process enhancement. By addressing process, sharing how to perform processes, knowledge management can optimize the continuous improvement potential of an organization, and *vice versa*. The primary measurement of effective knowledge management is time—how long does it take to find, to focus, to elicit, to optimize, to share, to apply, to record, to improve the resident knowledge of the organization? Focus on process time in knowledge management will lead to quality and cost improvements, just as it has in the quality improvement effort.

Total employee involvement:

Central to quality management is the development of an aligned, trained, empowered work force, a cross-functional, no-blame culture, and appropriate structures to support a team-based organization. Successful employee involvement depends on understanding the value of people's knowledge about the work they do as a vital asset of the organization and the key to cost effective operations. Total employee involvement means the vital involvement, authorship, and ownership of all from top to bottom in the outcomes of the organization and recognition of the interdependencies that requires and creates. The paradigm shift to knowledge-based organizations stems from the emerging social definition of how we value work and the understanding of people as assets. Each individual in an organization should be empowered to participate in an improvement process that carries out and informs management's vision and priorities. Empowerment entails appropriate training, performance support, coordination of efforts, and authority to act autonomously. Knowledge management will enhance an organization's ability to capture and disseminate the expertise of all its employees. This will be achieved through structures that evolve from teams to cross-functionality, and ultimately to networks of interconnected individuals and groups aware of one another's processes and learning from one another continuously. Knowledge management will give people the opportunity to inform others and to share in the authorship of processes and decisions that directly affect them and the organization. New skills will be necessary as well as access to know-how that enables them to perform optimally.

Process improvement requires communication between and coordination of efforts and expertise from various functions, divisions, and other sub-elements of an organization. This may be carried out in a range of ways, from teams that merely meet together in a functional organization to teams that work together in an integrated one. As the nature of work changes to increasingly include virtual teams, contracted knowledge workers, and global enterprises, enhanced communication systems will be needed to insure the quality of knowledge transfer. In a knowledge-based

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culture the work of the enterprise is designed and carried out by people who have been provided clear, concrete goals, appropriate skills, and necessary resources to get the job done. The groundwork for such a culture has been laid by the quality effort where people have both the time and opportunity to be creatively involved in developing and implementing their own ideas toward achieving the organization's goals and improvement of its processes. Effective knowledge management emerges from as well as enables total employee involvement by tearing down the communication barriers that limit the creativity of a fully informed workforce.

Continuous learning and improvement

Continuous incremental and innovative change toward measurable objectives builds momentum to transform an organization toward world-class knowledge management. Quality activities reduce the gap between current conditions and customer-required conditions and beyond those to ideal conditions (continuously expanding the envelope of possibility). They standardize the improved method, promote adherence to standards as the basis for building further improvement. Understanding the value of standards was the starting point. A willingness to experiment—recognition that we will discover more answers through action than we can predict through analysis and discussion—is the thread that has led to knowledge management, which focuses on learning while doing. New skills and disciplines will be required to follow that thread. Time must be structured into daily work for reassessment, measurement, implementation and documentation of new approaches. Knowledge management must deliver the required flexible processes for handling feedback from all areas of the enterprise—customers, suppliers, workers, stakeholders; it must capture and provide access to all feedback and adaptation of processes to accommodate the feedback.

Measurement and standardization

Improvement can only be effective when fact-based and derived from root cause analysis and cannot be accomplished without continuously measuring the outcomes of the process. This includes performance measurements of the organization, measurement cycles of improvement activities, and reward systems that support continuous improvement and team-based learning. In a quality environment, measurements must be established as specific targets in order to sustain continuous improvement. When targets are met new ones must be established. Measurements must be based on actions (rather than structures, policies, or individual performance). Organizational measurements must not conflict with process or activity measurements. It is not whether you measure but what—you get what you measure. Quality improvement is measured on the bases of goals that relate to service to internal and external customers and reduction in waste and costs. Goals and results are communicated to every member of the organization on an ongoing basis, and employee rewards and compensation are based in large part on the process results.

The development of quality measures for knowledge management is the greatest opportunity confronting quality professionals. Once knowledge processes are defined, it will be important to establish a measurement cycle to measure the outcomes of these processes, test improvements, set goals and objectives in measurable terms, standardize improved processes, measure outcomes of new processes, and set new objectives. If quality improvement empowers people, then measurement has empowered quality improvement. It ties daily activities to the bottom line, provides a concrete feedback process, determines what to measure, and ties rewards to process performance. All actions must be based on fact (things as they are). This requires first a spirit of scientific inquiry (seeing the work place as a learning laboratory) and second, a disciplined commitment to continuously monitor, document, analyze, and share the results clearly with everyone involved. Knowledge management is a logical extension of this understanding and knowledge measures will insure effective installation of knowledge management practices.

Continuity of methods and tools

TQM evolved from the refinement and application of the quality tools to become a system-wide methodology for managing work processes in alignment with organization vision and strategies, and even became part of the visions themselves. It expanded from the shop floor to product design teams and eventually encompassed corporate strategy and customer feedback in shaping the direction of the organization. It leaped from manufacturing environments to service sectors and home environments. So too, knowledge management has begun as a plethora of software tools to

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support learning and knowledge transfer, and now calls for a systematic methodology for developing and managing the knowledge base of an organization.

Corporate Memory Management™

Corporate Memory Management* is a systematic methodology for implementing knowledge management tools throughout an organization. It includes methods for thinking better, learning faster, and sharing what is known effectively and as needed among individuals throughout an entire organization. It is about making effective thinking practices part of the strategy as well as the operations of an organization. It is fundamentally about consciously eliciting and disseminating the principles of adaptation from and through an entire system, so that an organization can begin to function as an organism.

[Insert corporate memory image here]

Corporate memory is an interrelated network of a group's decisions, rationales, processes, best practices, policies, and procedures that exists independently of the individuals who contribute to it. For purposes of this discussion, a group is defined as two or more individuals who have merged their thoughts, feelings, and actions to achieve a common goal. As long as the composition of the group remains stable over time (no turnover for at least 5-8 years) and relatively small (2-4 people), memory of the group's process knowledge, decisions, actions, and rationales resides in the long-term memory of the individuals. Difficulty arises when someone leaves the original group (moves on to another job, retires, dies, becomes ill), and is replaced by a new person.

When someone leaves the group, that individual takes his/her unique perspective of the group's process knowledge, decisions, actions, and rationales that were stored in his/her long-term memory. If the entire composition of the group turns over, eventually there is no one left who holds in his/her individual long-term memory the process knowledge, decisions, actions, and rationales of the original group. To make a newcomer's situation even more difficult, the impact of decisions and actions may not be felt within the organization until 5-8 years later, when no one is left who remembers having made these decisions and taken these actions, never mind the rationales behind them. The literature speaks of this phenomenon as "corporate amnesia," but in cases of amnesia, long-term memories existed once and have been lost or blocked from some type of trauma. In organizations that have no corporate memory, a network of long-term memories never existed. For organizations, there is no natural phenomenon of memory as exists in organisms. Memory only resides in the individuals.

Without a collective long-term memory for the organization, there is no foundation for organizational learning to occur over time. The complex structure of interrelationships that grows within the long-term memory of individuals never occurs for the organization as a whole. The organization is forced to "re-invent the wheel" as turnover occurs within the group, and group members take their individual long-term memories with them as they leave.

Organizations must develop a methodology for transferring the long-term memories of individuals into a long-term corporate memory for the organization, so that these memories can be captured and easily accessed by successive

[The following list can be a sidebar or shaded box if there is room]

Some of the critical functions in CMM are to

- Address cultural issues and change management.
- Build trust necessary for knowledge harvesting.
- Communicate value of knowledge-based assets to stakeholders.
- Create a budget for a corporate memory management project.
- Create a personal Kit that can be used by all organizational members in order to (individually) self-harvest.
- Create a smart product development methodology.
- Create ad copy, which accentuates features and benefits of corporate memory management.
- Create income based on the licensing of a knowledge asset.
- Create personal responsibility for corporate memory management.
- Define the strategic role of knowledge in the organization.
- Derive compensation algorithms based on knowledge transfer objectives.
- Develop a work profile for a Knowledge Harvester.

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- Develop a work profile for the Chief Knowledge Officer.
- Develop rewards and recognition for CMM projects, as well as specific CMM process-related actions/tasks.
- Educate suppliers and partners (about basic concepts of knowledge management).
- Embed knowledge into products.
- Embed knowledge into services.
- Encourage the creation of new knowledge assets.
- Establish a channel for managing knowledge between organization and customers.
- Establish a new performance measurement system.
- Establish a portfolio of knowledge-based assets.
- Establish an enterprise-wide vocabulary (terminology and definitions) to ensure that knowledge management concepts are understood.
- Establish the corporation's common language – the terms and definitions for knowledge management concepts.
- Establish the parameters of a value proposition
- Establish/initiate a knowledge management function.
- Evaluate and buy knowledge assets.
- Formulate a knowledge-oriented vision for your project, team, division, or organization.
- Gain top management support for corporate memory management. Develop the business case for CMM.
- Harvest supplier or customer-related knowledge.
- Identify issues related to cultural transformation.
- Identify the corporate cultural transitions necessary for deliberate knowledge management.
- Identify the key ideas to communicate for gaining commitment for corporate memory management (among organizational workers).
- Improve knowledge capture and productivity in meetings.
- Integrate a knowledge schema into a digital signal processor (DSP).
- Integrate knowledge management with organizational strategy.
- Introduce CMM: A functional definition of knowledge management.
- Introduce CMM: Distinctions/definitions among/of data, information, and knowledge.
- Introduce CMM: Key Concepts in Corporate Memory Management.
- Introduce CMM: Why CMM is a Business Requirement Now.
- Introduce KM: Model the Relationship Between Knowledge and Value.
- Localize a knowledge asset (to language and local culture).
- Map knowledge transfer between organizations (process orientation).
- Measure the cost of knowledge transfer.
- Measure the scope and maturity of an individual's (articulated) knowledge base.
- Measure the scope and maturity of an organization's (articulated) knowledge base.
- Modify commercial search engine to organization's specifications.
- Package knowledge for sharing with external organization(s).
- Provide ideas for redesigning the physical work environment in order to improve an individual's ability to manage information and know-how.
- Recommend or configure and install remote elicitation support systems.
- Select a knowledge interchange standard: SGML, KQML, KIF, ADL Meta-data
- Sell or license knowledge assets.
- Standardize a project/change management methodology for enterprise-wide deployment.
- Start a knowledge management program by reusing components of your existing quality/process improvement program.
- Trade knowledge assets.

generations of group members. A company begins creating its corporate memory by harvesting the knowledge that exists within the organization's individuals and creating processes for ongoing capture of and access to decisions and processes as they evolve. The knowledge is then organized and optimized for application. After repeated use, knowledge assets are evaluated and adapted as needed. We call this set of processes "the wheel of actions" and they make up the primary tools in knowledge harvesting.

Knowledge Harvesting™

Knowledge Harvesting* is an integrated set of processes that allow the often hidden (or tacit) insights of top performers to be captured and converted in to specific, actionable know-how that can be transferred to others. Through software, corporate memory can be transferred to thousands of employees simultaneously or on a "just-in-time" basis. Mass mentoring becomes a daily reality in which selective, pass-along elements of the corporate memory are actualized. Harvesting actionable know-how is a subset of the much broader and less definable field of knowledge transfer.

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The purpose of harvesting know-how is to capture and express expertise in a way that can be easily accessed and used by others. Successful thinking is made visible, manageable, and useful to more than one person. LearnerFirst has extensive experience in eliciting, codifying, and formalizing know-how. We employ a proprietary methodology that enhances our ability to harvest knowledge from content experts. We then break this know-how down into its smallest, component parts while preserving its unique structure, characteristics, and relationships.

The benefits of harvesting are a 1990's extension of TQM: breakthrough improvements in the quality of products and services with significant reduction in expenditure of time, energy and cost. Valuable knowledge is immediately accessible anywhere in the world by anyone in the organization who needs it, when they need it. Decisions can be made faster and at lower levels. People can work with less supervision and intervention. Cross-collaboration among work teams is enhanced.

Harvesting can be applied to virtually any kind of human knowledge (know-how), whether rocket science or routine. All organizations have individuals who excel at performing the organization's most important work – its core processes. In the process, we enable top performers to verbalize their tacit know-how and thereby make it explicit. Tacit know-how is composed of the subjective knowledge, insights, and intuitions possessed by a person who has depth of understanding in a particular area of expertise. Two main benefits of CMM are:

1. Time reduction—process applications allow individuals to perform with no lapse in time between instruction, learning, thought, action, and record keeping.
2. Improved thinking and decision making—process applications contain everything the organization knows about a particular process and deliver this know-how in an individualized manner for optimal performance.

Knowledge Assets

A knowledge asset is the codification of human expertise. It is stored in a digital/electronic format; it creates organizational value; it is owned property of the organization, invulnerable to human memory loss or economic downturns; it can be deployed via Intranet technology. Knowledge assets promote understanding, provide guidance for decision making, record facts about critical decisions, and create meta-knowledge about how work actually adapts to changes.

A knowledge asset is knowledge that has been

- Elicited from those who have profound knowledge of a process or content area
- Organized in a logical manner for easy transference to others
- Optimized into a format that will support the learning of others
- Shared with others who need to understand the process or content

The process of creating knowledge assets is the fundamental activity of corporate memory management. As an organization's ability to create and disseminate its knowledge assets increases, direct relationships to organization performance can be drawn. Just as quality, cost, and delivery in the quality framework exist in reciprocal relationship to one another, so the quality of the knowledge base (corporate memory), the cost of harvesting expert knowledge, and the time required to learn and apply new knowledge exist in a similar relationship. As knowledge assets accumulate and the corporate memory expands, the cost of finding and accessing expertise goes down, and the ability of individuals to improve their performance goes up. This "QCD of Corporate Memory Management" can aid in tying knowledge management activities to the bottom line.

The Wheel of Actions

There is growing awareness that knowledge in organizations is an important asset to manage. However, there have only been discussions of the fundamental actions associated with managing knowledge. The purpose of this section is to describe the fundamental actions associated with managing knowledge. The phases of Corporate Memory Management encompass eight fundamental actions of Knowledge Harvesting. Each action is a process, which exists solely to make knowledge practical and applicable for its users. The Knowledge Harvesting™ process is the PDCA of knowledge management. It is a structured, iterative methodology for transforming individual knowledge into valuable organizational knowledge assets that can be shared by others. The Wheel of CMM Actions includes the following:

- 1) Focus on what you need to do

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- 2) Find—identify what you need to know and where it exists
- 3) Elicit the know-how
- 4) Optimize the knowledge
- 5) Share it with individuals and teams
- 6) Apply the learning
- 7) Evaluate results and the accumulation of knowledge
- 8) Adapt the corporate memory

[Insert “wheel of actions” diagram here]

Focus

To focus means to identify core processes within your organization that are seen as strengths, weaknesses, or opportunities for improvement. Opportunities exist to balance centralized institution-wide efforts and local projects. You can develop a business strategy for managing corporate memory, assess organizational readiness for Corporate Memory Management, or initiate strategic planning. Much of the perceived importance of managing knowledge assets seems to be initiated from some strategic planning experience. It will be important to identify strengths/issues/opportunities for improvement of core processes.

Here are some examples from our experience of ways that organizations have focused their Corporate Memory Management activities:

- We want to build on our strengths. This is the most important work that we do.*
- The company is most vulnerable in this area. This obstacle is a serious impediment to the fulfillment of our goals.*
- We keep experiencing organizational brain drain. Our best expertise is leaving.*
- We are concerned because our suppliers possess all of the know-how in this process.*
- We need to focus on where the cash flow of the organization is generated.*
- We keep “reinventing the wheel.”*
- We want to package and deploy our knowledge to customers.*
- Based on our recent merger/acquisition, we need to consolidate and streamline this core process.*
- We must mitigate the risk associated with restructuring.*
- Our intranet has a tremendous amount of content, but people can't find what they are looking for in order to accomplish their work.*

When focusing is complete, you will have decided on a core process to initiate the creation of your organization's corporate memory.

Find

Determine what knowledge is required to support the business strategy. Index people, skills, and know-how. Identify the individuals who will participate in knowledge harvesting for creating a particular knowledge asset. Mine the support information from existing publications and other printed and electronic media to extract pertinent support information.

Elicit

Elicit know-how from everyone who has good insights, including those individuals who don't normally publish their insights because they feel that they would be giving away their ideas. Get inside the mind of expert performers in order to uncover the thinking and tactics involved in their performance. Develop a culture that reinforces those who record and share their process knowledge with others. That knowledge is power is not new. What is new in the knowledge era is the shift from holding knowledge to the need to share knowledge. Measurements can be focused to increase the speed, reliability, and quality (accuracy, clarity, maturity, etc.) of an organization's ability to share knowledge. Knowledge transfer time will become the new driver of organization competitiveness in the next century.

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Optimize

Knowledge has two purposes—to improve the ability to act and to increase understanding for action. Knowledge optimization clarifies the knowledge asset accordingly.

Organize

Elegance of a knowledge asset depends on careful consideration and organization of relationships between the steps to be communicated about a process and the support information to clarify those steps. As capability in this phase increases, an organization's ability to disseminate knowledge assets and the ease with which individuals apply them will be enhanced.

Share

Create useful knowledge assets, which support a particular way to perform a task that is most likely to produce superior results consistently. Build performance applications designed to disseminate knowledge assets on an as needed basis to everyone in the organization.

Apply

Support everyone who needs to access the corporate memory. Proper explanations and demonstrations are often necessary. Training in the use of communication and database technologies will enhance people's ability to find and use existing applications and knowledge assets that reside in the corporate memory.

Evaluate

Calculate the value of existing knowledge assets and determine if the knowledge asset is effective. Use graphs to visually depict and tracks the changes to your corporate memory. Create aggregate measures (and charts) for an individual's, team's, or unit's knowledge base. Determine meta-knowledge parameters and a process for use and administration. Evaluate meta-knowledge. Evaluate a knowledge asset's effectiveness, efficiency, and patterns of use. Communicate the value of knowledge-based assets to stakeholders.

Adapt

To adapt means to improve the outputs and cycle time associated with a knowledge asset. As assets are applied new knowledge will emerge. People need to know how to record their learning; and systems for capturing ongoing learning need to be in place so that corporate memory continually evolves and matures.

Continuity of roles for quality professionals

Clearly, a new challenge for quality professionals has arisen in the knowledge management movement. Our understanding of the potential for rigorous, deeply meaningful and effective knowledge management emerges out of the quality role as much as from the exciting innovations in information technologies. The degree to which quality professionals can grasp and master this growing potential will determine their ability to shape the knowledge era and insure that quality principles continue to drive organization strategies. In the following table, we compare traditional quality practices with the phases of CMM and list questions and issues that will help quality professionals define their role in installing CMM practices. This is an evolving list, and we welcome ideas and examples of your experiments in establishing a continuity to knowledge management in your organization.

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A Table of Comparisons

Quality Practices (common label for QM activity)	CMM Phase	Contribution to CMM (how to apply QM learning to knowledge management)
Audit <ul style="list-style-type: none"> • Observation and physical examination techniques to detect variation. • Different types of objective, ethical audits using and interpreting applicable standards/requirements. • Corrective Actions 	Find Adapt	<ul style="list-style-type: none"> • Approaches, methods and checklists can be used as a basis for creating CMM processes. • Understanding the proper use of descriptive statistics and sampling theories will allow quality of knowledge to be assessed • Monitoring, capturing, and verifying what is being learned as new knowledge is applied can and must be added to the corporate memory "bank" so that the knowledge assets and access to them continually evolves.
Awards, Professional Recognition <ul style="list-style-type: none"> • MBNQA, state awards • Shingo award, • team-based recognition systems • unique internal systems of awards and recognition 	Apply Share	<ul style="list-style-type: none"> • What was necessary to incite encouragement among organization's stakeholders? • How did awards help with validating the efforts? • Did awards provide organizational members with a sense of relevance and importance to organizational goals? • A system to award knowledge sharing (instead of knowledge hoarding) must be developed
Best Practice Management, and Bench-marking	Focus Find	<ul style="list-style-type: none"> • The goals are similar to benchmarking—finding a best practice is like finding top performers and process experts who will participate in elicitation. • Also, like information gathering in benchmarking, there is information that can be mined from existing internal and external information sources. • It is less expensive to harvest knowledge internally, than to seek external sources. • However, as in benchmarking the needed expertise may exist outside your organization and industry. As knowledge sharing becomes standard practice, Knowledge Harvesting will provide access to these best practices for all processes, regardless of industry, or sector. All of us will have access to these methods via the internet. • The quality professional's role will be to insure the quality standards of the knowledge being harvested and the effectiveness of its extension to others.
Change Management	Apply Adapt	<ul style="list-style-type: none"> • What did you learn about cultural transformation issues that can be recycled? • The basis for CMM culture is inherent in the TQM culture—orientation to continual learning, focus on process, tying intangibles to the bottom line results, etc.
Measurement	Evaluate	<ul style="list-style-type: none"> • The ultimate measurements in CMM are about an organization's ability to manage information, which serves as the basis for personal understanding and action. • In CMM, the critical things to measure are speed, clarity, retrieve-ability, re-usability, extend-ability, and innovation
Process Management and Re-engineering <ul style="list-style-type: none"> • Analysis, mapping, descriptions of work processes • Flowcharting 	Elicit Optimize Adapt	<ul style="list-style-type: none"> • As with reengineering, there is a goal of elegance, the ability to simplify and accomplish more work with the same resources.
Standards & Certification <ul style="list-style-type: none"> • Recognition by ASQ that an individual has demonstrated proficiency and comprehension of a specified body of knowledge at a point in time. 	Apply	<ul style="list-style-type: none"> • Compliance with domestic or international standards (ISO 9000, QS 9000, or ISO 140000, etc.) form the basis for establishing protocols for electronic knowledge transfer activities • Record keeping is key in quality improvement activities. Institutionalizing the discipline of document management will be critical to successful CMM • As measures for CMM are formalized, standards for knowledge management can be developed

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Customer satisfaction <ul style="list-style-type: none"> Data collection and review of customer expectations, needs, requirements, and specifications 	Elicit	<ul style="list-style-type: none"> Quality function deployment, concept engineering, and concurrent engineering established protocols for gathering customer data, analyzing it, and developing product specifications to delight customers. CMM can create systems to make such information available throughout the organization, and provide the means for continual refreshing by all those who are in contact with your customers.
General Knowledge <ul style="list-style-type: none"> Quality philosophies—Juran, Deming, Taguchi, Ishikawa Benefits of quality Quality concepts, terms, and definitions Project management skills 	All CMM actions	<ul style="list-style-type: none"> How do the philosophies serve to help people transition from awareness to understanding to action? How can you transfer the lessons of implementing process focus and non-financial performance measures Consider the similarities of PDCA as a learning cycle for continuous improvement to the Wheel of Actions in CMM and apply what you have learned about teaching PDCA to the implementation of CMM
People and teams <ul style="list-style-type: none"> Motivation theories and principles Barriers to the implementation or success of quality improvement efforts Organization and implementation of various types of quality teams Principles of team leadership and facilitation Team dynamics management, including conflict resolution 	Elicit Apply Adapt	<ul style="list-style-type: none"> In quality improvement, the one who does the work is understood as the best one to improve it. In CMM, capturing that process knowledge so that it can be transferred easily to others is the key. What people know about what they do and its results comprise the key knowledge assets of the organization Apply what has been learned in building teams and sharing learning to the creation of knowledge assets and the implementation of CMM practices throughout the organization Relevant lessons include experience in collaboration, creativity, accountability, and impact on hierarchy of team-based cultures Network structures enhance knowledge sharing and emerge more easily from team-based environments
Safety & Reliability	Elicit Share Apply	<ul style="list-style-type: none"> Provide specific examples of how sharing best practices and applying continuous improvement methods resulted in higher safety and reliability
Cost of Quality <ul style="list-style-type: none"> QCD 	Evaluate	<ul style="list-style-type: none"> As corporate memory expands, the cost of creating knowledge assets decreases, and the time to learn and apply decreases
Tools of Continuous Improvement <ul style="list-style-type: none"> Quality tools New management tools Brainstorming Japanese manufacturing methods (TQM, JIT, QFD, Hoshin, etc.) 	Apply Elicit	<ul style="list-style-type: none"> Selection and use of automated (computerized) tools for capturing information about the management processes and results. There are numerous KM oriented tools that are popping up in the marketplace. Other pertinent tools like workflow and electronic performance support systems are relevant here Cause and effect diagrams and statistical tools will have a role in measuring and adapting CMM activities
Quality Systems <ul style="list-style-type: none"> Elements of a quality system Scope and objectives of quality information systems Techniques for ensuring data accuracy and integrity Management systems for improving quality—policy deployment, continuous improvement strategies Quality documentation systems Problem identification, analysis, reporting, and corrective action system 	CMM	<ul style="list-style-type: none"> Overall CMM is similar to TQM—what are the pitfalls and perils of implementing TQM and how can they serve as a basis for installing CMM? What rules can be developed for managing information technology and identifying software applications to maximize knowledge assets? Can quality documentation systems be adapted for use in CMM? CMM can provide the means for large-scale dissemination of the quality systems themselves

Conclusion

We have purposely avoided detailed discussion of the issues of information technology in knowledge management. This is not because technology is an insignificant aspect of the discussion, obviously, but because it is an enabler for successful knowledge management as much as a catalyst for its emergence. Only by understanding the fundamental principles of knowledge management and articulating a methodology and tools for managing knowledge will technology be able to support individuals and organizations in achieving their purpose. In continuous quality

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improvement, applying technical solutions to process problems before the problems are understood and effective solutions discovered will only speed up the creation of waste and defects. So, too, in knowledge management effective methods for identifying, organizing, and transferring knowledge must be established before technology can become a part of the solution. CMM can become an effective solution to information overload, wasted human resources, redundancy in the workplace, and lack of corporate memory. Quality professionals are in an ideal position to lead their organizations to successful implementation of knowledge management methods and tools and to insure the creation of high quality knowledge assets by understanding and implementing the fundamental actions of Corporate Memory Management.