Chapter 8

# PROJECT QUALITY MANAGEMENT

## Chapter Summary

Many news headlines regarding the poor quality of information technology projects demonstrate that quality is a serious issue. Several mission-critical information technology systems have caused deaths, and quality problems in many business systems have resulted in major financial losses.

Customers are ultimately responsible for defining quality. Important quality concepts include satisfying stated or implied stakeholder needs, conforming to requirements, and delivering items that are fit for use.

Project quality management includes planning quality, performing quality assurance, and performing quality control. Quality planning identifies which quality standards are relevant to the project and how to satisfy them. Quality assurance involves evaluating overall project performance to ensure that the project will satisfy the relevant quality standards. Quality control includes monitoring specific project results to ensure that they comply with quality standards and identifying ways to improve overall quality.

There are many tools and techniques related to project quality management. The Seven Basic Tools of Quality include cause-and-effect diagrams, control charts, run charts, scatter diagrams, histograms, Pareto charts, and flowcharts. Statistical sampling helps define a realistic number of items to include in analyzing a population. Six Sigma helps companies improve quality by reducing defects. Standard deviation measures the variation in data. Testing is very important in developing and delivering high-quality information technology products.

Many people contributed to the development of modern quality management. Deming, Juran, Crosby, Ishikawa, Taguchi, and Feigen Baum all made significant contributions to the field. Many organizations today use their ideas, which also influenced Six Sigma principles. The Malcolm Baldrige National Quality Award and ISO 9000 have also helped organizations emphasize the importance of improving quality.

There is much room for improvement in information technology project quality. Strong leadership helps emphasize the importance of quality. Understanding the cost of quality provides an incentive for its improvement. Providing a good workplace can improve quality and productivity.

Understanding Stakeholders expectations and cultural differences are also related to project quality management. Developing and following maturity models can help organizations systematically improve their project management processes to increase the quality and success rate of projects.

There are several types of software available to assist in project quality management. It is important for project teams to decide which software will be most helpful for their particular projects.

## Quick Quiz

1. _____ is the degree to which a set of inherent characteristics fulfils requirements.
    a. Quality
    b. Conformance to requirements
    c. Fitness for use
    d. Reliability

2. What is the purpose of project quality management?
    a. to produce the highest quality products and services possible
    b. to ensure that appropriate quality standards are met
    c. to ensure that the project will satisfy the needs for which it was undertaken
    d. All of the above

3. _____ generates ideas for quality improvements by comparing specific project practices or product characteristics to those of other projects or products within or outside the performing organization.
    a. Quality audits
    b. Design of experiments
    c. Six Sigma
    d. Benchmarking

4. What tool could you use to see if there is a relationship between two variables?
    a. a cause-and-effect diagram
    b. a control chart
    c. a run chart
    d. a scatter diagram

5. What tool can you use to determine whether a process is in control or out of control?
    a. a cause-and-effect diagram
    b. a control chart
    c. a run chart
    d. a scatter diagram

6. Six Sigma s target for perfection is the achievement of no more than _____ defects, errors, or mistakes per million opportunities.
    a. 6
    b. 9
    c. 3.4
    d. 1

7. The seven run rule states that if seven data points in a row on a control chart are all below the mean, above the means, or all increasing or decreasing, then the process needs to be examined for _____ problems.
    a. random
    b. non-random
    c. Six Sigma
    d. quality

8. What is the preferred order for performing testing on information technology projects?
    a. unit testing, integration testing, system testing, user acceptance testing
    b. unit testing, system testing, integration testing, user acceptance testing
    c. unit testing, system testing, user acceptance testing, integration testing
    d. unit testing, integration testing, user acceptance testing, system testing

9. _____is known for his work on quality control in Japan and developed the 14 Points for Management in his text *Out of the Crisis*.
    a. Juran
    b. Deming
    c. Crosby
    d. Ishikawa

10. PMI s OPM3 is an example of a model or framework for helping organizations improve their processes and systems.

a. benchmarking
b. Six Sigma
c. maturity
d. quality

## Key Terms

**5 whys —** a technique where you repeatedly ask the question "Why?" (five is a good rule of thumb) to help peel away the layers of symptoms that can lead to the root cause of a problem

**Acceptance decisions —** decisions that determine if the products or services produced as part of the project will be accepted or rejected

**Appraisal cost —** the cost of evaluating processes and their outputs to ensure that a project is error-free or within an acceptable error range

**Benchmarking—** a technique used to generate ideas for quality improvements by comparing specific project practices or product characteristics to those of other projects or products within or outside the performing organization

**Capability Maturity Model Integration (CMMI)—** a process improvement approach that provides organizations with the essential elements of effective processes

**Cause-and-effect diagram —** diagram that traces complaints about quality problems back to the responsible production operations to help find the root cause. Also known as *fishbone diagram* or *Ishikawa diagram*

**Conformance —** delivering products that meet requirements and fitness for use

**Conformance to requirements —** the project processes and products meet written specifications

**Control chart —** a graphic display of data that illustrates the results of a process over time

**Cost of nonconformance —** taking responsibility for failures or not meeting quality expectations

**Cost of quality —** the cost of conformance plus the cost of nonconformance

**Defect—** any instance where the product or service fails to meet customer requirements

**DMAIC (Define, Measure, Analyze, Improve, Control) —** a systematic, closed-loop process for continued improvement that is scientific and fact based

**Design of experiments —** a quality technique that helps identify which variables have the most influence on the overall outcome of a process

**External failure cost—** a cost related to all errors not detected and corrected before delivery to the customer

**Features —** the special characteristics that appeal to users

**Fishbone diagram —** diagram that traces complaints about quality problems back to the responsible production operations to help find the root cause. Also known as *cause-and effect diagram* or *Ishikawa diagram*