PMP® Exam Quality Primer: The Quality Gurus

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Quality as we know it today is an accumulation of several concepts that together create a comprehensive approach to quality. The views of quality, as described in the *PMBOK Guide*® and tested on the PMP exam are focused primarily on three major contributors to quality: W. Edward Deming, Joseph M. Juran, and Philip B. Crosby. Though much of the knowledge necessary to pass the PMP exam is readily documented in the *PMBOK Guide*® and other study guides, it may be helpful to have a primer on the quality gurus and programs on which the quality concepts are based.

W. Edward Deming

Many consider Deming the father of quality. His contributions to quality management have been most influential, so much so that he is considered an internationally acclaimed expert. The offerings for which Deming is most widely known are the Deming Cycle, his Fourteen Points, and the Seven Deadly Diseases.

The Deming Cycle

The Deming Cycle was developed to link the production of a product with consumer needs and focus the resources of all departments (research, design, production, and marketing) in a cooperative effort to meet those needs. The Deming Cycle proceeds as follows:

1. **Plan:** Conduct consumer research and use it in planning the product.
2. **Do:** Produce the product.
3. **Check:** Check the product to make sure it was produced in accordance with the plan.
4. **Act:** Market the product.
5. **Analyze:** Analyze how the product is received in the marketplace in terms of quality, cost, and other criteria.

Deming's Fourteen Points

Another Deming contribution, the Fourteen Points, summarized his views on what a company must do to effect a positive transition from business as usual to world-class quality. Deming's Fourteen Points are as follows:

1. Create consistency of purpose toward the improvement of products and services in order to become competitive, stay in business, and provide jobs.
2. Adopt the new philosophy. This is a new economic age; management must recognize this fact and awaken to the challenge, learn their responsibilities, and take on leadership for change.
3. Stop depending on inspection to achieve quality. Build quality from the start.
4. Stop rewarding contracts on the basis of low bids.
5. Improve continuously and forever the system of production and service to improve quality and productivity, and thus constantly reduce costs.
6. Institute training on the job.
7. Institute leadership. The purpose of leadership should be to help people and technology work better.
8. Drive out fear so that everyone may work effectively.
9. Break down barriers between departments so that people can work as a team.
10. Eliminate slogans, exhortations, and targets for the workforce. They create adversarial relationships.
11. Eliminate quotas and management by objectives. Substitute leadership.

12. Remove barriers that rob employees of their pride of workmanship.
13. Institute a vigorous program of education and self-improvement.
14. Make everyone responsible for the transformation and put everyone to work on it.

Deming's Seven Deadly Diseases

Deming's Seven Deadly Diseases summarizes the factors that he believes can inhibit the transformation that the Fourteen Points can bring about. The Seven Deadly Diseases are:

1. Lack of constancy of purpose to plan products and services that have a market sufficient to keep the company in business and provide jobs
2. Emphasis on short-term profit; short-term thinking that is driven by a fear of unfriendly takeover attempts and pressure from bankers and shareholders to produce dividends
3. Personal review systems for managers and management by objectives without providing methods or resources to accomplish objectives; includes performance evaluations, merit rating, and annual appraisals
4. Job-hopping by managers
5. Using only visible data and information in decision making with little or no consideration give to what is not known or cannot be known
6. Excessive medical costs
7. Excessive costs of liability driven up by lawyers who work on contingency fees

Joseph M. Juran

Joseph M. Juran ranks close to Deming in terms of significant contributions to the quality movement. Juran has been most recognized as the person who added the human dimension to quality, broadening it from its statistical origins. Juran is best known for his Three Basic Steps to Progress, his Ten Steps to Quality Improvement, and the Juran Trilogy.

Juran's Three Basic Steps to Progress

The Three Basic Steps to Progress are broad steps that Juran feels companies must take if they are to achieve world-class quality. The Three Basic Steps are as follows:

1. Achieve structured improvements on a continual basis with dedication and a sense of urgency.
2. Establish an extensive training program.
3. Establish commitment and leadership on the part of higher management.

Juran's Ten Steps to Quality

1. Build awareness of both the need for improvement and opportunities for improvement.
2. Set goals for improvement.
3. Organize to meet the goals that have been set.
4. Provide training.
5. Implement projects aimed at solving problems.
6. Report progress.
7. Give recognition.
8. Communicate results.
9. Keep score.
10. Maintain momentum by building improvement into the company's regular systems.

The Juran Trilogy

The Juran Trilogy summarizes the three primary functions of managers: quality planning, quality control, and quality improvement. Each primary function has several steps.

1. Quality planning

1. Determine who the customers are.
2. Identity customer needs.
3. Develop products with features that respond to customer needs.
4. Develop systems and processes that allow the organization to produce these features.
5. Deploy the plans to operational levels.

2. Quality control

1. Assess actual quality performance.
2. Compare performance with goals.
3. Act on differences between performance and goals.

3. Quality improvement

1. The improvement of quality should be ongoing and continual.
2. Develop the infrastructure necessary to make annual quality improvements.
3. Identify specific areas in need of improvement, and implement improvement projects.
4. Establish a project team with responsibility for completing each improvement project.
5. Provide teams with what they need to be able to diagnose problems to determine root causes, develop solutions, and establish controls that will maintain gains made.

Philip B. Crosby

Crosby simply defines quality as conformance. He's known best for his advocacy of zero defects management and prevention as opposed to a statistically acceptable level of quality. He is also known for his Quality Vaccine and Crosby's Fourteen Steps to Quality Improvement.

Crosby's Quality Vaccine

Crosby's Quality Vaccine consists of three ingredients:

1. Determination
2. Education
3. Implementation

Crosby's Fourteen Steps to Quality Improvement

1. Make it clear that management is committed to quality for the long term.
2. Form cross-departmental quality teams.
3. Identify where current and potential problems exist.
4. Assess the cost of quality and explain how it is used as a management tool.
5. Increase the quality awareness and personal commitment of all employees.
6. Take immediate action to correct problems identified.
7. Establish a zero defect program.
8. Train supervisors to carry out their responsibilities in the quality program.
9. Hold a Zero Defects Day to ensure all employees are aware there is a new direction.
10. Encourage individuals and teams to establish both personal and team improvements.
11. Encourage employees to tell management about obstacles they face in trying to meet quality goals.
12. Recognize employees who participate.
13. Implement quality controls to promote continual communication.
14. Repeat everything to illustrate that quality improvement is a never-ending process.

Other Quality Concepts

ISO 9000

ISO 9000 is an international quality standard for goods and services. ISO stands for the International Organization for Standardization, which is a federation of standards bodies from nations around the world. ISO does not set specifications for quality but rather it sets broad requirements for the assurance of quality and for the involvement of management. As ISO has evolved over the years, it has become more closely aligned with the TQM (Total Quality Management) philosophy; however, it is not all encompassing. ISO is composed of three standards:

1. ISO 9000: 2000 *Quality management systems - Fundamentals and vocabulary*
2. ISO 9001: 2000 *Quality management systems - Requirements*
3. ISO 9004: 2000 *Quality management systems - Guidelines for performance improvements*

Six Sigma

The Six Sigma name comes from the concept of standard deviation, a statistically derived value represented by the lower case Greek letter sigma: σ. The variations of processes and their output products are typically measured in the number of standard deviations from the mean. A good company typically operates between 3 and 4 sigma.

The central core of the Six Sigma concept is a six-step protocol for process improvement. These steps are as follows:

1. Identify the product characteristics wanted by the customer.
2. Classify the characteristics in terms of their criticality.
3. Determine if the classified characteristics are controlled by part and/or process.
4. Determine the maximum allowable tolerance for each classified characteristic.
5. Determine the process variation for each classified characteristic.
6. Change the design of the product, process, or both, to achieve Six Sigma process performance.

SEI CMMI

The SEI (Software Engineering Institute) at Carnegie Mellon University developed the CMM, also known as the SW-CMM (Capability Maturity Model for Software) to serve as a model for organizations to identify best practices useful in helping them increase the maturity of their processes.

The maturity levels that organizations seek range from 0, where the organization has incomplete processes and tasks are not repeatable, to a maturity level of 5, where organizations are optimizing their current processes and continuously seeking improvement. The capability levels are:

0. Incomplete
1. Performed
2. Managed
3. Defined
4. Quantitatively managed
5. Optimizing.

Continuous Process Improvement (CPI)

CPI is a concept that recognizes that the world is constantly changing and any process that is satisfactory today may not provide the same value tomorrow. CPI is a holistic approach that is applicable to projects because it supports quality goals by making gradual improvements in

processes and sub-processes that tend to repeat themselves over several projects, or often within a project. The CPI procedure is as follows:

1. **Define and standardize (sub)processes:** Document current understanding; maintain and update formal standards; measure performance against current standards.
2. **Assess (sub)process performance:** Measure process; assess performance against goals and customer needs; select improvement targets.
3. **Improve (sub)processes:** Use teams for shared processes; pursue individual improvement; follow improvement cycle (similar to the Deming Plan-Do-Check-Act cycle) of
    - Standardize
    - Do
    - Check
    - Act
4. **Measure progress:** Measure performance against goals and standards; evaluate customer satisfaction, evaluate method and document results; continuously improve.

Total Quality Management (TQM)

TQM consists of continuous improvement activities involving everyone in the organization, managers and workers, in a totally integrated effort toward improving performance at every level. This improved performance is directed toward satisfying such cross-functional goals as quality, cost, schedule, mission need, and suitability. TQM integrates fundamental management techniques, existing improvement efforts, and technical tools under a disciplined approach focused on continued process improvement. The activities are ultimately focused on increased customer and user satisfaction.

About the author

Samuel Brown, PMP, is a course developer and instructor for Global Knowledge with 25 years experience teaching. In addition, he has provided project management consulting services for a variety of clients including GE, Glaxo Smith-Klein, Bristol-Myers Squibb, Michelin Tire, and IBM.

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