Introduction to Project Quality Management

Project quality management is the combination of two fields: quality management and project management. Many factors—such as external global competitiveness, dynamic environmental changes, increased task complexity, and internal productivity improvement—have driven the parallel and separate evolution of quality management and project management. Superior quality and project management optimize the performance excellence of organizations, but their combined leverage is often underutilized. Quality processes can be used to improve project performance. Leaders who master project quality management will have greater success both on individual projects and on a portfolio of projects for their organizations.

An introduction to project quality management requires a basic understanding of: (1) the histories of the quality management and project management fields; (2) the conceptual foundations of project quality management; and (3) the need for improvement in project quality management.

BRIEF HISTORIES OF QUALITY AND PROJECT FIELDS

The histories of quality management and project management provide a context for understanding their interrelationships.

History of Quality Management

Before the Industrial Revolution, skilled craftspeople made and inspected their own limited number of products and took pride in their holistic workmanship before selling to their customers. After the Industrial Revolution, unskilled workers were employed in an assembly-line manufacturing system that valued quantity of output, specialization of labor, and separation of worker from customer. Nevertheless, concern for efficient quality control persisted because military and civilian customers objected to substandard product variations, such as weapons that did not function in combat and telephones that did not function in the home.

To address civilian concerns about variation in telephone service in the 1920s, Walter Shewhart's team at Bell Telephone Laboratories developed new

theories and statistical methods for assessing, improving, and maintaining quality. Control charts, acceptance sampling techniques, and economic analysis tools laid the foundation for modern quality assurance activity and influenced the work of W. Edwards Deming and Joseph M. Juran.

After World War II, Deming and Juran introduced *statistical quality control* to the Japanese as part of General MacArthur's industrial base rebuilding program. They convinced top Japanese leaders that continually improving product quality through reducing statistically measured variation would open new world markets and ensure Japan's national future. From the 1950s to the 1970s, the Japanese improved the quality of their products at an unprecedented rate while Western quality standards remained stagnant. The Japanese were culturally assisted by the Deming Prize, which was instituted in 1951 by the Union of Japanese Scientists and Engineers (JUSE) to nationally recognize individuals and organizations that documented performance improvements through the application of company-wide quality control (CWQC). Starting in the late 1970s, the Japanese captured significant global market shares of the automobile, machine tool, electronics, steel, photography, and computer industries, in large part due to the application of quality management processes.

In a belated response to this quality-based, competitive threat from Japan, many U.S. organizations engaged in extensive quality improvement programs in the 1980s. In 1987—some 34 years after Japan created the Deming Prize—Congress established the Malcolm Baldrige National Quality Award (MBNQA), which provided a framework of seven categories (leadership, strategic planning, customer and market focus, information and analysis, human resource focus, process management, and business results) to promote quality management practices that lead to customer satisfaction and business results. In 1987 as well, the International Organization for Standardization (ISO) adopted written quality system standards (the ISO 9000 family of standards) for European countries and those seeking to do business with those countries, and later enacted a registration procedure. These design, development, production, installation, and service standards have been adopted in the United States by the American National Standards Institute (ANSI) with the endorsement and cooperation of the American Society for Quality (ASQ). In 1991, the European Foundation for Quality Management (EFQM), in partnership with the European Commission and the European Organization for Quality, announced the creation of the European Quality Award to signal the importance of quality in global competition and regional productivity.

The integration of these quality approaches at all organizational levels was referred to as Total Quality Management (TQM) in the 1990s and continues today, along with a recent emphasis on bottom-line, focused Six Sigma quality—a level of quality representing no more than 3.4 defects per million process opportunities.

History of Project Management

At the same time that quality management was developing, many events led to the need for better project management. While projects have occurred throughout history (for example, Egyptian pyramid construction projects, Chinese garden design projects, Roman road construction projects), the need for a systematic field of study emerged in the middle of the twentieth century in the United States. In the 1950s and 1960s, task complexity in dynamic environments in the defense, aerospace, construction, high-technology engineering, computer, and electronic instrumentation industries demanded formal project management skills at many levels. Previously, project management had been ad hoc at best. Now the need to address cost, schedule, scope, and quality concerns simultaneously forced companies and government organizations to develop more systematic and standard approaches.

In 1969, the Project Management Institute was formed to act as a forum for the discussion and exchange of project management experiences in different industries. In the 1970s and 1980s, the wide range of factors that prompted formal project management techniques surfaced: size of the undertaking beyond traditional functional resources, unfamiliarity of diverse efforts (e.g., crisis situations, takeover threats, major reorganizations), rapid market changes that put a premium on flexible, timely responsiveness, the interdependence and resource sharing necessary for the simultaneous engineering of new product innovations, and ad hoc team cooperation necessary to capitalize on a unique opportunity in conditions of uncertainty.

In 1981, the Project Management Institute formally recognized the development of uniform standards for management of projects as its responsibility and in 1987 it published *A Guide to the Project Management Body of Knowledge* (*PMBOK® Guide*). Throughout all updated versions of the *PBMOK® Guide*, project quality management has been recognized as a separate, core knowledge area. Individuals who master the *PMBOK® Guide* and pass certification testing become Certified Project Management Professionals (PMP®).

Other trends in the 1980s and 1990s increased support for project management skills. For example, project management teams were used to implement quality management process improvements, concurrent engineering required better scheduling techniques, decentralized change management and risk management decisions in restructured firms highlighted the contribution of the field project manager as opposed to the traditional middle manager, and the distinctive needs of co-located and multinational teams on ad hoc assignments favored project management structures. In addition, the expansion of project-driven techniques from divisions such as management information systems (MIS) and research and development (R&D) to marketing and engineering has pressured many organizations to shift from traditional, long-lived product management structures to more flexible, short-lived project management structures.

CONCEPTUAL FOUNDATIONS OF PROJECT QUALITY MANAGEMENT

To understand these modern approaches in managing project quality, one must first understand the conceptual foundations of both quality management and project management. We cover those foundations next, followed by the four major project quality pillars that emerge from the conceptual foundations: (1) customer satisfaction; (2) process improvement; (3) fact-based management; and (4) empowered performance.

Conceptual Domain of Quality Management

One of the earliest approaches to project quality management occurred in ancient Babylon. During Hammurabi's rule, if a building collapsed, the architect and builder were both put to death. Fortunately, in modern times we focus more on preventing problems than claiming retribution if problems occur.

Quality has been defined as "the totality of characteristics of an entity that bear on its ability to satisfy stated or implied needs."[1] The stated and implied quality needs are inputs into devising project requirements. However, quality and grade are not the same. According to the *PMBOK® Guide*, grade is "a category or rank given to entities having the same functional use but different technical characteristics."[2]

Quality is a focus of project management. For example, a multimedia software program may be of high quality (no operational dysfunctions and an accurate accompanying manual) but be a low grade (a limited number of

extra features). The mix of quality and grade is a responsibility of the project manager and his/her team.

Customer quality expectations in the manufacturing sector typically include the following factors:[3]

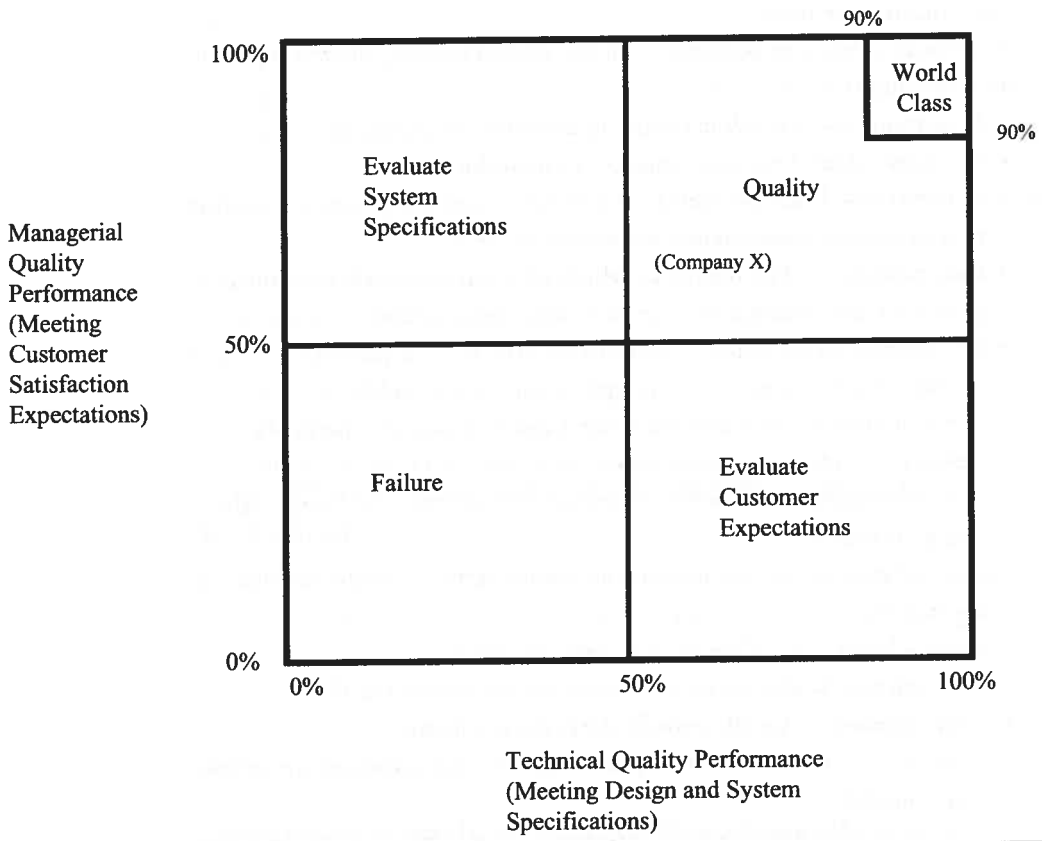
- Performance – A product's primary operating characteristics
- Features – The "bells and whistles" of a product
- Reliability – The probability of a product surviving over a specified period of time under stated conditions of use
- Conformance – The degree to which physical and performance characteristics of a product match pre-established standards
- Durability – The amount of use one gets from a product before it physically deteriorates or until replacement is preferable
- Serviceability – The ability to repair a product quickly and easily
- Aesthetics – How a product looks, feels, sounds, tastes, or smells
- Perceived quality – Subjective assessment resulting from image, advertising, or brand names.

Customer quality expectations in the service sector typically include the following factors:

- Time – How much time must a customer wait?
- Timeliness – Will a service be performed when promised?
- Completeness – Are all items in the order included?
- Courtesy – Do front-line employees greet each customer cheerfully and politely?
- Consistency – Are services delivered in the same fashion for every customer, and every time for the same customer?
- Accessibility and convenience – Is the service easy to obtain?
- Accuracy – Is the service performed right the first time?
- Responsiveness – Can service personnel react quickly and resolve unexpected problems?

Since meeting or exceeding customer expectations and conforming to system design and specifications are crucial to quality, the analytical framework offered by the quality performance grid (see Figure 1-1) is helpful in depicting the relative parameters of achieved quality. In the grid, the vertical axis represents managerial performance quality with respect to meeting customer satisfaction expectations. The horizontal axis represents technical performance quality with respect to meeting design and system specifications. World-class quality requires high level (90 percent) mastery of both managerial and technical skills. Less than 50 percent success in either

FIGURE 1-1 Quality Performance Grid



meeting customer satisfaction expectations and/or meeting design and system specifications is considered a quality performance failure.[4]

Company X is shown as an example. Company X has satisfactory performance in both dimensions, but is far from world class. This quality performance grid can be used to ensure that a company is performing satisfactorily on both the managerial and technical dimensions of quality. It can also be used to identify where more effort is needed.

The *cost of poor quality* is the total amount of money a company spends to prevent poor quality (i.e., to ensure and evaluate that the quality requirements are met) plus any other costs incurred as a result of poor quality being produced.[5] Poor quality can be defined as waste, errors, or failure to meet customer needs and system requirements.

The costs of poor quality can be broken down into the three categories of prevention, appraisal, and failure costs.

- **Prevention costs:** These are planned costs an organization incurs to ensure that errors are not made at any stage during the delivery process of that product or service to a customer. The delivery process may include design, development, production, and shipping. Examples of prevention costs include quality planning costs, information systems costs, education and training costs, quality administration staff costs, process control costs, market research costs, field testing costs, and preventive maintenance costs. The costs of preventing mistakes are always much less than the costs of inspection and correction.
- **Appraisal costs:** These include the costs of verifying, checking, or evaluating a product or service during the delivery process. Examples of appraisal costs include receiving or incoming inspection costs, internal production audit costs, test and inspection costs, instrument maintenance costs, process measurement and control costs, supplier evaluation costs, and audit report costs.
- **Failure costs:** A company incurs these costs because the product or service did not meet the requirements and had to be fixed or replaced, or the service had to be repeated. These failure costs can be further subdivided into two groups: internal or external failures.

  Internal failures include all costs resulting from the failures found before the product or service reaches the customer. Examples include scrap and rework costs, downgrading costs, repair costs, and corrective action costs from nonconforming product or service.

  External failures occur when the customer finds the failure. External failure costs do not include any of the customer's personal costs. Examples of these failure costs include warranty claim costs, customer complaint costs, product liability costs, recall costs, shipping costs, and customer follow-up costs.

Conceptual Domain of Project Management

Understanding the concepts of quality management is important as a basis for learning project quality management. Now we look briefly at the basics of project management. *Projects* are defined in the *PMBOK® Guide* as "temporary endeavors undertaken to create a unique product or service."[6] The objectives of projects and operations are fundamentally different from a timing perspective. The focus of the project is to quickly achieve the objective and then terminate. The objective of an ongoing non-project operation is to sustain itself and the organization indefinitely.

A successful project is one that meets at least four criteria: schedule, budget, performance, and customer satisfaction. In other words, successful projects are those that come in on time, on budget, perform as expected by conforming to design specifications, and satisfy customers.

Since the 1980s and 1990s, project managers and their teams have been used to implementing quality management process improvements by relying on project lifecycles. While there are a variety of generic project lifecycle models, the authors have developed a new *five-stage project quality process model*, presented in Figure 1-2. The first and last stages are not currently in the *PMBOK® Guide*, but are crucial to project quality success and parallel other *PMBOK® Guide* recommendations for other core knowledge areas.[7]

The five stages are:

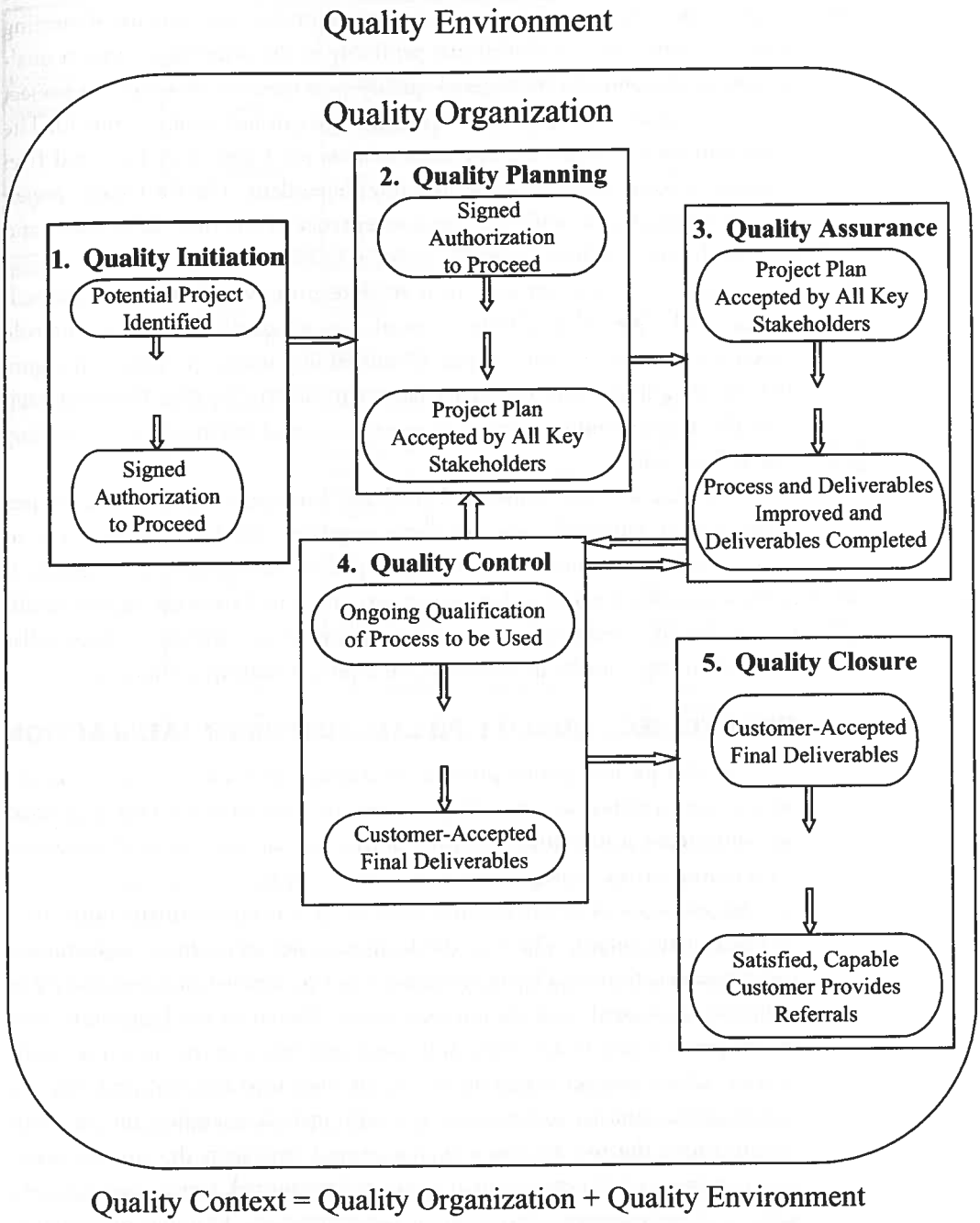
1. Project quality initiation
2. Project quality planning
3. Project quality assurance
4. Project quality control
5. Project quality closure.

We believe this five-stage model is the simplest generic model that can be used to show when, why, and how critical quality management techniques can be effectively used to help ensure project success. We believe that all five stages are needed, even though some managers frequently shortchange one or two of them. We also believe that this model can be used for projects in any industry. Additional or more detailed quality management techniques may be needed in some industries and on large, complicated projects in any industry. We believe that managers of even the smallest, simplest projects should understand the need for all five stages and the quality management techniques we suggest for each. If a manager wants to use a streamlined approach on a simple project, that is fine—as long as he or she accomplishes the spirit of the techniques shown.

In our five-stage project quality process model, we show the relationships between each stage. For simplicity, we are showing only the starting and ending points of each stage. In the following chapters we will show and discuss the many activities that should occur during each stage.

The first stage, *project quality initiation*, begins with the identification of a potential project and ends with a signed authorization to proceed. The second stage, *project quality planning*, begins with the signed authorization to proceed and ends with the acceptance of the project plan by stakeholders. The third stage, *project quality assurance*, begins with the acceptance of the project plan by stakeholders and ends with processes and deliverables improved to

FIGURE 1-2 Five-Stage Project Quality Process Model



the point of completion. The fourth stage, *project quality control*, begins with the ongoing qualification of processes used and ends with client acceptance of the final deliverables. Hence, the technical quality performance of meeting project design specifications occurs primarily in the third stage (project quality assurance) and the managerial quality performance of satisfying project customers occurs primarily in the fourth stage (project quality control). The third and fourth stages are not sequential as are stages one, two, and five; they are dynamically interactive and interdependent. The fifth stage, *project quality closure*, begins with the client acceptance of the final deliverables and ends with referrals from a capable, satisfied customer.

Leaders of organizations need to determine who will perform each project task. We show a typical set of project quality management role assignments in the project lifecycle accountability matrix presented in Figure 1-3. While a leader will use many factors to determine who performs each task, this accountability matrix can serve as a useful starting point in making role assignments.

Now that we have considered the basic concepts of quality and project management separately, we put them together. We feel the best way to understand the combined field of project quality management is to describe it as the sum of four pillars: (1) customer satisfaction, (2) process improvement, (3) fact-based management, and (4) empowered performance.[8] Each pillar must be strong to hold up the project as a pillar holds up a building.

FIRST PROJECT QUALITY PILLAR: CUSTOMER SATISFACTION

The first project quality pillar is the strategic priority accorded customer satisfaction, which is achieved by customer-focused work systems supported by committed leadership. Meeting both external and internal customer expectations drives strategic efforts in a quality firm.

For purposes of clarification, a number of conceptual distinctions must be made at the outset. The first clarification is between project stakeholders and project customers. *Project stakeholders* can be defined as those directly or indirectly associated with the project, those affected in the long/short term by the project and its activities, and those interested in the outcome of the project. Often project stakeholders are divided into internal and external stakeholders. Internal stakeholders typically include members of the home organization: the project sponsor, the project manager, the project team, top management, functional managers, staff personnel, service and support, other project managers, and internal subcontractors. External stakeholders typically include: customers/clients, suppliers, distributors, regulatory agen-

FIGURE 1-3 Project Lifecycle Accountability Matrix

Role\Stage	Project Quality Initiation	Project Quality Planning	Project Quality Assurance	Project Quality Control	Project Quality Closure
Sponsor	Select project manager, align and select project, commit to charter	Determine decision-making authority, commit to plan	Conduct external customer communications, mentor project manager, and clear obstacles as needed	Conduct external customer communications, mentor project manager, and clear obstacles as needed	Recognize and reward participants, assess project to improve system
External Customer	Identify and prioritize expectations, commit to charter	Identify customer satisfaction standards and tradeoff values, commit to plan	Conduct ongoing communications	Confirm ongoing satisfaction level, accept deliverables	Verify when training and support are complete, assess project to improve system
Project Manager	Select core team, identify risks, empower performance, commit to charter	Identify customer satisfaction standards and tradeoff values, develop quality and communications plans, commit to plan	Conduct external customer communications, confirm qualified processes used, manage quality audits and planning	Measure customer satisfaction, manage process improvements	Recognize and reward participants, assess project to improve system
Core Team	Determine team operating principles, flowchart project, identify lessons learned, commit to charter	Plan project, identify suppliers, qualify the process, identify data to collect, commit to plan	Use qualified processes, gather data, find root causes, conduct quality audits, plan future work	Measure customer satisfaction, test deliverables, correct defects, endorse deliverables	Provide customer support and training, assess project to improve system

cies, social and cultural environment, economic and financial environment, political and legal environment, external contractors and competitors, media and public interest groups, and the natural ecological environment.

Project customers are the direct purchasers, end users, and providers of products and services. Project customers are also both internal and external. The external customer is usually accorded highest priority in quality organizations; nevertheless, internal home organization customers must also be satisfied.

We will adopt the conventional phrase *key project stakeholders* to refer to that mix of internal and external direct purchasers, consumers, and providers referred to as *customers.* It is, therefore, customers or key project stakeholders who must be satisfied for the first project quality pillar to be established. It is advisable to satisfy as many additional stakeholders as possible to prevent any unwarranted project disruption.

Distinctions about the nature of satisfaction also need to be addressed. Distinctions have been made among product characteristics as being *dissatisfiers, satisfiers,* and *exciters/delighters.* Dissatisfiers are unstated customer expectations for the product or service that are taken for granted and, if absent, result in customer dissatisfaction with products. Satisfiers are stated customer expectations about the product or service, which, if fulfilled, lead to product satisfaction. Exciters/delighters are unstated and unexpected consumer desires for products or services which, if met, lead to high perceptions of quality and likely purchase or repurchase of products.

Over time, exciters/delighters become satisfiers as customers become used to them, and eventually satisfiers become dissatisfiers. This means that systemic strategic planning and leadership are required to ensure that ongoing customer satisfaction is delivered as customer expectations increase.

A *work system* can be defined as a set of functions or activities within an organization that interact to achieve organizational goals. To engage in systemic strategic planning requires that leaders understand the interrelationships among all subsystem parts and the people who work in them. Deming specifically emphasizes that the leader's primary responsibility is to optimize the quality system so that customer satisfaction will result. By supporting projects that are best for one manager's career or for a highly vocal group, the leader suboptimizes. *Suboptimization* results in a net loss for the organization by diverting resources from system-aligned projects to marginal projects.

For example, a project manager and his/her team in the purchasing department may recommend the purchase of new materials at the lowest bid to cut costs. Inexpensive materials may be inferior in quality. This might cause excessive costs in later corrections during manufacturing. Although the purchasing project leader and team may look good on paper, the entire system will suffer. Therefore, an important responsibility of the committed quality leader is to ensure that only system-aligned projects are sponsored and completed in order to prevent suboptimization.

Quality strategic planning is the organizational design and structure that produces total customer satisfaction. Strategic planning results in both customer satisfaction *goals* (non-quantified aspirations) and customer satisfaction *objectives* (which determine what is to be accomplished by when in quantified terms).

Now that we understand who the various project customers are, what delights and satisfies them, and how to use strategic planning to best satisfy our mix of customers, we turn to our next project quality pillar.

SECOND PROJECT QUALITY PILLAR: PROCESS IMPROVEMENT

The second project quality pillar is the continual (includes both continuous and discontinuous) improvement of work processes to efficiently and effectively achieve the strategic goal of customer satisfaction. A *work process* can be defined as any set of linked activities that takes an input, adds value to it, and provides an output to an internal or external customer. Thus, a set of processes may together form a quality system. The quality system in turn provides the organizational operational context for team projects and individual task performances.

Ongoing process improvement results in three types of quality improvement: incremental cost reduction, competitive parity, and breakthrough dominance. All three types of improvement are important and each is appropriate in certain circumstances. Any given project is likely to use one or more of these types of improvement.

The first type, *incremental cost reduction* (sometimes referred to as *kaizen*), is the process improvement approach that constantly and gradually cuts costs and involves every organizational member in order to maintain the existing system more efficiently. An example is to reduce the number of steps in a process without sacrificing quality.

The second type, *competitive parity*, is the process improvement approach that abruptly and dramatically matches the performance of the best-in-class of external competitors. Strategic planners and key process champions usually drive this type of improvement; it may entail scrapping the existing system and rebuilding to catch up with the best-of-class. An example is Microsoft rebuilding its processes to match Internet competitors.

The third type, *breakthrough dominance*, is the process improvement approach that involves quantum leaps to outdistance the competition and revolutionarily restructure or reengineer new processes. Usually, strategic leadership, R&D management, and process change champions drive this type of improvement. It may entail starting over and creating a new system from scratch. An example is the radical redesign of jet engines to surpass propeller-driven aircraft.

Furthermore, process improvement entails *process qualification* determinations, as indicated in Figure 1-4. The goal is to move from:

1. The spontaneous level in which little or no process standards are used; through

FIGURE 1-4 Process Qualification Levels

Level 1–Spontaneous: Few or no process standards are used.

- Lack of documentation
- Skills and knowledge uneven
- Inadequate tracking
- Very little use of systems or technical tools
- Process success depends on experience and skills of managers and team

Level 2–Initialized: Process awareness is widespread but ad hoc.

- Non-standard methods and approaches widely used, everyone performs differently
- Some documented procedures (what needs to be done but not how to do it)
- Some data collection and documentation
- Technical tools used but not always in a full or correct manner
- All processes attempt to follow some basic functionality

Level 3–Formalized: Basic processes are standardized and institutionalized.

- Company-wide standards developed and documented for all basic processes to maintain an existing system
- Audited and enforced use of standard processes
- Consistent data collection and reporting across organization
- Lessons learned are shared throughout organization
- Widespread and adequate process specific training to keep current system functioning

Level 4–Optimized: Processes are systematically measured, continually improved, and cross-functionally integrated with business operations.

- Data consistently collected and stored in a database, and extensive evaluation performed for all processes
- Database integrated with company systems to ensure ongoing improvement
- Mechanisms established for continuous process improvement
- Innovative ideas pursued and organized to improve processes and documentation
- Goes beyond process success, emphasizes success of people and systems

2. The initialized level in which non-standard approaches are widely used; also through
3. The formalized level in which standards are institutionalized; and finally to

4. The optimized level in which improvement and integration are a way of life.

The four levels of process qualification provide both a multi-level classification scheme for existing processes and a "to-do" list for fact-based project management teams.

THIRD PROJECT QUALITY PILLAR: FACT-BASED MANAGEMENT

The third project quality pillar focuses on the importance of managing by facts rather than managing by power, hunches, or groupthink. To *manage by facts* means that an organization (1) uses quality processes to identify and capture data and trends that determine what is factually true about performance, and (2) structures itself to be responsive to diverse stakeholders that voice the truth. Collecting, measuring, and analyzing data and trends are key responsibilities for project leaders and teams in evaluating and improving processes.

One of the most important skills in fact-based management is knowledge of *statistical variation* in evaluating processes. Processes that include materials, tools, machines, operators, and the environment exhibit complex interactions; properly understanding them requires knowledge of two types of statistical variation.

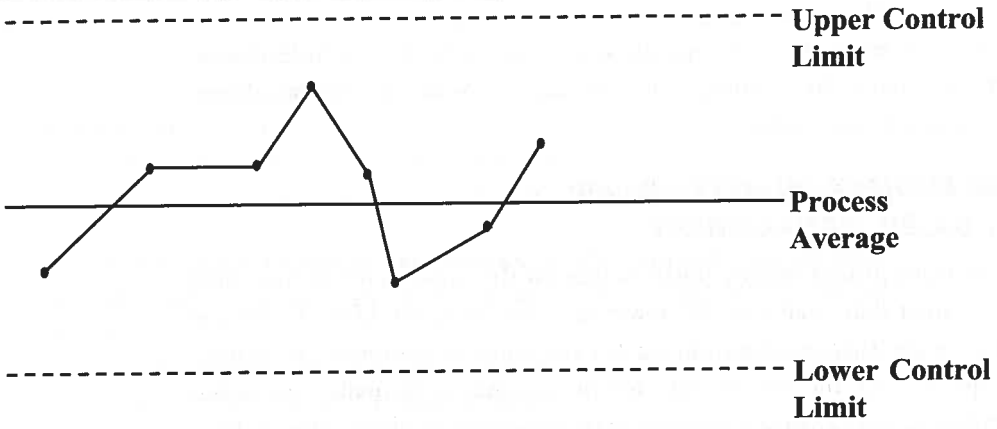
One is *common or random variation*, which is inherent in any process. Multiple small causes are responsible for random variation. A system governed only by common causes is said to be *stable*. To decrease this type of variation one needs to improve the entire system, not just one part.

The second type of statistical variation is *special or assignable variation*. Assignable causes of variation occur when something in the process is different from normal, such as faulty material, an inattentive worker, or a broken tool. The way to reduce assignable causes of variation is to identify and control them as quickly as possible.

Statistical quality control charts (such as in Figure 1-5) are line graphs with center lines and statistically calculated upper and lower control limits used to distinguish between random and assignable cause variation. Work performance differences within the upper and lower control limits are statistically insignificant although they may appear to be important to those not skilled in fact-based management.

Project leaders can make two fundamental mistakes in attempting to improve a process without factual knowledge of its statistical variation. The first mistake is *overcontrol*—treating as a special cause any fault, complaint,

FIGURE 1-5 Project Control Chart



mistake, breakdown, accident, or shortage when it actually came from common cause. Some people call this the Dilbert effect of abusive managerial overcontrol. The second mistake is *undercontrol*—attributing to common causes any fault, complaint, mistake, breakdown, accident, or shortage when it actually comes from a special cause. Examples of undercontrol include neglecting to identify, retrain, or dismiss substandard performers at work.

In the case of overcontrol, interfering with a stable system actually increases variation and harms the system. In the case of undercontrol, project leaders miss the opportunity to eliminate unwanted variation by assuming that it is uncontrollable. Since producers and consumers benefit from reduced variation, project managers and team members need knowledge of statistical variation to properly manage by facts.

Another important group of skills in fact-based management is those necessary to lead and follow in a variety of teams, including cross-functional teams. These skills contrast sharply with those needed merely to respond to hierarchical authority. Leading and following skills are crucial for the decentralized and horizontal management of information streams in the organization. *High-quality project teams* move from initial project awareness, to involvement, to commitment, and finally to project ownership on their own or with the skilled intervention of seasoned project managers. They are successful and rapidly socialize new members into performance norms of cooperative competence and power-sharing.

The third project quality pillar of fact-based management leads right into the fourth pillar: empowered performance.

FOURTH PROJECT QUALITY PILLAR: EMPOWERED PERFORMANCE

The fourth project quality pillar entails the empowered daily work performance of continual improvement in personal tasks aligned with the system and within an employee's scope of responsibility.

Work performance can be defined as behavior associated with the accomplishment of expected, specified, or formal role requirements on the part of individual organization members. Quality organizations may be described in terms of the norms, values, and reward procedures that emphasize the holistic, competent behavior of individuals oriented toward cooperation with fellow organization members.

Work performance in a quality environment includes accomplishing tasks and taking initiatives above and beyond the call of duty, along with sharing information with and helping co-workers. This performance is typically referred to as *organizational citizenship behavior* (OCB). In a total quality organization, OCB is both expected and formally rewarded. Support staff in a quality office will often phone other departments for work if their own department's work has been completed. This cooperative "helping out" attitude is the recognized norm and is routinely celebrated and rewarded.

Individual empowerment has been described as intrinsic task motivation consisting of five dimensions: responsible choice, meaningfulness, competence, proactive learning, and impact. The central component of empowerment is responsible choice—free decisions for which one is responsible. Choice involves taking responsibility for a person's actions. Choice also develops an individual's belief in his/her ability to effect a desired change in the environment. Field research has demonstrated that choice and personal control are related to intrinsic task motivation, job performance, and job satisfaction.

The second dimension, meaningfulness, concerns the value a task holds for the individual. If an individual finds a task meaningful, he or she will be more content performing it. The third dimension, competence, refers to the experientially founded belief that one is capable of successfully performing a particular task or activity. People who believe they can perform the work assigned are more willing workers.

The fourth dimension, proactive learning, is the process of discovering, creating, and/or understanding through feedback between practices and

results. Empowered people are used to and expect feedback. They are not overly sensitive to critical remarks. The fifth dimension, impact, represents the degree to which individuals perceive that their behavior makes a difference.

Project leaders should think about all five dimensions of individual empowerment as they deal with project participants. Often short conversations regarding one or more of these dimensions can help individuals feel more empowered, thereby improving the chances for good quality work on the project.

Individuals usually appreciate organizations that provide them with opportunities for personal control, responsibility, and challenge in their work, and will tend to reciprocate by being more committed to the organization. As individuals demonstrate empowerment readiness in project responsibilities, they develop their sense of self-respect through performance.

Quality firms require respect for all people in the organization, regardless of role, since each person is continually being empowered to enhance the effectiveness of the organization. We now describe several problems that deal with lack of respect.

Individuals who respect others but not themselves are a problem. Unfortunately, these individuals do not relate well to others in a cooperative quality manner because they undervalue their own worth, rarely voice their own opinions, and rely on the approval of others for validation. An example is a project leader or team member who allows others to verbally abuse him/her without setting boundaries for respectful discussion at work.

Another problem concerns individuals who respect themselves but not others. They alienate team members and are unable to learn from others or to generate teamwork. An example is project leaders who do not solicit input or ignore feedback from knowledgeable followers because they (the leaders) are too proud to learn from others.

Yet another lack of respect problem is that some people only feel or show honor for those who have higher rank or status in work organizations and treat peers or direct reports with contempt or neglect. Some people profess respect for others, but act as if they always expect others to defer to their judgment. For example, they often dismiss the contributions of others in conversations and decision-making processes. This gap between the rhetoric and reality of respect for people is what must be—and is—eliminated or severely reduced in a quality organization because the system cannot improve without sincere respect for the integrity of individual contributions.

NEED FOR IMPROVED PROJECT QUALITY MANAGEMENT

Now that we have discussed the conceptual domains of the quality and project management fields and the four project quality pillars, it is easy to see why lack of familiarity with both fields can cause problems. Failure to understand and use both project and quality tools may lead to many problems. First we consider potential problems that may arise if people do not understand the four project quality pillars in general and then we consider potential problems that may arise if people do not understand the activities that are required during each of the five stages of project quality management.

When people do not understand and/or use the first project quality pillar, customer satisfaction, they:

- Do not strategically prioritize customer satisfaction and instead often prioritize short-term financial returns and wonder why they are losing market share
- Do not understand systems so they see events as isolated incidents rather than the net result of many interactions and interdependent forces
- Confuse operational symptoms with deeper dysfunctional system causes
- Sponsor projects that suboptimize resources and thereby dissipate the energy of the firm.

When people do not understand and/or use the second project quality pillar, process improvement, they:

- Regard only the efficient maintenance of status quo operations, rather than additional ongoing process improvement, as the ideal work contribution
- Cannot distinguish between different levels of process qualification so they cannot optimize organizational performance.

When people do not understand and/or use the third project quality pillar, fact-based management, they:

- Overcontrol people who are performing acceptably in a stable system and thereby reduce system productivity and lower morale
- Undercontrol people who are statistically substandard performers and miss opportunities to rid the system of unwanted variation
- Are unable or unwilling to cooperatively engage in cross-functional teamwork to improve processes.

When people do not understand and/or use the fourth project quality pillar, empowered performance, they:

- Engage in workplace avocations that divert their energy into non-aligned activities that waste team and organizational resources
- Spend too much time trying to get individual recognition and never develop the teamwork skills to constructively contribute to collective projects for process improvement
- Do not develop individual empowerment skills and respectful regard for others' competencies so they resort to dominance or victimization rituals that are personally and organizationally counterproductive.

Now we turn our attention to some of the problems that may be encountered when people do not understand the different stages of project quality management. When people do not understand project quality initiation, they

- Endorse suboptimal projects that should not be initiated
- Poorly understand the potential project
- Generate insufficient support.

When people do not understand project quality planning, they:

- Ignore needed inputs and suppliers
- Neglect to qualify project processes
- Do not secure the necessary project commitments.

When people do not understand project quality assurance, they:

- Do not confirm that qualified processes are being used
- Do not gather sufficient data
- Do not improve work process execution
- Mismanage the human resource subsystem.

When people do not understand project quality control, they:

- Inadequately measure customer satisfaction
- Insufficiently test products against standards
- Inadequately perform statistical analyses of problem causes so that final deliverables do not meet customer expectations.

When people do not understand project quality closure, they:

- Do not provide for customer capability through training and support
- Fail to recognize and reward participants
- Neglect to collect and share lessons learned with other organization members.

To address these pressing needs for improving overall project quality management, we now show how the four project quality pillars can be applied during each of the five stages of project quality management. Each stage will

be covered in one of the following chapters, starting with Chapter 2: Project Quality Initiation.

NOTES

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4. Jeffrey S. Leavitt and Philip C. Nunn, *Total Quality through Project Management* (New York: McGraw-Hill, 1994).
5. Philip B. Crosby, *Quality Is Free: The Art of Making Quality Certain* (New York: Dutton, 1979).
6. Project Management Institute Standards Committee, *A Guide to the Project Management Body of Knowledge* (*PMBOK® Guide*) (Upper Darby, PA: Project Management Institute, 2000), p. 4.
7. Ibid., p. 38.
8. Joseph A. Petrick and Diana S. Furr, *Total Quality in Managing Human Resources* (Delray Beach, FL: St. Lucie Press, 1995); William M. Lindsay and Joseph A. Petrick, *Total Quality and Organization Development* (Delray Beach, FL: St. Lucie Press, 1997).