Quality Measurement

in a Facilities Environment

by Richard W. Robben P.E.

Traditionally the responsibility for ensuring quality has resided with the provider and was generally tracked and ensured through the use of inspection. Increased competition and greater demands by the end users of products and services, has resulted in a rethinking how quality is measured and delivered to the customer.

Total Quality Management (TQM) and Process Re-engineering have served to focus attention on the methods of service delivery or the processes used as a way of building quality into the final product. Inspection still plays a significant role in the total quality picture but is not the final measure. Below is a process that builds on customer expectations and asks:

1. What are the critical indicators that will define quality?
2. What actions can be taken to ensure that critical quality indicators are met?
3. How do you track all the processes so that indicators are maintained and reported back to stakeholders?

Determination of Quality/Performance Measures

Most facility departments in the United States do not measure the performance of their operations. Reliance on "rules of thumbs, subjective evaluations, or war stories" are not typical techniques for reporting on the quality of delivered service. Instead measures used should be based on several important considerations:

Rich Robben is the director of plant operations at the University of Michigan, Ann Arbor, Michigan. He can be reached at rrobben@bf.umich.edu. This is his first article for **Facilities Manager.**

1. Customer Input

The most important requirement for the development of quality measures is a determination of factors that are critical to the customers and occupants of the facilities. To meet the customer's perception of quality, their input is necessary. Typical concerns of the customer that generally shape their opinions on the level of quality surround timeliness, cost, high standards of workmanship, worker courtesy, communication of issues and status, and the customer's level of control over the process.

Developing Customer Expectations

Measuring customer expectations and then aligning those expectations with the delivery mechanisms is the whole issue. It is impossible, however, to measure, record, and report quality without a definition of what constitutes quality. Several simple methods can be utilized to gain this valuable information.

A routine meeting that we call a customer focus group has served successfully for this purpose. The basic format of the meeting depends on where in the process of quality definition the facility organization is positioned. By working directly with the customer and reviewing their needs, topic-by-topic, the facility manager can achieve three objectives:

a. The customers' expectations for the space can be developed in tangible terms of cleanliness, temperatures, pressures, available times for service, acceptable deviations, lighting levels, etc. Vague or subjective language can be avoided in favor of tangible or quantitative terms.

b. By being present during the development of the expectations, the facility manager can interject information concerning the capabilities of the systems or the

workforce, budget restrictions, regulatory issues, etc. Major discrepancies between expectations and capabilities can be identified at the outset of the process and resolved.

c. The customers' desired level of involvement can be determined. Does the end user wish to receive performance reports, cost information, or be involved with the prioritization of work requests?

This meeting also provides an excellent medium for the maintenance of positive customer relations and continuing customer education.

Another method of obtaining customer input to the quality definition involves the use of questionnaires and survey instruments. Some considerations covered in the survey instrument include the following statements.

a. It must be targeted at the correct individuals within the customer group. The danger here is that the survey may be filled out by an assistant or individual other then the person who will be ultimately judging acceptable performance.

b. If the survey is intended to be a snapshot of a particular issue, then the instrument should be short and to the point and the questions should be worded so that the responses can be reported back to all stakeholders as a measure of service quality.

c. Another concern is that the same customers often keep receiving the surveys and can become inundated and, as a result, may not complete the surveys or may dilute the response quality. An alternative to the written feedback survey instrument could be a brief telephone survey.

2. *Methods of Collecting Data*

Unless there is a relatively simple method for collecting and reporting data, any system used will be difficult to monitor and may fall into disuse or data contamination. Computerized maintenance management systems (CMMS) can quickly and easily be configured to provide reports that can track the planned performance requirements. It is critical, however, that the methods of inputting the required work history are simple and in agreement with the types of information that need to be collected to support the quality measures.

Choosing elevators as an example, the mean time between elevator failures cannot be reported if the time and date of failure and the return to service are not recorded. Often work order creation and closeout dates are generated automatically by an CMMS. Clearly, this would not satisfy the data need if mean time in hours was a critical quality indicator. Therefore, when developing quality indicators, "reality checks" should be made during the process to guarantee the feasibility of tracking and reporting of the quality factors.

3. *Standards*

Relying solely on the customer's expectation is an excellent way to abrogate the facilities managers' fiduciary responsibility for the stewardship of facilities. We as facility managers have access to a wealth of information from a variety of sources to assist us in determining the correct methods of maintenance, operation, and construction. Some of these sources are can include the following.

Trade Organizations

As members of trades organizations, we receive information covering every conceivable facility topic. Information on organizational structure, staffing, and processes for every aspect of facilities management can be obtained. Some organizations of note are:
- APPA—Association of Higher Education Facilities Officers
- IFMA—International Facility Management Association
- BOMA—Building Owners and Managers Association
  There are many more.

Benchmarking

As with the trade organizations, information can be gained from interchanging information with those organizations that are viewed as peers or companies that perform some aspect of the facilities responsibilities particularly well. Ideas can be gained from other organizations complete with all the details of how to execute them.

Manufacturers

Manufacturers and their related associations also provide information on the details of maintaining equipment and structures, good design practices, acceptable maintenance intervals, methods and practices for improving service, and controlling maintenance costs.

4. *Expertise of the Workforce*

Quality service delivery begins with the worker and lies in the knowledge level of the workforce. Knowledge level goes beyond the single aspect of technical expertise. Technical knowledge of the job is important, but so is expertise in the processes of delivering service. Training is the key to a capable workforce that is customer oriented. Programs for the enhancement of worker skills should cover: customer service, effective communication, work procedures (non-technical), safety, and technical maintenance skills and procedures.

Training

Training should be conducted on items directly bearing to the performance of work and tracked to ensure it is properly conducted. Training should also be reinforced on the job through quick application of what is learned.

This process should determine the required aspects of training or what the needs are. Determining needs is twofold: first, to ascertain at a high level what types of training are required to support the service delivery mission, and second, working at the lower levels in the structure using work teams of individuals involved in the process to fill in certain detailed

training activities as required. Typically the following types of training will be in the program:

a. Process—The procedures of administering the work process.
b. Safety and Regulatory-Learning the regulations to ensure code compliance.
c. Technical—That which is necessary to maintain the technical skills of the employee.
d. Personal Development—Content is determined by the values of the organization, 7-Habits, advancement, etc.

The information/criteria collection process described above is the most difficult aspect of measuring quality. It is critical at this stage to use an iterative process of identifying quality criteria and then checking:

a. The stakeholder agreement with the selected criteria.
b. The ability to track the selected quality indicators.

If either of these parameters is not present, revisit the selected indicators, the stakeholder's opinions, and the methods of collecting the data.

The Administration of the Process

How well the quality measurement process can be sustained is directly related to the effort made to correlate the desired quality measures against the means of tracking the raw data. CMMS are typically the cornerstone for tracking and reporting the raw data. It is critical, however, that the raw data is collected and input into the database. Several considerations bear attention by the facility manager in administering this part of the process.

Access to Results Data

The information gained serves no value if it is distributed on a limited basis to the organization. It is important that access to CMMS terminals or distribution reports are provided to all stakeholders. If workers and management are to act on the data, then it must be readily available. Also, the backup information must be easy to analyze and utilize for quality improvement.

Worker Involvement in the Data Collection and Input

Recording of input data should be as close as possible to the services delivery point. Electronic methods such as bar coding and PDA's can be used in many maintenance applications. Time recorded on the ticket, feedback in form of repair, and problem codes can be easily entered as text comments.

Quality of Input Data

The accuracy of the information being entered into the quality database must be high. Data bits should be kept as simple as possible. Code data can be used to replace text. For example, the use of repair and problem codes is necessary to avoid the use of text entry that can be misinterpreted or difficult to analyze. The input process needs to be closely monitored and the personnel responsible for input of data must be kept aware of the procedures and the need for accuracy.

Time Lags in Data Input

Delays in entering data in the CMMS can cause reporting problems. For example, materials may be assigned to work orders at a time point in the work order process that is different from the other data. These time lags must be considered in the reporting process to make sure information is complete before it is reported as final.

Level of Effort to Enter Data

Depending on the application of the data, every effort should be made to make data entry as simple as possible. It should be an integral part of the work process. Training is key in this area. If those responsible for the development

and entry of results data view the data collection as problematic, it will not occur as anticipated.

What to Track

The indicators below are typical, but not all exclusive of the types of customer-focused measures that will develop as a result of the process. Three categories related to time, value, and cost are presented.

Time

Timeliness of delivered services is a critical evaluator of service level by the customer. The following may provide assistance in making suggestions to stakeholders in order to track quality associated with time.

- **Response Time.** The time that it takes to respond to customer requests for service can be tracked as an indicator of the ability of the organization to provide prompt service delivery. Some examples could be first response, time to completion, or time to invoice.
- **Scheduled v Actual.** "On-time performance" compares when a service item is scheduled v when the service is actually provided.
- **Preventive Maintenance Completion Rate.** This measures the compliance by the service provider in completing predetermined work tasks.
- **Work Status.** Knowing what is going on and communicating it to the customer creates a strong customer provider relationship.

Value

Underlying this element is the basic assumption that by meeting the customers expectations, you are 90 percent of the way to providing quality service. The following indicators are suggestions of how well the organization plans and executes the service.

- **Rework.** Tracking the number of times that services have to be re-performed because of mistakes, poor workmanship, improper definition of scope, or inadequate communication are excellent measurement indicators.
- **Change Order Rate.** The number of change orders that are required during a project or on a work request are indicators of the quality of the original scoping documents and/or description of the service required. This factor is also an indicator of how well original estimates are met.
- **Breakdown Rate.** This measure provides an indicator of the effectiveness of the maintenance

program. For example, as preventive maintenance effectiveness increases, the number of corresponding breakdowns should decrease.

- **Training level.** Track and report the training level of the organization by comparing the items identified in the needs analysis v the amount of training actually conducted.
- **Deferred Maintenance.** Assess the condition of the facilities at regular intervals and report the level of required work needed to bring the facilities back into a new condition.
- **Customer satisfaction.** Direct customer surveys can provide a clear and direct indicator of an organization's ability to meet customer expectations. Formulation of the survey questions using customer input is critical.

Cost

Far too often this indicator is taken out of the context of quality indicators and made to stand on its own. Taken by itself, cost can be the nemesis of quality. If cost is to be an indicator then expectations must be aligned with what can be achieved at the target cost level. Some indicators of cost are:

- **Estimated v Actual Cost—**The ratio of a pre-estimated cost divided by the actual cost to perform a specific service. This can include labor materials, subcontracted

services, or any combination thereof. This indicator can be applied to single work orders, projects, or service contracts.

- **Charge or Recharge Rate—**The cost of the workforce on a unit basis that can be compared to similar rates of other organizations or contractors. One labor/hour of work with benefits, overheads, and profits (if applicable) can be tracked and reported to stakeholders. These can give an indication of the value of the internal company facility organizations' use of outside contractors.

How to Report Back to the Stakeholders

Information on the performance of the service organization is of no value if only higher levels of management retain it. Quality indicators should be shared with all stakeholders. Therefore, the first rule of using, recording, and reporting quality is to distribute the information widely.

Management should review quality information regularly with customers and workers. Some of the same methods that were used to develop the quality parameters can be used for discussion of the resultant performance measures. Specifically, the customer fo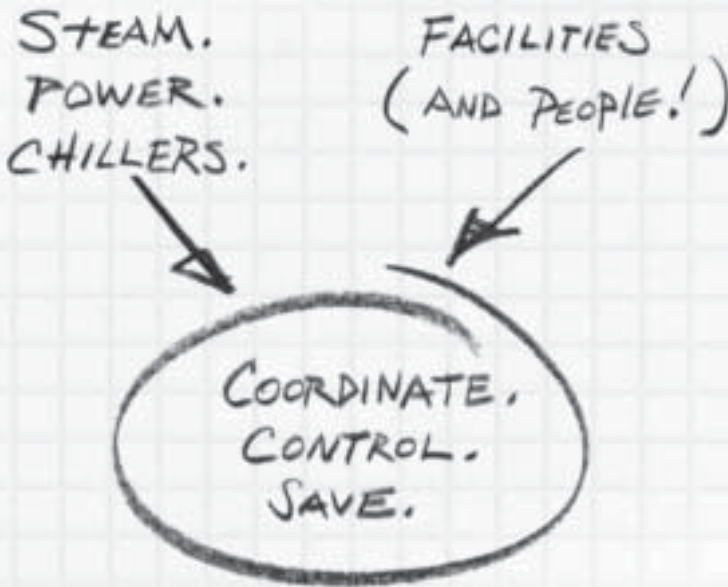cus group or a routine quality meeting should be a recurring event to serve this purpose as well. This meeting will provide a critical interface to ensure that all parties are interpreting the data in a similar fashion. It provides a forum in which deviations can be discussed, remedies determined, and expectations reconfirmed. It will also address several critical factors associated with the determination of quality that should be reviewed at the performance meeting including:

- Customer satisfaction with the process
- Work plan adherence—service contract
- Routine reporting of indicators
- Cost comparisons—value
- CMMS utilization—presentation and collection of data

Since not all customers will wish to meet routinely with the service provider, it is important that reports generated serve as a good substitute for these meetings.

The process of ensuring quality requires the attention of the facility manager. Systems can be established that will ease the amount of time that needs to be committed to the collection of data, but a strong commitment of time and resources must be made by the manager to keep the quality topic at the forefront of the organization. Training, review of the data collected, acting on that information, and openly communicating the information to the customer and all levels of the organization are the foundations of operating in a quality environment. ⬨