

Define Phase Tools

“A goal without a plan is just a wish.”

—Antoine de Saint-Exupery

“In preparing for battle I have always found that plans are useless, but planning is indispensable.”

—General Dwight D. Eisenhower

“An expert is one who avoids the small errors while sweeping on to the grand fallacy.”

—Anonymous

BACKGROUND

Every improvement project must start with a thorough understanding of the quality issue to be improved. A common error at this stage is to assume that one person’s perception of a problem is correct, without examining supporting data or at least other perceptions that can provide more insight into an issue. The Define Phase of the improvement cycle avoids such errors through a structured problem analysis that examines an issue and develops a process map to unambiguously communicate the elements of a process that are working well and those that are not working very well. One key to an effective improvement effort is a clear understanding of the

process, as well as the goals and objectives for change. The deliverables from the Define Phase help communicate process issues and improvement goals in a manner that should be understandable by all stakeholders.

Define Phase tools that will be discussed in this chapter include the following:

- Project charter
- Voice of the Customer
- Kano model
- Stakeholder analysis
- Process mapping, including SIPOC process map
- Brainstorming and its variants
- Multivoting and list reduction
- Affinity diagram
- Critical-to-quality (CTQ) analysis

The goal of applying these tools is to produce several key deliverables, including:

- Fully trained team
- Customers identified
- High impact characteristics (CTQs) defined
- Team charter
- Process mapped
- Adequate budget
- Senior leadership support

The key to ensuring a highly effective outcome for the project is inherent in those deliverables.

PROJECT CHARTER

It is useful to think of the charter as a contract between leaders and the project team. Created at the outset of the project, the purposes of the project charter are numerous:

- To clearly state the purpose and goals of the project
- To provide background on the reason(s) for the project

- To ensure alignment of project and team goals with organizational priorities
- To identify resources available and constraints for the project
- To delineate deliverables and define success

The project charter is the document that the team leader uses continuously to keep the team focused on the task and expected outcomes. Other stakeholders usually receive an executive summary of the project to serve as a reminder of the project's importance, timeline, and deliverables. Senior managers can refer to the project charter when evaluating resource allocation decisions to ensure that the return from the project is justified by the expected outcome.

Project charters vary substantially in structure and content, but in general the document should include the elements listed in **Table 2-1** and include the following:

- Background and purpose
 - What prompted the interest in the project?
 - Where is the project positioned in the organization's priorities?
 - Which organizational leaders and/or departments are most interested and invested in the outcome?
 - Which systems in the organization have been malfunctioning and to what extent?
 - What is the underlying reason for the project (e.g., cost containment, patient safety, member satisfaction, etc.)?
 - Over what period of time has the issue developed?
 - How quickly does the organization need a solution?

Table 2-1 Project charter contents

Charter element	Description
Background and purpose	<ul style="list-style-type: none"> • Description of the process or issue to be addressed and its importance to the business • Problems with the current process—what motivated the project?
Mission statement	<ul style="list-style-type: none"> • Succinct statement of the project purpose and goals that includes the purpose and direction for the team • Links to organizational mission statement should be evident

Table 2-1 Project charter contents (*continued*)

Charter element	Description
Scope	<ul style="list-style-type: none"> • Boundaries and limitations • Project outcomes—what goals must the project achieve? • Project milestones—timeline of steps (sometimes called “gates”) that will be achieved during the project • Deliverables—what reports, measures, processes, products, or services will the project deliver when complete? • Cost estimates—budgetary limits for the project, including staff time and costs for other resources • Organizational interfaces—departments or workgroups expected to be affected by the project • Other stakeholders affected by the project • Urgency/priority of the project • Source of team empowerment (e.g., Senior Vice President of Health Services) and allowed functions (e.g., review and execute contracts)
Team composition and roles	<ul style="list-style-type: none"> • List of functional areas, skills, levels of expertise, and external stakeholders who need to be represented on the team, usually divided into core team members and extended team members • In some cases, specific names may be included in the list • Roles for each of the team members (e.g., leader, subject matter expert, recorder, etc.)
Operational framework	<ul style="list-style-type: none"> • Special environmental factors (e.g., team work locations, software, computers, etc.) • Accountability—who on the team is accountable for which parts of the project? • Decision-making processes—methods for making and reporting decisions (e.g., majority vote, super majority, weighted voting) • Conflict resolution rules and procedures—final authority for any conflicts that arise • Process improvement tools and procedures • Procedures for changing team members and/or leaders
Performance measures	<ul style="list-style-type: none"> • Measures of team performance, such as deadlines for deliverables • In-process metrics to determine level of success for team, such as results of pilot test, process efficiency measures • Outcome measures for project (e.g., goals achieved)
Support requirements	<p>Any other support needed, like consultants, special measurement systems, facilities, outside vendors</p>

- Mission statement
 - Succinctly describe the mission of this project; mission statements should be two or three sentences at most and capture the essence of the goals and objectives of the effort
 - Relationship of the project mission to the organizational mission statement
- Scope
 - Departments and divisions affected by the project
 - Economic and budgetary limits for project activities and recommendations
 - Business and work processes affected by the proposed project
- Team composition and framework
 - Core team members—those team members who will participate throughout the project
 - Additional team members—those team members whose expertise may be needed from time to time, but not continuously throughout the project
 - Consultants—specialized staff or external resource people who may be needed for specific issues
 - Support staff—administrative staff who facilitate the team’s work, such as taking and preparing meeting notes, arranging for meeting space, etc.
- Operational framework—the improvement or planning paradigm to be used by the team for executing the project; for example, the team may use a company-specific improvement model or the DMAIC model or perhaps a lean model
- Performance measures—a list of all measures that will be used to assess the project, including:
 - Structural—infrastructure elements required for a project or the underlying process to be improved; these measures can involve equipment, staffing, capital investment, physical facilities, or information systems
 - Process—in-process metrics usually include milestones or “gates” that indicate the project is proceeding according to the planned schedule
 - Outcome—these measures vary widely by project, but usually include an implementation plan for the new process, as well as a “scorecard” of measures to assess the process going forward

- Support requirements—any other support requirements not previously mentioned in the charter, such as particular senior leader team sponsorship

In some cases, the executive(s) that commission the project may provide the charter, but if not, then the leadership team for the project should ensure that a charter is created and confirmed by the executive(s) before starting to work. A project charter template is included as **Figure 2-1** and at the online resource center for this book.

VOICE OF THE CUSTOMER

The best place to start with any project is a thorough understanding of the customer in as many dimensions as possible. Customer characteristics, like basic demographics (name, address, contact information) constitute some of the key data elements of any project, but other traits, such as ethnicity, gender, and age, may also help in project planning as a means of tailoring a service or product to a particular population. For example, if a team wanted to develop a program to improve blood pressure control in a population that included a subset of Mandarin Chinese people, then surveys and educational information may need to be adapted to accommodate unique language and cultural needs. This information is used to develop methods of obtaining the **“Voice of the Customer” (VOC)**, which involves the process of capturing feedback from customers to better understand their requirements. The VOC process is not a one-time project, but rather systematic development of a “listening and learning” culture that obliges all employees to collect formal and informal customer feedback to drive continuous improvement of the organization’s services and products.

The VOC process needs to capture both stated and unstated customer requirements using tools such as those in **Table 2-2**. Perhaps the most widely used method of gaining insight into customer requirements in health care is the standardized survey. Companies like Press Ganey (<http://www.pressganey.com>) and NRC Picker (<http://www.nrcpicker.com>) have developed validated questionnaires for healthcare organizations to use to query customers regarding issues like promptness of service, facility cleanliness, staff friendliness, time spent with the doctor, and other satisfaction issues. These services have substantial associated costs, and so many smaller providers (e.g., medical office practices) are unable to afford to survey patients in this manner.

Project Charter
for

Project Name:	Project Number:	Prepared by: (Project Manager)	Date Submitted:
Customer:	Department:	Contact:	Project Type:

Project Start Date:	Project End Date:	Milestone 1	Milestone 2	Milestone 3	Milestone 4	Milestone 5	Milestone 6
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Background and Mission:

Scope:
 Business Case Summary:

 Business Goals:

 Project Objectives:

 Deliverables:

 Beneficiaries:

 Key Requirements:

Resources:						
Core Team:	Name	Department	Weekly Time Commitment	Start Date	End Date	Comment

Adjunct Team Members:						

FIGURE 2-1 Project charter template

Other Human Resources:						
IT						
Support Staff						
Consultant						
Ancillary Resources:	Description	Number or Degree	Weekly Time Commitment	Start Date	End Date	Comment
Travel						
Supplies						
Software						
Hardware						
Training						
Other						

Risk Assessment (With and Without Project):
Risk if Project Done-risks Associated With Project
Risks if Project not Done-business and Other Risks of Status Quo
Constraints and Boundaries

Budget										
	Description	Staff	Consultants	IT	Travel	Supplies	Hardware	Software	Training	Totals
										\$ -
										\$ -
										\$ -
										\$ -
										\$ -
										\$ -
										\$ -
										\$ -
										\$ -
										\$ -
	Total	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -

Summary

Sign Off:

Project Manager	Supervisor	Executive Sponsor

FIGURE 2-1 Project charter template (continued)

Table 2-2 Voice of the Customer data collection methods

	Formal	Informal
Stated	Individual structured interviews	Individual open interviews
	Standardized surveys	“Quickly” questionnaires
	Focus groups	Spontaneous group sessions
	Formal proposal specifications	Customer inquiries and requests
	Complaint logs	Customer complaints to staff
Unstated	Structured observation of customer behavior	Staff observations of customer behavior
	Warranty data and product returns	
	Medical-legal actions	

Fortunately, the Agency for Healthcare Research and Quality (AHRQ, <http://www.ahrq.gov>) has funded development and validation of a number of survey tools known as the Consumer Assessment of Healthcare Providers and Systems (CAHPS) surveys. Since these surveys were developed through federal grants, the surveys and comparison datasets are available on the AHRQ Web site at no charge. The CAHPS Consortium, a panel of survey experts, has led the development of several instruments since the mid-1990s and continues to build and support a wide-ranging and growing family of standardized surveys that poll consumers and patients on their experiences with health care and include such issues as provider communication skills and access to care.

Detail: The CAHPS Consortium

The CAHPS Consortium consists of federal agencies and private research organizations. The federal agencies include one of the primary funders of the project beginning with the first CAHPS survey for health plans, the Centers for Medicare & Medicaid Services (CMS). Other federal agencies involved in CAHPS include the Centers for Disease Control and Prevention and the National Institute for Disability and Rehabilitation Research. Private researchers are awarded grants for their participation in the program and include experts in survey development, quality assessment and improvement, and reporting, such as Harvard Medical School, Research Triangle Institute, and RAND. For the second phase (CAHPS II), AHRQ funded five-year cooperative agreements with the American Institutes for Research, Harvard Medical School, and RAND, and for the most recent phase (CAHPS III), the Consortium added the Yale School of Public Health and RAND. The Agency also has engaged Westat to support the work of the Consortium and the CAHPS User Network, as well as managing the National CAHPS Benchmarking Database.

CAHPS surveys include instruments for assessing the quality of care in both ambulatory and institutional settings, and each survey package includes the survey questionnaire, administration protocols, analysis and reporting guidelines programs, and guidance in reporting results.

CAHPS Surveys and the Voice of the Customer

The first CAHPS survey was developed to measure consumer satisfaction with health plans, and this instrument has become the standard by which health plans are measured and, in recent years, classified for incentive programs. The CAHPS Health Plan Survey is used by commercial, Medicaid, State Children's Health Insurance Program (SCHIP), and Medicare plans representing more than 120 million enrollees. Consumers can view results of the surveys on the CMS Web site (<https://www.cahps.ahrq.gov/CAHPSIDB/Public/About.aspx>), and the CAHPS survey is one of the components behind the Medicare Star Ratings report (http://www.cms.gov/PrescriptionDrugCovGenIn/06_PerformanceData.asp) that ranks health plans on Health Effectiveness Data Information Set (HEDIS), CAHPS, and Health Outcomes Survey (HOS) performance. Additionally, the National Committee for Quality Assurance (NCQA) incorporates CAHPS results into both its health plan performance reports as well as its health plan accreditation process.

The Consortium also developed surveys during the second phase of CAHPS that assess consumer experience in ambulatory settings, such as physician offices, managed behavioral healthcare organizations, dental plans, and tribal clinics. The standardized, validated approach to data acquisition and reporting make them invaluable for any organization to measure the voice of the customer in these specific settings. Additionally, the ambulatory care survey¹ includes optional supplemental items that may be added to specific instruments without changing the validity of the instrument.

CAHPS surveys include instruments tailored for patient satisfaction measurement in other healthcare facilities, such as hospitals, nursing homes, and dialysis centers. The CAHPS Hospital Survey, often referred to as H-CAHPS or Hospital CAHPS, focuses on adult inpatient satisfaction with hospital care and services. Hospitals across the country have adopted the survey for measuring inpatient satisfaction and voluntarily report their data to CMS for inclusion in the CAHPS database used for benchmarking and comparisons. Another CAHPS survey has been fielded

for use in hemodialysis centers for patients with end stage renal disease, and a nursing home survey is nearly ready for distribution.²

AHRQ supports the surveys through a variety of no-cost services, which include the CAHPS User Network and the National CAHPS Benchmarking Database. The CAHPS User Network helps users with technical questions and allows users to interact with each other and CAHPS researchers. The User Network provides the following resources:

- **Free technical assistance**—users can pose questions via a toll-free number (800-492-9261) and an e-mail address (cahps1@ahrq.gov)
- **A comprehensive CAHPS Web site** (www.cahps.ahrq.gov), which houses the following:
 - CAHPS Survey and Reporting Kits—questionnaires, reporting measures, administration protocols, analysis programs, and instructions for using the CAHPS products
 - New and upcoming CAHPS products
 - Resources to support implementation of a survey project, public reporting of survey results, use of CAHPS surveys to improve quality, and translation of CAHPS surveys to other languages
 - Searchable FAQs and bibliography
 - Materials and other information developed for CAHPS events, webcasts, and national user group meetings
 - Resources designed to support users in identifying and networking with other organizations that are doing similar or related work
- **Newsletter**—*The CAHPS Connection* newsletter³ keeps users informed about new programs, events, and survey changes

National CAHPS Benchmarking Database

Not only does the CAHPS survey provide a validated resource for gathering patient satisfaction in a number of settings, but the system includes a benchmarking database to compare an organization with others that are similar. The database incorporates data from commercial and Medicaid plans that has been collected for over a decade. CAHPS program sponsors can obtain reports that compare survey results to database benchmarks, access data from individual surveys, and receive customized reports for a fee. The database has become an important source for research into consumer evaluations of healthcare quality in each of the survey domains.

Other Methods of Listening to the Voice of the Customer

Survey methods are widely used in health care to hear the VOC. However, astute healthcare organizations have learned a number of other ways to understand customer requirements, including:

- Formal customer listening methods
 - Complaints/appeals/grievances
 - Customer comments and questions
 - Focus groups
 - Retention/referral analyses
 - Kano model
- Informal customer listening methods
 - Short informal surveys
 - Community networking
 - Web site

One of the most useful ways of determining customer dissatisfaction is by analyzing customer complaints to determine system issues and trends. For example, if customers register a large number of complaints about the noise level on a hospital unit, the staff should evaluate the sources of the noise and work to eliminate them. In some cases, the trend in number of complaints also can be helpful in discerning targets for intervention. Many healthcare organizations monitor their complaint logs, often by capturing complaints in a database and categorizing them for analysis. Tracking these complaint categories can help quality improvement staff to determine upward trends in certain issues that, although they may not have reached a critical threshold, may represent opportunities for improvement. Complaints in provider organizations are usually handled through a formal process such as that described in **Example 2-1**, but complaints in payer organizations are managed somewhat differently. Because state and federal oversight agencies consider customer complaints to be important indicators of health plan quality and access to care, a system of managing these problems has evolved that generally involves three levels of severity:

1. **Complaint**—a health plan member calls the member service line to complain about a service, provider, or to request assistance receiving a service that has been denied. If the member service coordinator can resolve the issue at that encounter, the complaint is considered closed.

2. **Grievance**—if the member service coordinator is unable to resolve the complaint, then the complaint is usually converted to a grievance, which escalates to health plan staff for further review to determine if the complaint can be decided to the member’s satisfaction. If the result is not acceptable to the member, the next step is an appeal.
3. **Appeal**—if the health plan has not resolved the grievance to the member’s satisfaction, then the issue is referred to an outside arbiter, such as an administrative law judge, for final adjudication. This level generally represents the final step in the process.

Health plans track the appeals and grievance process to find opportunities for improvement, as well as indications of the effectiveness of its utilization management programs.

Example 2-1 Complaint log analysis

Perfect Sat Hospital maintains a customer complaint log that allows entry of patient complaints either directly by patients via the Web site or by any staff member who receives a complaint from a customer. As the data are entered into the log, each complaint is categorized into one of five domains: 1) staff, 2) facilities, 3) dietary/nutrition services, 4) administrative functions (e.g., billing, collections, etc.), and 5) physicians. The staff tracks the *rate* of complaints per 1,000 patient days by graphing them on a control chart, adding a new point each month. When a point indicates a special cause, the staff immediately launches a Root Cause Analysis (RCA) to determine the underlying cause. The staff also evaluates the trend of complaints to determine if an upward (unfavorable) or downward (favorable) trend is present. If an upward trend is detected, the staff investigates the underlying causes using either a RCA or a Failure Modes and Effects Analysis (FMEA).

In addition to surveys and formal complaint processes like that in Example 2-1, quality oriented organizations also develop methods of capturing customer comments and complaints that may be expressed in more informal ways. For example, many organizations will encourage employees to record and report comments made by customers during informal encounters during their daily work. For example, (true story) an employee at a hospital observed a four-year-old sibling of another child skipping down the hallway singing “we’re gonna sue you!” She reported the observation to the risk managers at the hospital who intervened with the parents and helped defuse the situation. In addition to mitigating obvious risks, these informal observations may also identify some other opportunities for improvement, such as cleaning services or dietary department performance.

Focus groups are typically used to get more in-depth customer views regarding a concept, product, or service. These facilitated sessions are led by a moderator who leads a group of participants through a discussion on a particular topic that follows a plan with questions, prompts, tasks, and exercises. The success of a focus group depends on the moderator, who must generate interest in the subject, involve the entire group, direct the discussion loosely enough to allow for digressions that might provide more information about the topic, and avoid directing the group in a way that reflects the sponsor's expectations. The focus group is often most effective in gaining insights from group interactions, as well as individual contributions to the discussion. For example, if a new product is being reviewed, the group might be given a prototype to examine both individually and as a group. After group members have worked with the prototype, they can come together and discuss their reactions. Outcomes and deliverables from a focus group include notes and transcripts of the sessions, sometimes in audio or video format. The facilitator or sponsor usually creates a report summarizing the purpose of the study, a description of the procedures, detailed findings, and significant themes that emerged within and between focus group sessions. Focus groups are usually fairly inexpensive, but in the hands of an unskilled facilitator, the information gained from a session may be misleading. As with any survey technique, data from a focus group can be distorted by poor memory, unwillingness to be truthful, and subject selection bias. Moderators must have the requisite skills to conduct effective group sessions and manage the vagaries of group behavior.

Customer retention and willingness to refer are often included as part of customer satisfaction surveys; for example, the requisite questions are included in CAHPS surveys. Analysis of this data is important to determine the likelihood of customers returning to the organization. New customers almost always require some investment in marketing, advertising, and other outreach activities, while returning customers do not require that level of investment. Thus, retaining current customers should be a high priority for any organization, and efforts to improve service quality and cost are the most effective ways of achieving that goal. Additionally, customers who would refer their family and friends to the organization are also an important indicator of organizational quality and effectiveness, and these referred customers generally cost less to recruit. Finding the

underlying reasons for loss of customers and unwillingness to refer helps identify opportunities for improving the organization's services.

Finally, many institutions have informal methods of getting information from customers, such as conducting their own short surveys of customer satisfaction. These short questionnaires usually focus on a specific aspect of service that one of the service units wishes to evaluate. For example, a patient care unit may wish to learn more about customer satisfaction with pain management, while the billing office may want to better understand complaints related to billing errors. Rather than change the process for the formal satisfaction survey, the unit may create and deploy a short survey, often consisting of just a few questions that are not on the standard patient satisfaction instrument. These short surveys focus on a specific problem and can help identify some specific improvement issues fairly quickly. Although they lack the rigor of a typical patient satisfaction survey, they are widely used to help staff understand and resolve specific quality problems.

In addition to the short surveys, organizational leaders and other employees may participate in community activities and collect comments from customers and other stakeholders for analysis as part of the VOC effort. Some other contemporary methods of gathering customer opinions and comments may involve interactive Web sites that provide the organization with unstructured but readily available customer data.

KANO MODEL

Developed by Professor Noriaki Kano in the 1980s as a method of stimulating innovative product/service design, the Kano Model classifies customer preferences into five categories:

1. **Attractive quality**—These attributes relate to customer surprise and delight (i.e., they create high levels of customer satisfaction when achieved, but do not cause dissatisfaction when not achieved). These attributes are not usually expected (e.g., free valet parking at a hospital) and often are not verbalized by customers. W. Edwards Deming's statement, "The customer never asked Mr. Edison for a light bulb" provides an example of an unspoken feature. This dimension is often ignored, since it is usually difficult to ascertain.

2. **One-dimensional quality**—Quality attributes that result in satisfaction when fulfilled and dissatisfaction when not fulfilled are considered one-dimensional and are generally articulated by customers. Consider the dissatisfaction that travelers feel when a flight that is scheduled for 2:00 p.m. is delayed for two hours because of a mechanical problem on the airplane. These factors are sources of competitive advantage for high performing organizations.
3. **Must-be quality**—Customers view must-be attributes as inherent in the product or service, and when not present, customer dissatisfaction is quick and serious. For example, a patient scheduled for a visit with a specific doctor will not be any more or less satisfied when the doctor enters the room, but will be dissatisfied if another doctor appears instead. These attributes are also usually not communicated by customers, since they are part of a basic expectation of the service or product feature.
4. **Indifferent quality**—Indifferent quality refers to aspects that are neither good nor bad, and, consequently, they do not result in either customer satisfaction or customer dissatisfaction.
5. **Reverse quality**—In this domain, presence of an attribute creates dissatisfaction, and absence is associated with satisfaction, which emphasizes the fact that not all customers are alike. For example, some patients may like the use of advanced diagnostic instruments like PET scanners, while others may find the technology intimidating and unsatisfying.

A summary of these characteristics can be found in **Table 2-3**.

Table 2-3 Kano model quality categories

Quality category	Attribute present		Attribute absent	
	Satisfaction	Dissatisfaction	Satisfaction	Dissatisfaction
Attractive	↑↑	↔	↔	↔
One-dimensional	↑	↓	↓	↑
Must-be	↔	↔	↓↓	↑↑
Indifferent	↔	↔	↔	↔
Reverse	↓	↑	↑	↓

Procedure for Kano Model process

Kano model analysis really can be reduced to asking two basic questions about each attribute:

1. Rate your satisfaction if the product has this attribute?
2. Rate your satisfaction if the product did not have this attribute?

Responses to the questions should be one of the following:

- Very satisfied
- Satisfied
- Neutral (don't care)
- Dissatisfied
- Very dissatisfied

The procedure for conducting a Kano Model analysis involves the following:

1. Determine which product or service attributes are to be included in the analysis.
2. If the attribute is new or not well understood, consider writing a short summary of the attribute without adding judgmental language (e.g., we think this will improve the use of the product).
3. Determine the method of obtaining customer feedback. Surveys may be done in paper format, online via a Web site, through focus groups, or telephone.
4. Create the survey instrument using the questions and response levels above.
5. Field the survey and collect results.
6. Analyze the results using a Kano Model graph similar to **Figure 2-2** to determine if the attribute is one that produces sufficient customer satisfaction to warrant allocation of resources to ensuring the attribute's presence. Attributes that create customer delight generally receive more resources, while those that fall into the indifferent or reverse quality categories may be quickly eliminated.

The Kano Model helps prioritize specific product or service attributes so that the team can concentrate time and resources on those issues that will create the greatest traction with customers.

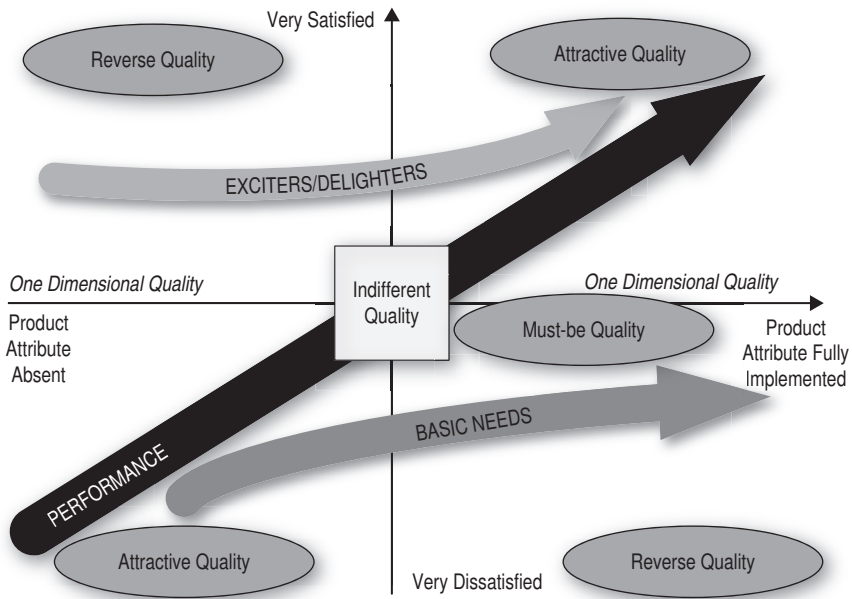


FIGURE 2-2 Kano Model

Tips and tricks

1. The team must try to quantify the attribute by extent of deployment. Using a five-point scale from “not deployed” to “fully deployed.” The resulting value is then combined with the customer value from the survey to produce a point on the Kano Model graph.
2. The Kano Model graph demonstrates the three major areas of Attractive, One-Dimensional, and Must-be quality. Note that the Indifferent quality is represented by points clustered around the intersection of the x- and y-axes, and Reverse quality points would be reflected by a point that is very low on the customer satisfaction score, while Reverse quality points would be found in the lower right quadrant of the graph.
3. Basic attributes generally receive the “Neutral” response to Question 1 and the “Dissatisfied” response to Question 2. Exclusion of these attributes in the product may have a negative impact on the success of the product in the marketplace.

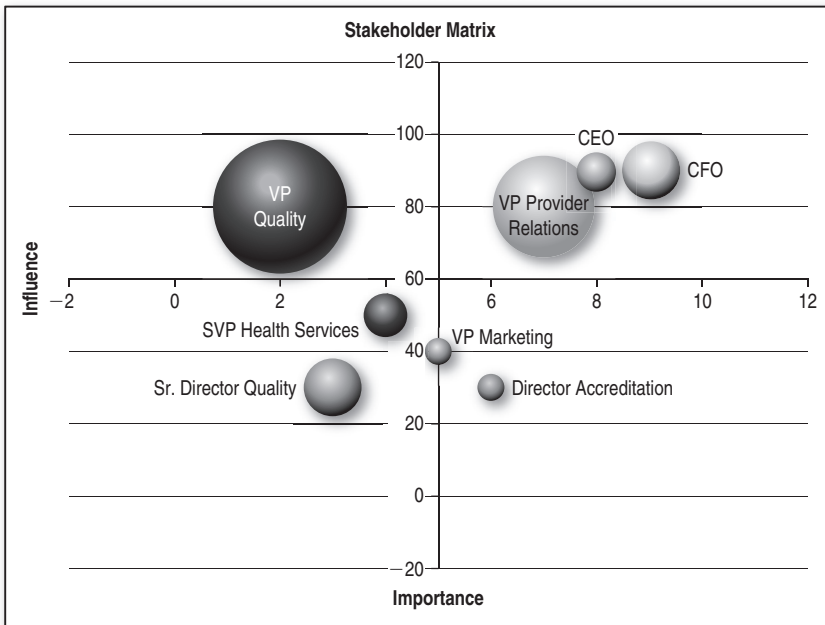
4. The Kano Model can be used in a number of circumstances other than just evaluation of product attributes. For example, customers may be surveyed about proposed attributes of a new product or service and a Kano Model graph can be created. In this type of analysis, the customer is presented with varying levels of the attribute in a product or service and asked the two questions. The ratings from the survey are then plotted as described previously.
5. Inclusion of performance or excitement attributes often requires a trade-off analysis against cost. Since customers frequently rate attributes or functionality as important, the first question may be rephrased, “How much extra would you be willing to pay to add or increase the amount of this attribute?” This information may be better to help a team prioritize new attributes or increases in existing attributes and begin to calculate a return on investment.
6. Neutral or “Don’t Care” responses usually imply that the attribute will neither increase customer satisfaction nor motivate the customer to pay an increased price for the product. Although it is tempting to simply dismiss these attributes, they may in fact serve an essential purpose for the product and may not be summarily eliminated. For example, the preoperative stop that is now required for surgical procedures to verify patient identity and surgical details may not be something for which a patient may be willing to pay, but it serves a useful purpose in reducing errors.

The information obtained from the Kano Model analysis, specifically regarding performance and excitement attributes, provides valuable input for quality teams as well as for strategic planning and process improvement. Designing the analytic tools requires forethought and some skill, and the results can help clarify customer requirements for product and service offerings.

STAKEHOLDER ANALYSIS

Fundamental change in a process requires buy-in and support from multiple sources, including executive leaders, senior managers, people in the department(s) being affected, suppliers, and customers. One of the first

evaluations that a team will perform in preparing for a project is determining the important stakeholders. The team must consider everyone who might have an interest in the change and determine how they might react to the new process. A method of stratifying stakeholders in terms of importance to the project and influence on the outcome can be useful to anticipate how to manage expectations and which stakeholders will require greater attention. Additionally, an importance-influence matrix can graphically demonstrate who is most important to the project and who can be expected to exert influence to ensure project success. An example stakeholder matrix is shown in **Figure 2-3**.



Stakeholder	Importance	Influence	Magnitude
VP Quality	80	80	6400
Sr. Director Quality	90	30	2700
SVP Health Services	40	50	2000
VP Marketing	30	40	1200
Director Accreditation	40	30	1200
VP Provider Relations	60	80	4800
CEO	20	90	1800
CFO	30	90	2700

FIGURE 2-3 Stakeholder matrix

Procedure for stakeholder analysis and diagram

1. Assemble team to determine stakeholders for project.
2. Create a list of potential stakeholders for the project.
3. Create a survey instrument that ranks each stakeholder on two dimensions: importance to the project and influence on the project.
4. Allow the team to rank each stakeholder on the two dimensions on a Likert scale (usually 1–9).
5. Enter the scores into a spreadsheet and average the rank scores for each stakeholder in each domain to create a table like that shown in Figure 2-3. Note the column labeled “Magnitude,” which is the product of the two scores for importance and influence. The magnitude parameter determines the “size” of the bubble on the matrix.
6. Create a bubble chart like that shown in Figure 2-3 from the table by selecting the chart from the list of potential charts in Excel® using all three columns of data.

Tips and tricks

1. If there is a chance that the stakeholder may have a negative influence on the project, the scale can be expanded to include negative numbers. For example, the Likert scale might range from -5 to +5, rather than 0 to 9.
2. The scale can be expanded (as shown in Figure 2-3) to any size (e.g., 0 to 100). Wider scales provide more choices and often avoid situations in which people may want to use 2.5 or 3.8 values.
3. Excel provides a method of placing text labels on each bubble as in Figure 2-3. The precise technique can be found in Excel Help in the topic “Add data labels to a chart” under the subtopic “Create a custom label entry.”

PROCESS MAPPING

Process mapping is a method of producing a workflow diagram that provides a graphic description of a process and related subprocesses. Process maps are ubiquitous tools for quality improvement teams to provide all stakeholders with a rapidly assimilated view of the process, as well as to hone in on specific steps that contribute to process variation or nonvalue added work. Process flowcharts are the result of the process mapping approach.

Procedure for creating a process flowchart

1. Determine boundaries—establish the starting and ending points for the process
2. List the process steps—the level of detail depends on the use of the flow diagram; for example, if the flowchart is to be used to provide an overview for senior managers, less detail will be needed than if it is to be used by a process improvement team to find intervention points.
3. Put the steps in time sequence—the steps identified above should be placed in order based on when they occur in the process. Some may occur in parallel, while others will follow an ordered pattern. Many teams perform this task using a whiteboard or small notepaper, but it can just as easily be accomplished with a software program like Microsoft Visio®.
4. Draw the flowchart using appropriate symbols—flowcharting has a number of symbols to represent specific types of process steps, as shown in **Figure 2-4**. Although hundreds of flowchart symbols

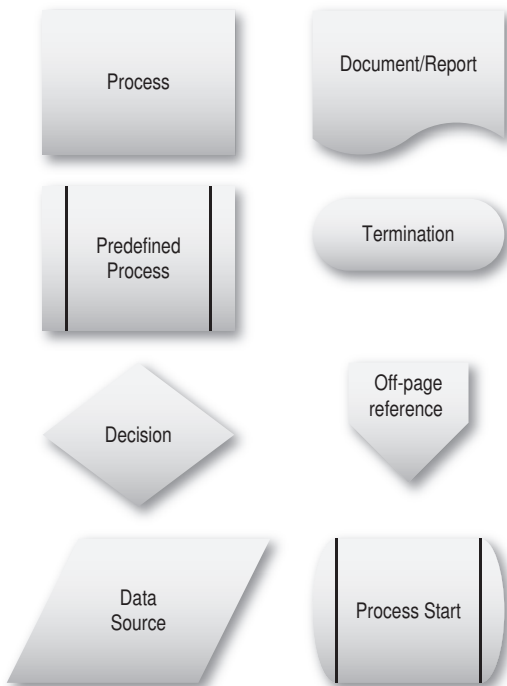


FIGURE 2-4 Basic Flowchart Symbols

are available in software programs, the basic symbols in Figure 2-4 should suffice for most situations.

5. Obtain feedback on the flowchart from process owners and users—ensure that process owners and key process users agree with the flowchart before finalizing. It is often helpful to have a formal review process and sign off as a criterion for flowchart adoption.
6. Finalize the flowchart and distribute to appropriate stakeholders. The resulting flowchart should resemble the chart shown in **Figure 2-5**.

Tips and tricks

1. Flowcharts benefit from both process user input and direct observation. Process users often have a concept of the process that may not conform to reality (i.e., because of constraints in the process, “workarounds” have become incorporated into the process flow that are now second nature to everyone involved). Thus, part of process mapping may involve a “walk through” of the process to try to detect variation that should be incorporated into the process map.

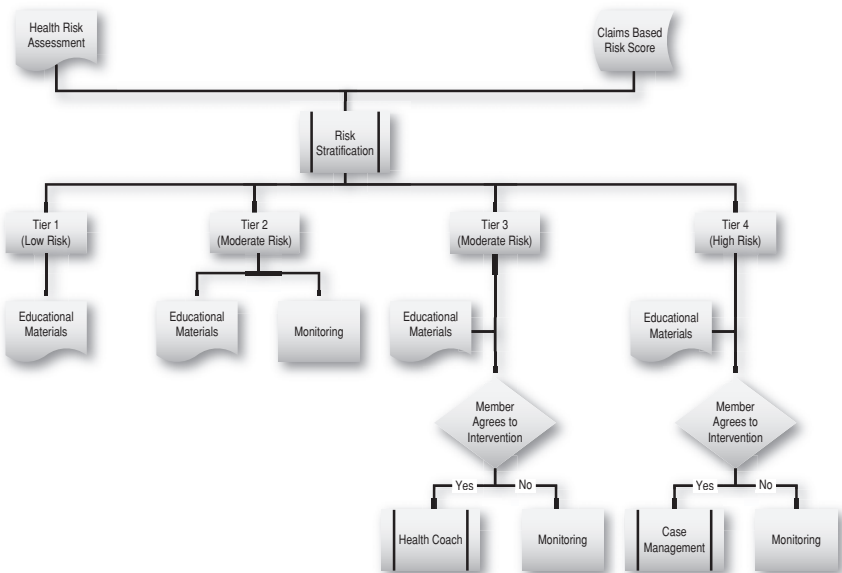


FIGURE 2-5 Basic flowchart for diabetic care management program

2. The process map can be created individually or as a group. Although the group approach often takes more time, it usually offsets the time gaining feedback from stakeholders on a flowchart created by an individual.
3. Many teams create two flowcharts during this stage: one for the current state and one for the ideal state. The current state flowchart details the process in its present condition, complete with workarounds and other variation, while the ideal state flowchart provides the best possible process flow with variation and workarounds either removed or revised to accommodate ideal process flow.

SIPOC PROCESS MAP

SIPOC is an acronym for **S**uppliers, **I**nputs, **P**rocess, **O**utput, and **C**ustomers and is used as a general description of the major process domains. In most cases, quality will be judged by the output of a process, but in process measures are used to gauge the efficiency and effectiveness of the process. Process outputs in a healthcare situation are usually services, such as a lab test or an imaging study or a diagnosis and subsequent treatment plan. In some cases, the quality of an output is difficult to assess, such as in a complex diagnostic situation when the output (diagnosis) is tentative and may take time to unfold. In many of these cases, output is measured indirectly by patient satisfaction with the outcome, rather than the accuracy of the outcome. In any case, efforts to improve output quality are directed at the preceding domains—suppliers, inputs, and process. Thus, understanding each of these components is important to any improvement project. An example of a SIPOC process map for performing a laboratory test is shown in **Figure 2-6**. The SIPOC process map is the high level overview of the process and allows a project planner to have a quick understanding of the major components of the process.

Procedure for SIPOC process map

1. Identify suppliers, inputs, the basic process flow, outputs, and customers.
2. Using the template in **Figure 2-7** (created in Microsoft Visio), place each of the components into the appropriate column. Create a

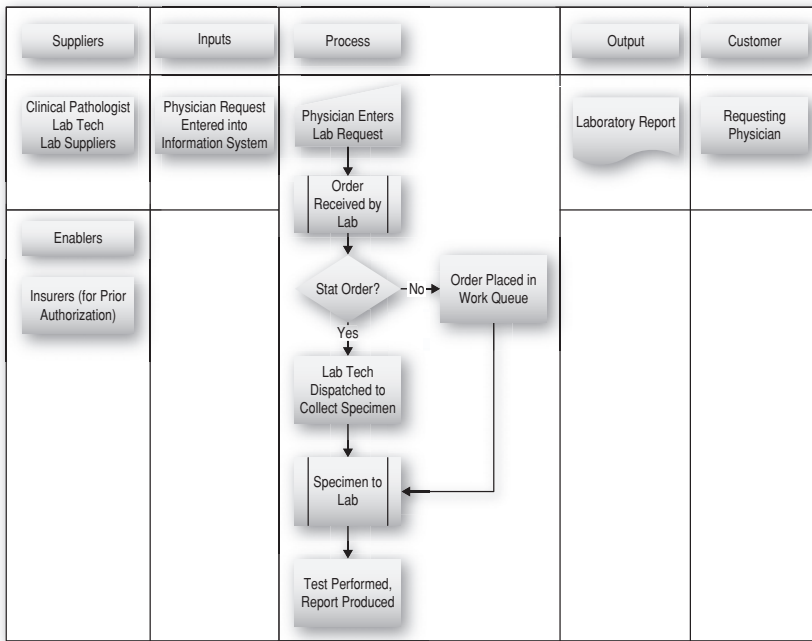


FIGURE 2-6 SIPOC Process Map

high-level process flowchart for the process column using a flow-charting tool like Visio

3. Add details if needed, such as enablers. For example, if an insurer must authorize a test before it is performed, then the insurer could be considered an enabler under “suppliers.”

Tips and tricks

1. The process flowchart for the SIPOC process map does not usually have the same level of detail as a value stream map or working flow-chart. The SIPOC diagram is often paired with a traditional flow-chart that shows much more detail for in-depth process analysis.
2. Identifying the entries for each domain can usually be done through brainstorming with the well-formed team, but it also can be performed by a “walk around” observation of the process if ambiguities persist after the brainstorming session.

BRAINSTORMING, BRAINWRITING, AND NOMINAL GROUP TECHNIQUE

Brainstorming and its variants, brainwriting and nominal group technique (NGT), are the most commonly used approaches to generating large numbers of ideas in a relatively short period of time. Nearly everyone has participated in a brainstorming session at one time or another, but it is likely that the level of preparation and planning that go into a successful brainstorming exercise may not be evident to participants. Brainstorming relies on group participation, and if a group is reticent or does not perform collaboratively, the other two approaches (brainwriting or NGT) may be preferable.

Brainstorming sessions strive for volumes of ideas, not necessarily high quality suggestions, and certainly not fully formed plans. Some brainstormed ideas fail to survive later scrutiny and analysis, and so everyone in the session needs to know that any idea should be brought to the fore, regardless of how outlandish it might sound at the time. Another important principle underlying brainstorming is the absolute need to eliminate any criticism of new ideas during the session. Participants must feel free to express ideas in a noncritical, supportive environment, or the likelihood of gaining any new insights will be severely limited. If the group is unable to perform in this manner, then brainwriting or NGT may be more effective approaches. Finally, members of the brainstorming team should feel free to build on others' ideas. In other words, if other team members can add to an idea that has already been presented, they should be encouraged to do so. The synergies achieved in this way can often be beneficial to the final product.

Procedure for brainstorming

These sessions should be led by someone experienced in the technique. The leader must prepare for the session as follows:

- **Creation of a clear problem definition**—the problem should be stated as clearly as possible, with specific questions, (e.g., “How can we streamline laboratory flow to improve turnaround time?”). Brainstorming sessions benefit from the specificity of the problem statement, since participants can focus on specific ideas that are germane to the issue.
- **Summarize background**—the group will usually require a basic understanding of the problem; although participants are selected for their expertise in the issue, a summary of the fundamental issues surrounding the topic will help the group stay focused.

- **Select appropriate participants**—as noted previously, participants must be selected for their expertise and understanding of the issue to be discussed, and the three types of participants are usually managers, process owners, and customers of the process. In some cases, that group may include external customers, but usually the group consists of participants internal to the organization.
- **Prepare for the session**—ensure that all materials are prepared for the session and secure a location that facilitates the brainstorming process. Locations usually involve privacy and low levels of distractions, comfortable, and easily accessible for participants. Additionally, the leader should prepare for the situation in which group members lose focus and may require directed questions to consider in the process. For example, the leader may want to have questions ready like “What if a lab machine breaks? How should the process flow be modified?” or “How does the lab process flow accommodate emergencies?” The session leader should also ensure that all necessary supplies (timer, recording medium like a whiteboard or flipchart) are ready for the session.
- **Conduct the session**—the session leader must conduct the session according to the rules of the brainstorming process outlined previously. Participants must feel empowered to express themselves freely in a nonthreatening environment, and they must feel that every opinion is valued by the team. Conducting the session is straightforward:
 - Assemble the team for the session
 - Briefly describe the problem and the process and then discuss any questions about either topic
 - Identify a timekeeper and a scribe to take down ideas as they occur
 - Open the session for ideas. In most cases, setting a 10-minute time limit for each round of idea generation helps the group from becoming discouraged. Conduct as many 10-minute rounds as needed to exhaust new ideas
 - Tally the ideas for the group to review and for use in the next phase, which is often “list reduction,” described later.

Variants—brainwriting and nominal group technique (NGT)

Brainwriting is used when brainstorming is hampered by poor group dynamics, such as one or two dominant participants or a particularly difficult subject for discussion. Brainwriting is similar to Nominal Group Technique as a method of getting information from participants that may

not be willing to share. The two techniques are similar in that participants write their ideas on a sheet of paper, rather than expressing them verbally in the group. The differences between the two approaches are listed in **Table 2-4**. One interesting variant of the brainwriting procedure is the use of diagrams instead of word descriptions for idea generation; thus, if a product design is the subject of the brainstorming session, participants might use figures or diagrams on the brainwriting sheets rather than describe the design in words.

Multivoting

Once the brainstorming session is completed, the large number of ideas needs to be reduced to a manageable few, and two methods of performing this task are multivoting and affinity diagrams. This section discusses multivoting, which is preferable to a single up and down vote on each idea because it allows an idea that is favored by all team members, but perhaps not the top choice of any of the group, to rise to the top of the priority list. Additionally, the group can consider the complete list and any potential synergies during a multivoting exercise, which provides some context around the voting. Multivoting is useful as a group tool to narrow a long list of possibilities into a manageable, prioritized subset.

Procedure for multivoting

Supply each team member with 10 slips of paper and a pencil, and have a whiteboard or flipchart to use for listing all of the options and recording votes. The facilitator should decide how many items can be on the final reduced list. In general, up to ten rounds of voting may be necessary to reach the final tally, but in most cases, only four or five rounds are usually needed to reduce a list.

1. Display the list of options and combine any obviously duplicated items.
2. Number the items on the list.
3. Working individually, each team member selects five items that he or she feels are most important and then ranks the choices in order of priority, with the first choice ranking highest. Each choice is written on a separate piece of paper, with the ranking underlined in the lower right corner.

Table 2-4 Comparison of brainwriting and NGT

	Brainwriting	NGT
Participant factors	<ul style="list-style-type: none">• Some group members are substantially more vocal than others• Some group members think better in silence• Some group members may not participate due to shyness or a feeling of intimidation• All or some team members are new to the effort• The issue is controversial or has created conflict within the organization	<ul style="list-style-type: none">• Some group members are substantially more vocal than others• Some group members think better in silence• Some group members may not participate due to shyness or a feeling of intimidation• All or some team members are new to the effort• The issue is controversial or has created conflict within the organization
Procedure	<ul style="list-style-type: none">• Clearly state the subject of the brainstorming exercise and ensure that everyone understands the issue• Hand out a sheet of paper to each participant• Each team member begins writing ideas on the page, usually for 1–2 minutes• At the end of the allotted time each person passes his/her sheet to the left• The next person reviews the prior person's work and adds new ideas to the sheet that enhance the initial idea or create a completely new subject• The cycle is repeated until the pages are filled and everyone has had the opportunity to see every sheet• After a few cycles, have team members read the best idea from all ideas on the page in front of them• The facilitator lists these ideas on the flipchart or white board for further discussion and clarification• The ideas are prioritized using list reduction techniques like multivoting, in which the ideas are ranked by group members in successive secret ballots until the list is narrowed to three or four choices	<ul style="list-style-type: none">• Clearly state the subject of the brainstorming exercise and ensure that everyone understands the issue• Allow 5–10 minutes for each team member to individually write down ideas: as with any brainstorming exercise, volume is more important than content• Gather the group together and have each team member read one idea to the rest of the group; the facilitator records each idea on a flipchart or whiteboard:<ul style="list-style-type: none">o No discussion is allowed during the idea sharingo As the exercise proceeds, ideas may be generated spontaneously and not from the team members' listso Team members may "pass" his or her turn, and may then add an idea on a subsequent turn.o Set a time limit for the idea sharing and stop when the limit has been reached or when everyone has used all of their ideas• The facilitator leads discussion of each idea, with the following rules:<ul style="list-style-type: none">o Originator of an idea must agree to wording changeso Ideas may be eliminated only by unanimous voteo Group discussion should focus on clarifying meaning, explaining the idea, or answering questions• Ideas should be prioritized by the group using list reduction techniques like multivoting

4. The facilitator collects the papers, shuffles them, and then records the tally on the flipchart or whiteboard. It is usually best to have a scribe record the individual rankings next to each item, and then to total the rankings for each selection.
5. If a decision is clear after any of the voting rounds, the process may stop. Otherwise, the facilitator conducts a brief discussion of the vote to review the voting data, emphasizing those items with large ranges in ranking (e.g., votes of both 1 and 5 ratings), to identify any apparent misunderstandings of each item. The discussion should not produce pressure on anyone in the group to change their vote.

Example 2-2 Multivoting

A hospital team from three departments was tasked with developing a list of key customers to contact regarding a new service. The group brainstormed a list of 32 possible names, which exceeded the limit of funding that had been budgeted. To reduce the list to the budgeted number of 18 potential contacts, the group used multivoting to identify the top 18 candidates. A facilitator conducted the exercise according to the procedure outlined in the text, and during each voting round, group members selected six names to be prioritized. After the third round of voting, the list had been successfully narrowed to 18 names with rankings to guide the outreach efforts. The top ten customers had fairly homogeneous voting scores, but the remaining eight scores had a broader distribution of votes, indicating less agreement of the group on the priority scores for the last eight customers.

Affinity diagrams

An affinity diagram graphically represents large numbers of ideas, opinions, or issues in a framework that demonstrates natural groupings. The diagram is created using the affinity process, which is conducted after brainstorming or one of its variants. This approach can be used as an alternative to multivoting, or it can be used before multivoting when a list of possibilities is so long that it is unmanageable. Two particular situations lend themselves to the affinity process:

- Sifting through large volumes of data to find patterns—for example to categorize a population of patients into demographic categories for further analysis of utilization patterns.
- Encouraging new patterns of thinking—the affinity process encourages people to think quickly and creatively, and so may help team members find new perspectives on a problem. The use of brainstorming as the first step in the affinity process ensures “out of the box” thinking if done properly.

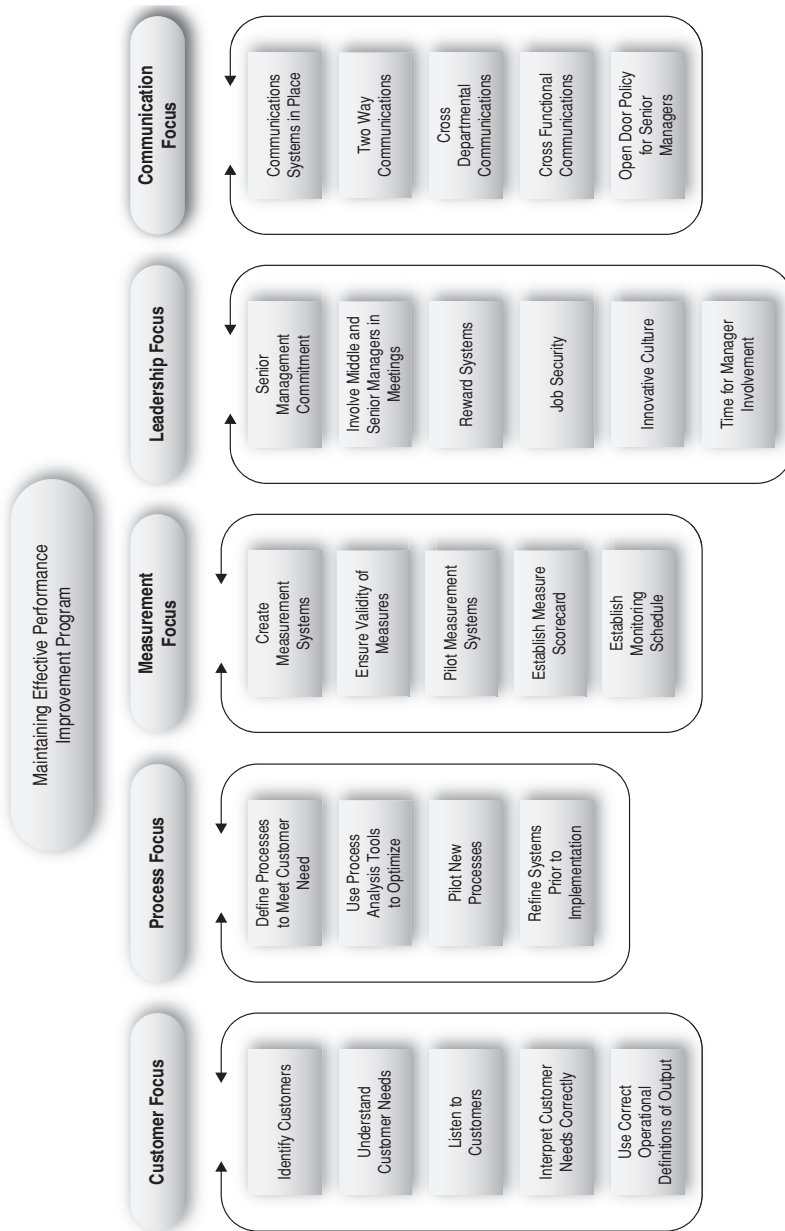


FIGURE 2-7 Affinity Diagram

In general, if fewer than fifteen items of information have been identified as the target data set, the affinity process may be unnecessary. This process has been credited to Jiro Kawakita,⁴ who published the approach in the 1960s, and so affinity diagrams are often known as KJs in his honor.

Procedure for creating an affinity diagram

Underlying principles include the following:

- The affinity process is best performed silently. As the process unfolds, the likelihood of disagreements rises, and allowing discussion may divert attention to the overall task at hand.
- Constitute the group from people who understand the issues well and can discern the underlying relationships.
- Limit the group size to five or six participants.
- Encourage team members to use their initial reactions to groupings, rather than agonize over decisions. Gradual movement toward consensus will usually require an iterative process.
- Disagreements over classification are handled simply. If team members cannot agree on a position for one of the ideas within a single classification, the idea is duplicated on another sheet of paper and put under other categories until the team debriefs and resolves the conflict.

The affinity process is conducted as follows:

1. Conduct the brainstorming (or variant) session to generate a list of ideas. Write the ideas on individual pieces of paper (such as Post-it Notes) for use by the team members in the next step.
2. Post the ideas randomly on the wall for everyone to view. Avoid trying to “pre-categorize” the ideas by grouping them in any order.
3. Without conversation, the team then can place the ideas into related groupings in the following manner:
 - Find two ideas that seem related in some way and place them in a column off to one side of the wall.
 - Seek other ideas that seem related to those already selected and put aside, and then add them to that group.

- Repeat the process until all of the ideas have been used in some group.
 - If some ideas are left as “mavericks,” leave them in their own groups-of-one at this stage.
4. Create header cards for each group that capture the essential link among the ideas contained in the group. The header card may contain a short explanation of the grouping, as well as a simple title. Each header card is placed at the top of its respective group. Upon discussion, if two or more header cards seem to be related, they may be connected by a “superheader” card that is placed above those header cards. At this point, the group may engage in discussion to resolve some of the issues with ideas that have been placed in more than one group and the “mavericks.”
 5. Complete the exercise by drawing the affinity diagram like that in **Figure 2-7**.

Tips and tricks

1. Ensure that the ideas are not in any particular order when starting the affinity process. If the notes are in some order at the start of the exercise, team members may be influenced in their thinking about the groupings.
2. Allow plenty of time for step three. Some affinity processes have occurred over several days. For example, the idea notes could be posted in a public place and arranged by a large group of people over several days.
3. Use markers to complete the idea notes to improve visibility from a distance. If the affinity process session is held in a large room, the information must be visible from a distance.

CRITICAL-TO-QUALITY (CTQ) ANALYSIS

The methods for obtaining and organizing the Voice of the Customer represent the hallmarks of the Define Phase of a QI project. Once the surveys are completed or the brainstorming session has been conducted, however, a framework for understanding the VOC and converting it to actionable information is useful to provide direction to the project.

Critical-to-quality (CTQ) attributes are the key quantifiable customer requirements of a product or process that set performance standards or specification limits. CTQs help QI teams design initiatives that satisfy, or even delight, customers. One way of deriving CTQs from more general customer requirements is the CTQ tree.

Procedure for creating a CTQ tree

1. **Identify key customer requirements** using the methods outlined previously (i.e., customer surveys, brainstorming [or its variants], affinity diagrams, etc.). These requirements may be as broad as necessary to adequately capture the customer's needs.
2. **Refine requirements using customer data or team experience.** For example, if customer service is an issue, the surveys may have identified telephone response time as an issue. Similar to a Root Cause Analysis, the team then begins to break down the issue into its component process steps to determine which step(s) are problematic. The team completes this phase when quantifiable requirements are reached. Thus, if telephone response time is the problem, then the team may discover that the three quantifiable issues are call pick up time (CTQ = 2 rings), time-to-human response (CTQ = 2 layers of answers to automated response system questions), and time on hold (CTQ = 20 seconds). Those three elements form the branches of the CTQ tree (**Figure 2-8**), which is created in the same manner as other decision trees.
3. **Confirm the final requirements with customers** to ensure that the analysis has yielded results that are likely to produce a benefit. The confirmation process may involve another survey targeted to these issues, informal conversations with key customers, or focus groups of a representative customer cohort.

The CTQ tree helps translate customer language into quantifiable requirements that can be used to develop improvement initiatives that have measurable outcomes. As such, the CTQ tree ensures that a comprehensive view of customer needs is used to identify key elements, and that an improvement team can transform relatively general needs into measurable interventions.

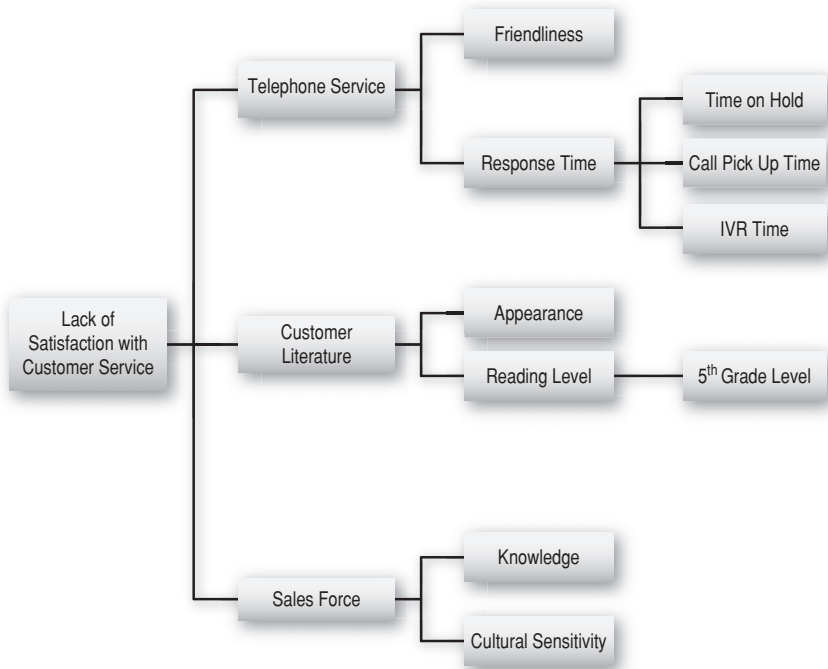


FIGURE 2-8 CTQ Tree

COMPLETION OF THE DEFINE PHASE

At the end of the Define Phase, the team should have completed all of the tasks listed in **Table 2-5**. These tasks serve as the basis for the next phase of the project, the Measure Phase.

Table 2-5 Define Phase checklist

Done	Task
✓	Business champion/leader identified
✓	Team composition complete
✓	Team members trained on appropriate improvement methods
✓	Team member participation documented through meeting minutes

Table 2-5 Define Phase checklist (*continued*)

Done	Task
✓	Project resources identified and secured
✓	Customers segmented and CTQs identified
✓	Initial data collection performed
✓	Project charter completed
✓	Process map complete
✓	SIPOC map complete and validated by team and managers

DISCUSSION QUESTIONS

1. Describe the project charter. What is the purpose of the project charter? List the major sections of the charter and provide a brief description of each.
2. What is the Voice of the Customer (VOC)? Name three approaches to obtaining the VOC.
3. How is the CAHPS survey used in health care to obtain the VOC? Name three advantages for using the CAHPS survey to understand customers.
4. Name three other methods of listening to customers and provide a brief description of each.
5. What is the Kano Model? How does it help define customer preferences?
6. How does stakeholder analysis support project success? What does a stakeholder matrix show?
7. Describe process mapping. What is the product of process mapping?
8. Create a flowchart of a process that you use in your work.
9. What is the function of the SIPOC process map? How does the map assist project managers with gaining manager buy in?
10. Brainstorming helps teams produce ideas quickly. Describe the brainstorming process and describe variants like brainwriting and nominal group technique. When are these variants appropriate?
11. Multivoting is a list reduction technique used after brainstorming. Describe the multivoting process and how it is applied to prioritization of ideas.

12. Create an affinity diagram after brainstorming for a problem or issue that your organization faces, or select an issue from the following list:
 - How can we improve the way students learn about quality?
 - What can be done about the state of readiness of students for graduation?
 - Why is our staff satisfaction below benchmarks?
 - What things do we need to consider in planning a perfect meeting?
 - What can be done to ensure proper disposal of recyclable material?
 - How can information flow be improved within our organization?
 - What can be done to ensure fast service at the pharmacy prescription counter?
 - What activities should we plan for the company Christmas party?
13. What is Critical to Quality (CTQ)? Describe the methods used to gain CTQ data and how a CTQ tree is created.

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