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Organization committed to an ongoing focus on quality must examine quality at three levels: organization, process, and individual. At each level, the organization needs to define its quality systems and standards, and then manage quality through improvement efforts. The organization that manages these three levels of quality creates a system context for its quality awareness education, its culture change efforts, and its quality monitoring and problem-solving tools.

The organization, process, and individual levels are interdependent, linked together in a total system that ultimately determines the quality of an organization’s products and services. If a customer receives faulty parts, there could be a problem at any or all of the levels. For example, the individual might have assembled the product incorrectly or let the faulty part be shipped. There might be problems in the basic processes that produce the product, including the design, production, order entry, and materials acquisition processes. The organization, represented by top management, might not have identified the quality required to be competitive, determined an appropriate strategy, or established the necessary policies, budgets, goals, and measures.

The individual can be trained in SPC and work hard at correctly assembling each piece. But that effort will be futile if the design process produces a product that is hard to assemble correctly, or if the purchasing process can’t get enough of the correct parts for a complete assembly, or if the sales and forecasting processes are not synchronized, leading to product changeovers that require the assembler to follow a different procedure every day. The individual’s quality effort will be further compromised if at the organization level the primary measure is “number of units shipped.”

A concentrated effort must be directed toward the organization, the process, and the individual (job) levels if total quality is to be achieved. An effort at the individual level (where most quality programs focus) is meaningful only in the context of the other two levels. Figure 1 shows the relationship among these three levels of quality.

Level 1: organization quality

To obtain a complete picture of a company, division, or department, the organization’s strategy and operational system have to be defined. Strategic (vertical) definition ensures that an organization is doing the right things. System (horizontal) definition ensures that an organization is doing things right. Quality management requires a simultaneous focus on both dimensions.

An organization’s strategy can be articulated by answering questions such as:

- What is the organization’s mission (reason for being)?
- Who are its internal and external customers?
- What are the products/services produced?
- What are the primary competitive advantages?
- What is the role of quality in the organization’s strategy?
- What are the priorities that drive resource allocation?
- What are the strategic goals?
- How will the effectiveness of the strategy be measured?

Each question should be addressed not only for current conditions, but also for future goals (what should or will be?). While these questions are the heart of the company-wide strategy, they are also relevant to portions of an organization. This is a vertical definition, because it results in a top-to-bottom view of each unit and its subunits.

The organization must then describe the operational system that best implements the defined strategy. This approach to system definition is based on several premises:

- Organizations are systems that employ various processes to convert inputs into outputs.
- Organization systems adapt to feedback from both internal and external sources.
- Work gets done (or fails to get done) horizontally or cross-functionally, not hierarchically.
- The greatest opportunities to improve organization performance often lie in the organization interfaces (the white space between the boxes in the organization chart).
- Functions already have managers; a person who
manages a variety of functions adds value only through managing the white space.

The tool used for system definition is the organization relationship map (see Figure 2). While the strategic definition describes the products and customers at a macro level, the organization relationship map gives a detailed picture of the inputs and outputs that flow among the various functions and eventually to the end customer.

The horizontal view shown in this map represents the "organization wiring" through which work gets done. High-quality wiring efficiently connects the necessary components of the system so that there is no stress on the system. System definition involves identifying and removing "disconnects," thus bringing the organization closer to its strategic goals.

**Defining organization quality**

An organization's quality requirements are its customers' quality requirements. A customer is anyone, internally or externally, who receives one or more of the organization's outputs (products or services). An organization map displays these supplier-customer relationships. A good way to define customer-driven quality indicators is to ask the customers questions such as:

- Which of our products/services do not meet your expectations? What are those expectations?
- Which products/services do you need from us, but are not getting? How does our failure to provide those products/services affect your operation?
- Are you receiving any products/services that you do not need? How do these extraneous products/services affect your operation?

The answers to these questions will include productivity and cost requirements, and those requirements that are traditionally associated with quality. Quality to a customer involves timeliness, availability, and value-for-money considerations; so the separation of quality, productivity, and cost measurement is only an internal convention. They all translate into customer quality. The customer requirements identified during the interviews can be converted into specific measures, and ultimately into performance standards. Figure 3 contains examples of customer-driven measures and standards.

An organization that is committed to quality often supplements its customer data gathering with benchmarking to compare its functions with similar functions in other organizations. Benchmarking ensures that the organization engages in continuous improvement, enabling it to compete and to meet customer requirements as they become more demanding.
An organization typically evolves through four stages when setting its quality standards:

- **Stage 1.** No quality standards
- **Stage 2.** Internally focused quality standards, based on analysis of operations
- **Stage 3.** Customer-focused quality standards, based on analysis of customer needs
- **Stage 4.** Customer-focused quality standards, based on customer analysis and benchmarking

However, an organization need not go through each of the stages to reach Stage 4. It can go directly from Stage 1 to Stage 4.

**Managing organization quality**

Customer interviews must not be part of a one-shot problem-solving effort focused on customer satisfaction. To ensure that organization quality management is an ongoing process, it is important to ask the customers an additional question: How will you provide us with ongoing feedback on our performance?

It is vital that an organization seek customer input on a regular basis. Customer interviews should not be restricted to external end customers. Quality and the relationships within an organization can improve dramatically when a function periodically asks its internal customers the questions listed in the section on defining organization quality.

Customer-driven performance standards should be used as the basis for goal setting, problem solving (closing the gaps between expectations and actual performance), performance appraisal, incentive compensation, nonfinancial rewards, and resource allocation. Benchmarking should also be an ongoing process. The organization that is managing quality has regular answers to two questions: Are we doing the right things (strategic quality)? Are we doing things right (system quality)?

**Level 2: process quality**

Describing an organization as a series of functions is less useful than describing it as a series of processes (step-by-step procedures for getting work done). The processes include marketing/sales, design/product development, manufacturing/operations, customer service, order filling, purchasing, and billing.

Most significant processes are cross-functional. As each functional manager strives to optimize those parts of the process that fall in his domain, the entire process may be suboptimized. For example, the custom product process could become suboptimal because:

- in striving to get more orders, the marketing function might include orders for customized products that are difficult or impossible to design and manufacture with the required quality, cost, and timeliness;
- in striving to create an elegant product, the design function might include bells and whistles that needlessly increase manufacturing cost and cycle time;
- in striving to increase its yield, the manufacturing function might produce expensive and unnecessary inventory.

Managing process quality begins with defining key cross-functional processes and the quality requirements of each.

**Defining key processes**

An organization's key processes are those that have the most effect on its customers. Questions that can help identify key processes include:

- What products/services are most important to the customers? (See the questions in the section on defining organization quality.) What processes produce those products/services?
- What are the key inputs (e.g., orders, requests, subassem-
blies) that stimulate activity in the organization? Which processes convert these inputs to outputs (products)?

- Which processes are most visible to the customers?
- Which processes have the most significant effect on the organization’s customer-driven performance standards: Accuracy/completeness/reliability? Timeliness/productivity? Cost?
- Which processes do performance data or common sense suggest have the greatest potential for improvement?

Once the critical processes have been identified, they can be visualized in a cross-functional process map, which represents a chain of value-added steps (see Figure 4). Just as with organization relationship mapping, process quality is managed by closing the gap between goals and performance.

**Defining process quality**

Defining quality at the process level begins with identifying the end customer requirements for the process. These customer requirements must then be converted into specific measures that should drive one or more internal measures for the overall process. The measures should cascade throughout the subprocess and sub-subprocess levels. The result is a set of meters located at key junctures of the process. These meters and the specific standards they generate serve as the basis for monitoring each step’s contribution to process quality and for troubleshooting the system when customer requirements are not being met. Statistical process control techniques can strengthen the measurement process by reducing the variability of the meter readings and by telling the user when a reading requires action.

**Managing process quality**

Managing process quality, like managing organization quality, requires a constant search for improvement opportunities. For example, a manufacturer of custom electronic components was suffering from excessive cycle time (the time from customer order to customer receipt of the product). The product was received late 83% of the time. It was believed that most of the delays were in the fabrication area. By developing a map

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**Figure 3.**
Examples of Customer-Driven Measures and Standards

<table>
<thead>
<tr>
<th>Requirements</th>
<th>Measures</th>
<th>Standards</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accuracy</td>
<td>Number of incorrect parts</td>
<td>No incorrect parts</td>
</tr>
<tr>
<td>Timeliness</td>
<td>Percent of on-time deliveries</td>
<td>99% delivered by the first day of each month</td>
</tr>
<tr>
<td>Availability</td>
<td>Percent of orders initially unfilled due to stock-outs</td>
<td>3% unfilled within 24 hours due to stock-outs</td>
</tr>
</tbody>
</table>

**Figure 4.** Cross Functional Process Flow (New Product Development)
and installing performance measures, the company found that some of the biggest delays were in other areas. It took 13 days for a customer order to even reach fabrication. During most of that time, the order was waiting for the next processing step. The end result of the initial process improvement effort was a reduction in total cycle time from 13 weeks to five weeks. More significantly, it is continually declining and has recently reached 19 days, with no decrease in product quality.

A key ingredient in the success of this and other process quality management efforts is the identification of a process owner, a person who takes responsibility for optimizing a total cross-functional process.

**Level 3: Individual Quality**

Most people want to do high-quality work, but are limited by systems that do not support it. While quality is made or broken at the individual level, it is important to create individual quality in the context of organization and process quality. For example, many workers often don’t realize the full potential of statistical tools because the tools are used at the individual level without being connected to the overall needs of the system.

**Defining Individual Quality**

Individuals are one component in a human performance system that, at a micro level, mirrors the organization and process systems. In the human performance system, the individual receives input, produces output, and then adapts his performance from the consequences (feedback) received (see Figure 5).

Defining individual quality requires developing standards for each individual’s key outputs. These standards should be derived from the standards established at the organization and process levels. Since customer-driven quality includes productivity and cost requirements, the areas in which individual quality standards can be set include accuracy, completeness, innovativeness, reliability, ease of use, timeliness, volume, rate, cost, and flexibility.

To develop individual quality, three questions need to be answered for each output of the individual’s job:

- What is required by the customer?
- How can the requirements be measured?
- What is the specific standard for each measure?

**Managing Individual Quality**

Managing individual quality involves managing the human performance system. The quality of an individual’s performance (output) is affected by four factors. First, the input an individual receives affects the quality of work. This includes the clarity of performance expectations, the logic of the work procedures, the adequacy of resources, the sufficiency of skills and knowledge, and the clarity of the “signals” that trigger performance. Second, the positive and negative consequences for performing as desired (or not as desired) affect an individual’s work. Third, the feedback an individual receives plays an important role. What information is given, when and how often it is provided, and the manner in which it is given all are part of feedback. Finally, an individual’s physical, mental, and emotional capacity to perform affect the quality of his work.

If the quality standards are not being met, the cause lies in one or more of these areas. For example, if an individual does not complete a form in the required way, certain questions have to be asked:

- Does he know that the form needs to be completed?
- Does he know what a well-completed form looks like?
- Does he know how to complete the form?
- Does he have sufficient resources to complete the form?
- Does he receive feedback on his form completion?
- What will happen to him if he completes the form correctly and if he completes it incorrectly?

This last question is particularly important. Managing consequences is a key element in managing individual quality. If the individual takes the time to complete the form correctly and his supervisor complains about him falling behind in his other work, the consequences do not support that activity.

As this example shows, the performance system can be used as a troubleshooting tool. However, more significant is the fact that each of these performance system components represents an opportunity to:

- improve performance that meets the current standard.
- create an environment that supports a new piece of desired performance.

In addition to being the foundation for individual improvement, the quality standards can serve as fundamental perform-
ance tools in appraisal, compensation, and succession and career development planning.

The quality audit

The total quality approach presented here suggests questions that can be used to assess the degree to which quality has been defined and is being managed. If a company is serious about quality improvement, it should answer these questions:

Organization (Level 1)
- What is our company strategy?
- What, specifically, are the aspects of quality that differentiate us from our competition?
- How is the quality of our strategy measured?
- Where are the gaps between our quality vision and reality?
- How can we define (map) our organization so that it supports our quality strategy?
- What are the systemwide measures (beginning with customer measures) against which we should assess our performance?
- Where are the gaps in our systemwide quality performance?
- How can we best ensure that organizationwide performance is assessed regularly in terms of these measures?

Process (Level 2)
- What are the key cross-functional processes that affect customer quality?
- What is the most effective design for these processes?
- What are the most useful measures of overall process quality and of quality at each key process step?
- Where are the gaps in our process quality performance?
- How will we ensure that we manage these processes and the functions through which they flow?

Individual (Level 3)
- What are the appropriate individual quality measures, based on the organization and process measures?
- Where are the gaps in individual quality performance?
- How can we ensure that these measures serve as the foundation of human performance management?

The answers to this quality audit should tell the company the role quality should play; the current opportunities for improving organization, process, and individual quality; and the long-term system that needs to be in place to manage for quality. This audit can substantially increase the odds of solving quality problems and implementing an ongoing quality system.

As partners, Alan P. Brache and Geary A. Rummel are responsible for the strategy and operations of The Rummel-Brache Group, a research and consulting firm that specializes in the design and development of organization performance systems for both business and government. Rummel is the founder of The Rummel-Brache Group. Brache is an ASQC member.

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October is
National Quality Month

On the cover: "Beyond Customer Satisfaction" is the theme of this year's National Quality Month campaign. Copies of this 1988 NQM theme poster by David Wilcox are available for $3.50 each. To order your poster, contact the order entry department at 800-952-6587 and ask for item number Q705.

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