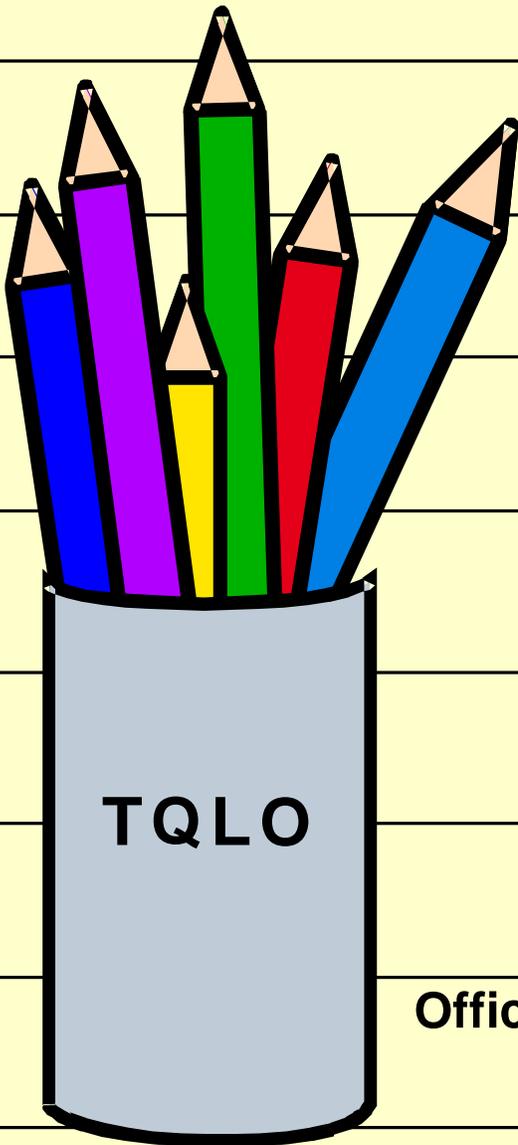


Survey Handbook



Archeater Houston, Ph.D.
Organizational Systems Division
Total Quality Leadership Office
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What is a Survey?

A survey is a systematic method of collecting information from a selected group of people by asking a series of questions. Surveys can be used to collect various types of information. They can collect information on people's behaviors, job performance, knowledge, preferences, attitudes, beliefs, feelings, etc. For a survey to provide useful information, care must be taken in its development and use reasons, including the cost in terms of time and money.

This handbook provides you with an overview of developing and conducting a survey. It also offers tips for writing or modifying survey items to meet your special needs. However, it will not make you an expert in survey development. It is strongly advised that you obtain professional assistance when possible, especially in survey design and statistical analysis.

When Should I Use a Survey?

Although surveys are a popular method of collecting data, they must be used under the appropriate conditions. Consider using a survey:

. . . when it is faster, easier, or less expensive to use than other methods. Sometimes other data collection methods are preferable. For example, to determine the number of people using a clinic, you can simply count the number of signatures on the sign-in sheet, or examine the daily records, rather than conducting a survey to obtain this information.

. . . when the information does not already exist in some form. Checking whether relevant and accurate data exist in archives, records, or databases can save a great deal of time, money, and effort. For example, before asking employees the names and dates of each course taken within the past year, consult their training files to obtain this information.

Preparing for a Survey

A number of issues should be resolved before drafting the first survey item. Use the following questions to help you in preparing for a survey:

What is the purpose of the survey?

Surveys can be used for many purposes, including:

- Determining customer needs/assessing customer satisfaction
- Identifying organizational strengths and weaknesses
- Targeting areas needing improvement
- Assessing the effectiveness of new or existing policies or programs

Without a clear purpose it is likely that the survey effort will flounder. This can result in wasted resources, useless data, and disappointment on the part of those who initiated the survey and those who responded to it.

Be very careful about conducting a survey “just to see what’s going on.” Conducting a survey can draw attention to an organization from the people who receive the survey and from those who learn that it is being conducted. This attention can lead to expectations that executive actions will soon follow.

Survey information can be valuable in guiding improvement efforts at the process, organizational, and systems level. Information on planning and conducting improvement efforts can be found in a variety of DON Total Quality Leadership publications, including:

- A Handbook for Strategic Planning* (Wells and Doherty, 1994)
- Strategic Management for Senior Leaders: A Handbook for Implementation* (Wells, 1996)
- A Total Quality Leadership Process Improvement Model* (Houston and Dockstader, 1993)
- Process Improvement Notebook* (Culbertson et. al., 1997)

Use these publications to assist you in determining and clarifying the information needs that would require a survey.

Who will use the results?

Identify who will be using the results of the survey and what their information needs are. What types of decisions are they going to make based on the results? How should the information be sorted for them? Do they need detailed responses or is the “big picture” sufficient? How do they prefer to have information presented to them?

What specific information is needed?

To meet the purpose of the survey, identify the topics or issues of interest and the forms of information needed. For example, if you are interested in maintaining equipment at an athletic center, then you might ask questions about how often people use the center, what facilities they use, and hours of use. You might also ask people to rate the quality of the swimming pool, treadmills, exercise machines, shower area, towel service, etc. If you are interested in meeting future needs, you might ask people to identify their anticipated physical fitness needs or interests. Each of these topics could be the subject of one or more survey items.

Who will be responsible for developing the survey?

Surveys are often developed by small teams. When considering membership, include individuals who have some knowledge of the topics or issues of interest. Also try to include individuals who have experience planning tools or graphic methods. If possible, have a member with experience in survey development and statistical analysis.

Who will be surveyed?

Identify the types of people who can provide the information you are interested in. Do they belong to a single rank or organizational level or do they come from a variety of ranks or levels? Do they work in the organization or are they end-users of the organization’s products or services?

How will the survey be administered?

There are several ways to conduct surveys. Examples include face-to-face interviews, telephone interviews, and written surveys. The latter include those conducted by mail, computer, and group sessions.

Select the method that will provide sufficient information as efficiently as possible. Interviews can provide very detailed information, but require special training to conduct effectively, can be time-consuming, and might be difficult to analyze and interpret. Interviews can be useful when you need

to collect detailed information from a relatively small group of people. Interviews can be used to explore issues and options to a greater extent than written surveys. Written surveys typically provide less detailed information, but can be used to collect large amounts of information in a relatively short period of time.

What resources will be needed?

Identify the staff and other resources required for the survey. Depending on the type of survey being conducted, resources can include a project manager, trained interviewers, statisticians, data analysts, printing costs, mailing costs, data entry, and data processing. Keep in mind that the people who respond to the survey should be considered as a resource in terms of number, time invested, and information provided.

What survey items will be used?

Based on the information requirements, determine if you can use an existing survey, modify an existing one, or if you need to develop an entirely new survey. (Developing survey items will be covered later.)

How will survey information be analyzed and reported?

Decide what methods will be used to summarize, interpret, and communicate the survey results. Data can be summarized with methods as simple as tallies, percentages, or averages. Depending on the decisions that are going to be made based on the survey information, more complex analytic methods might be appropriate. These more complex methods could involve analysis of variance to compare the results from different groups such as managers and employees or regression analysis to check the relationship between two variables such as job satisfaction and intent to leave the organization.

Decide how you will display the survey information. This decision should be influenced by the interests and preferences of the audience. Do they prefer simple graphs, statistical charts, or text summaries? The presentation format of results to executives who are considering policy changes might be different from that offered to external customers. If you need to present the results to different groups, consider tailoring the level of detail and data display methods to the different levels of interest.

How many people need to respond to the survey?

Due to limited resources, it might not be feasible to collect survey information from every member of a group you're interested in; for example, it would be very difficult and costly to survey every member of the Department of the Navy. Sampling is a technique used to determine the size and types of group subsets needed to provide representative information about the larger group. Obtain the help of someone skilled in sampling techniques when you try to determine how many survey respondents you need. Inappropriate samples can lead to misleading results, inaccurate interpretations, and ineffective actions.

If you have addressed the previous questions and decided that conducting a survey would be useful and feasible, then here are a set of activities to assist your effort. They include: constructing survey items, selecting response formats, reviewing items, creating survey introduction and instructions, pilot testing a survey, administering a survey, analyzing survey results, sampling, and communicating results and determining implications for improvement. These activities can be helpful whether you are creating a completely new survey or modifying an existing one.

Constructing Survey Items

Write survey questions for each topic of interest, jotting down whatever comes to mind. At the beginning it is better to have too many items than too few. Do not focus on writing the perfect question. It is more important at the beginning to cover all of the topics than to be elegant in phrasing. Consider using brainstorming, tree diagrams, and other idea-generation methods to create survey items. Individuals who have attended the DON TQM *Methods for Managing Quality* course should be familiar with them. Information on these methods can be found in *Memory Jogger II* (Brassard & Ritter, 1994).

Try to create items that are:

Clearly written. Statements should be short and easy to read. Do not use jargon, technical terms, or acronyms that are unfamiliar to the people answering the survey.

Concise. Get to the point as quickly as possible. Eliminate extraneous words or ideas, so the respondent can concentrate on the survey item without being distracted.

Specific. Focus on one idea at a time. Each item should collect information on a single behavior, attitude, opinion, event or subject.

Explicit. Do not force people to guess about what is being asked. Be sure they understand what information you want by explicitly stating so. If necessary, highlight or underline what is needed by way of an answer.

Selecting Response Formats

Along with the statements and questions, you need to provide methods for people to give their answers. Typically, survey items are used to ask people how much they *agree* with some statement, how *important* something is, or how *often* something happens. Here are some common types of survey response formats used to collect information:

Rating Scales. Surveys often ask that products or services be rated according to some scale. Some survey items present statements and ask people to rate how much they agree or disagree with the statements. Some examples of rating scales are presented below:

My supervisor encourages subordinates to participate in important decisions.

| | | | | | |
|------------------------------|-----------------|------------------------------|---------------------------|--------------|---------------------------|
| 1 | 2 | 3 | 4 | 5 | 6 |
| Strongly Disagree | Disagree | Slightly Disagree | Slightly Agree | Agree | Strongly Agree |

How satisfied are you with the service you received?

| | | | | |
|------------------------------|---------------------|----------------|------------------|---------------------------|
| 1 | 2 | 3 | 4 | 5 |
| Very Dissatisfied | Dissatisfied | Neutral | Satisfied | Very Satisfied |

Please rate the condition of the housing you were provided:

- 1 Bad, in need of total rehabilitation**
- 2 Very Poor, in need of several major repairs**
- 3 Poor, in need of at least one major repair**
- 4 Fair, in need of minor repairs**
- 5 Good Condition**
- 6 Excellent Condition**

When creating rating scales, be sure that the end points or anchors are equal and opposite in meaning. If that is not done, there is a risk of biasing the responses you get from the survey. For example, the following rating scale might provide answers you like, but not information you need:

| | | | | |
|-------------------------|-----------------------------|-----------------------|----------------------------|-------------------|
| 1 | 2 | 3 | 4 | 5 |
| Mostly Satisfied | Completely Satisfied | Very Satisfied | Extremely Satisfied | Raving Fan |

Ranking Items. Another common response choice is to ask respondents to rank-order a list of options in terms of some factor, such as importance. These data help to prioritize what is most important to respondents. Thus, if speed of service and cost for a restaurant on base are ranked higher than quality of food and variety on the menu, then efforts can be focused on those aspects most important to respondents.

Please rank the following five improvement objectives in terms of importance by marking a 1 next to the most important objective, a 2 next to the second most important objective, and so forth:

- Having a quick success**
- Increasing the amount of output**
- Reducing the price charged to customers**
- Reducing work backlog**
- Reducing the number of defects**

Selecting Options. This response format presents a list of statements or options and asks respondents to circle all that apply to them. This format is similar to the ranking question, but does not require survey respondents to put things in an order. This kind of question is easier to respond to than having to rank-order questions, for in many cases respondents cannot prioritize options when they feel that everything is of equal importance.

Please circle the numbers next to each of the graphic or statistical methods that your team has used to analyze process performance data:

- 1. Pareto diagrams**
- 2. Histograms**
- 3. Scatter diagrams**
- 4. Run charts**
- 5. Control charts**
- 6. Regression analysis**
- 7. Taguchi methods**

Comments and Open-ended Questions The fourth question/response type allows respondents to provide additional comments or other information in response to general questions. These questions usually leave blank space where respondents can write whatever is important in their own words and format. Examples are listed below.

Do you have any suggestions on how we can improve?

Are there any products or services you need that we do not currently provide?

Is there anything else you would like us to know?

This information can be very useful in understanding issues that have not been touched upon or to gather ideas and generate options for improvement. On the down side, responses to these types of questions can be difficult to interpret.

Demographic Questions Demographic information is typically used to segment respondents into smaller groups based on specific characteristics such as rank, age, or organizational level. This segmentation is important if one of the purposes of the survey is to determine if there are significant differences in responses between groups. The following are examples of demographic questions:

Which one of the following age categories do you currently fall in:

- Under 20**
- 20-29**
- 30-39**
- 40-49**
- 50-59**
- Over 59**

What is the highest educational level you have attained:

- Less than high school diploma or GED**
- High school diploma or GED**
- Associate Degree**
- Bachelor's Degree**
- Master's Degree**
- Doctoral Degree**

What is your martial status?

Single (never married)

Married

Divorced/Separated

Widowed

What is your current rank and pay grade? _____

What is your organizational level?

a. Directorate

b. Division Director

c. Branch Head

d. Section Head

e. First-line Supervisor

f. Non-Supervisory

Demographic items can be included that ask people to identify themselves, i.e., give their names or Social Security numbers. If you ask respondents to identify themselves in this manner, they might not feel comfortable providing honest feedback, particularly if it is “bad news.” To help reduce potential concerns about privacy, you should include a description of how the survey answers will be used and a promise to keep individual responses anonymous. For large or more formal surveys it might be appropriate to include a Privacy Act Statement. The statement should read as follows:

Public Law 93-579, the Privacy Act of 1974 requires that you be informed of the purposes and uses to be made of the survey. Authority to collect this information is granted in Title 5 of the United States Code. Providing this information is voluntary. The information will be used for statistical purposes only. In no case will the information be used for making decisions affecting specific individuals.

Reviewing Items

After you have developed a set of potential survey items and response scales, review them to make sure that they are:

Relevant to the purpose of the survey. Items that stray from the purpose will *not* provide the information needed. Be sure to have a specific reason for why an item is being asked in a survey. Always focus on the purpose of the survey and the type of information that will be needed to support that purpose. Carefully compare the items to your survey purpose to ensure that they address the issues that have been identified.

Appropriate for the individuals being surveyed. Do not include items that people do not have the knowledge to answer. For example, store customers could probably answer questions about a store's layout; but they would not be able to answer questions about a store's compliance with fire regulations.

Capable of providing the appropriate type of results. Think ahead to how the information will be summarized. The summary of results should provide the types and level of information required by the survey users. Will the results be presented in simple bar graphs or subjected to advanced analysis? How much detail will be required to meet the information needs of those using the survey? For instance, if the survey users are interested in general impressions, there is little reason to present averages calculated to the seventh decimal point. On the other hand, if the survey users need to make precise distinctions among quality features, then just providing a list of verbatim comments is not going to be helpful either.

Eliminate items that are inappropriate or redundant and clarify items that are unclear. Check items to ensure that they are not:

Ambiguous. Avoid words or phrases that can be misinterpreted.

Do you enjoy exciting tours?

This organization is energetic and active.

Overlapping. Avoid presenting response choices that overlap. Overlapping choices can lead to confusion on the part of the respondent and difficulty in interpreting information.

Circle the number that best represents the number of hours per week you spend on physical readiness training:

- 1. None at all**
- 2. Less than one hour per week**
- 3. One to two hours per week**
- 4. Two to three hours per week**
- 5. Three to four hours per week**
- 6. Four or more hours per week**

Double-barreled. Avoid having respondents address two different issues in the same item.

The clerk listened to me carefully and took a short time to handle my request.

Evaluate the presence and quality of the listed statements with the following scale. You will provide a single response for each statement by circling the appropriate number. Use your discretion to balance the presence/quality response.

| | | | | | | | | | | |
|------------------|--------------------|----------|----------|---------------------|----------|----------|-------------------------------|----------|----------|-----------|
| Presence: | None | | | Partially | | | Organization- Wide | | | |
| 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| Quality: | No | | | Satisfactory | | | Excellent | | | |
| | Performance | | | | | | | | | |

Leading. Avoid giving clues that point to the desired answer, or limiting the answers to those desired.

Do you feel that you are being forced to pay too much for daycare services?

Redundant. Avoid asking the same question more than once.

Rewrite or delete inappropriate or repetitive items. Then review the remaining ones for clarity and to ensure that they can collect the information required. In addition to reviewing the items yourself, you might consider conducting a pilot test of the survey.

Survey Introduction and Instructions

Surveys usually have a short introduction explaining the purpose of the survey and how the data will be used. Sometimes this information is explained in a cover letter attached to the survey. Short instructions on how to complete the survey usually follow the introduction. Sometimes an example is provided to show how to mark response boxes or fill out an answer sheet. If demographic items are in the survey, provide a statement to reassure people that their responses will remain anonymous. That statement can be reinforced by adding the Privacy Act Statement (presented in the section on demographics) to the end of the instructions. Be sure to give people instructions on how, when, and where they are to return the completed survey.

Pilot Testing a Survey

After you have a draft survey, you can conduct a pilot test to further check and refine the survey. Pilot testing involves trying out a survey before wide-scale distribution to make sure it is easy to understand and provides appropriate data. Pilot testing is usually done with a small group of respondents who are representative of the larger group. If you choose to conduct a pilot test, consider taking the following steps:

Explain the process. Gather together the group who will be pilot testing the survey. Briefly explain that they are to evaluate the survey as they are taking it and identify questions that are unclear, topics that are missing, and suggestions about improvements.

Request written comments. Ask people to make notes on the survey where they have questions or comments. Some individuals will not feel comfortable discussing survey problems with the group, but will provide written feedback. Collect the completed surveys at the end of the meeting and review any written comments provided.

Measure time requirements. Time how long it takes people to complete the survey. Use this information to determine if the survey is too long, or if it could be expanded in length.

Hold a group discussion. After everyone has completed the survey, review each section of the survey with the group to gather feedback. Record the information and study it after the pilot testing session. Sometimes comments that do not seem to represent a good idea initially can, upon further reflection, be very useful. Ask if important issues or satisfaction areas were left off the survey. Also ask if there are any other demographic questions that need to be added to the survey.

Use the information obtained through the pilot test to modify the survey. Modifications could involve rewriting items to increase their clarity, eliminating items that do not provide relevant information, or adding items to obtain more complete information on important issues. Once you have a final version of the survey and have identified the sample, it is time to administer the survey.

Administering the Survey

Two common methods of administering written surveys are by mail and in-person. Here are some things to consider when using one or the other.

Mail-Out Surveys. The most common method of administration is to mail surveys to the customer sample with a stamped, business reply envelope. Remember to budget for postage costs, which can be substantial if several thousand surveys are being mailed. When using the mail-out process, allow time for the survey to get to its destination, time for the respondent to complete it, and time for the survey to be returned. Surveys mailed to distant (i.e., overseas) addresses might require 2-16 weeks for their return. Local surveys might take 2-3 weeks to come back.

In-Person Surveys. In-person surveys can be done in different ways. One format is to ask respondents to complete on-the-spot surveys as they receive products or services from the organization. Only very short surveys are practical in this type of situation. The survey administrator usually stands by as the

customer completes the survey and might give the customer some small token of appreciation for completing the survey. A second format is to ask respondents to come to a particular location to complete a customer survey. A third format is to visit respondents at their work sites and ask them to complete the customer satisfaction survey.

Analyzing the Survey Results

After surveys have been administered, you need to summarize, analyze, and interpret the results. This requires sorting and consolidating individual responses to survey items so that they can be more easily displayed and understood. Some common methods of summarizing and analyzing are presented next. See Brassard (1988), Brassard and Ritter (1994), and the *DONToolkit* (1996) for more information about these and other methods.

Frequency distributions. Frequency distributions are a very simple method of displaying the variation in responses to survey items. These distributions can be developed by counting and recording answers according to the response scales used in the survey. Frequency distributions are typically presented as tables or bar graphs for ease of interpretation.

| | 1 Very Dissatisfied | 2 Dissatisfied | 3 Neutral | 4 Satisfied | 5 Very Satisfied |
|--|------------------------|-------------------|--------------|----------------|---------------------|
| Availability of technical support | 3 | 14 | 3 | 30 | 50 |
| Responsiveness of technical support | 10 | 15 | 2 | 45 | 28 |
| Time to complete technical support service | 1 | 3 | 0 | 88 | 8 |
| Courtesy shown by technical support provider | 17 | 70 | 0 | 7 | 6 |

Figure 1. Example of a table showing a frequency distribution of responses to survey items.

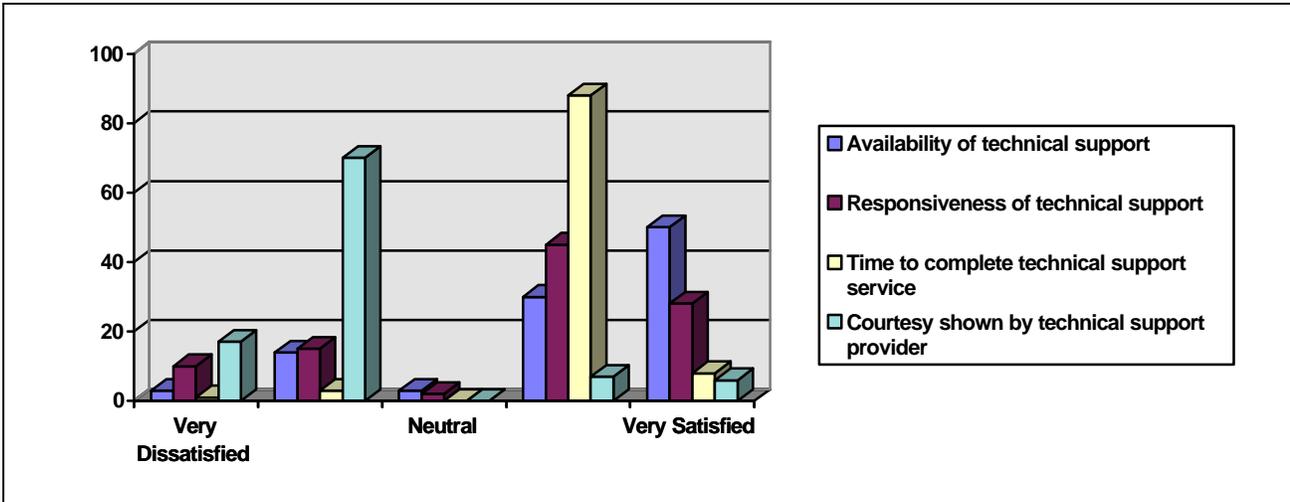


Figure 2. Example of a frequency distribution presented in a bar graph.

Percentages. One of the simplest ways to summarize survey information is with percentages. Percentages are calculated by dividing the total of a specific response choice by the total number of responses and multiplying by 100. Percentages can be displayed using tables, bar graphs, or pie charts.

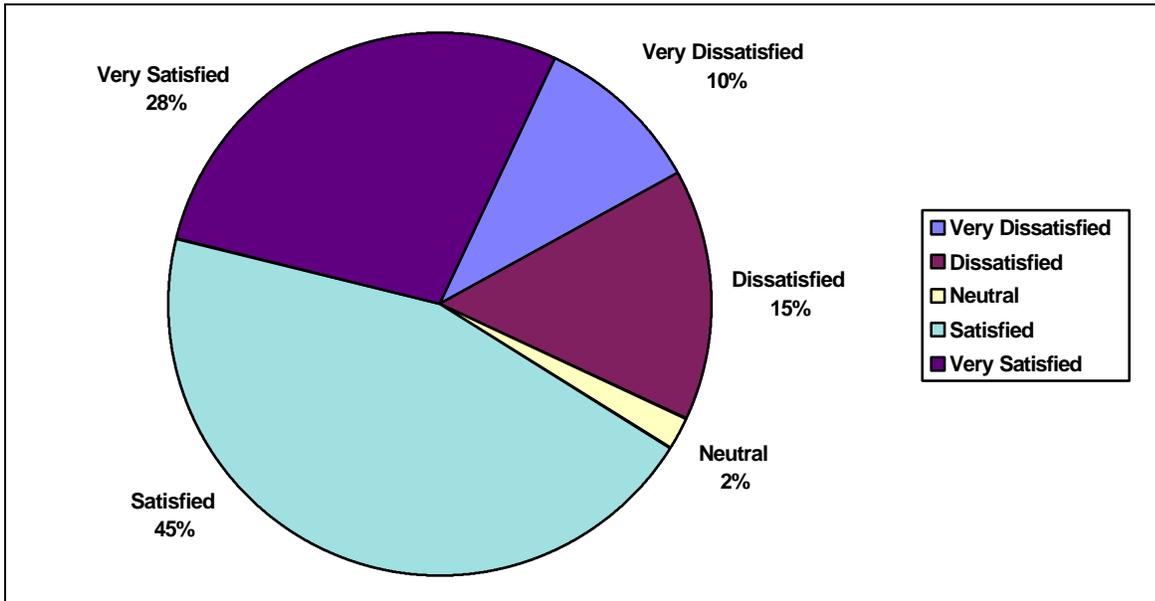


Figure 3. Example of percentages presented in a pie chart.

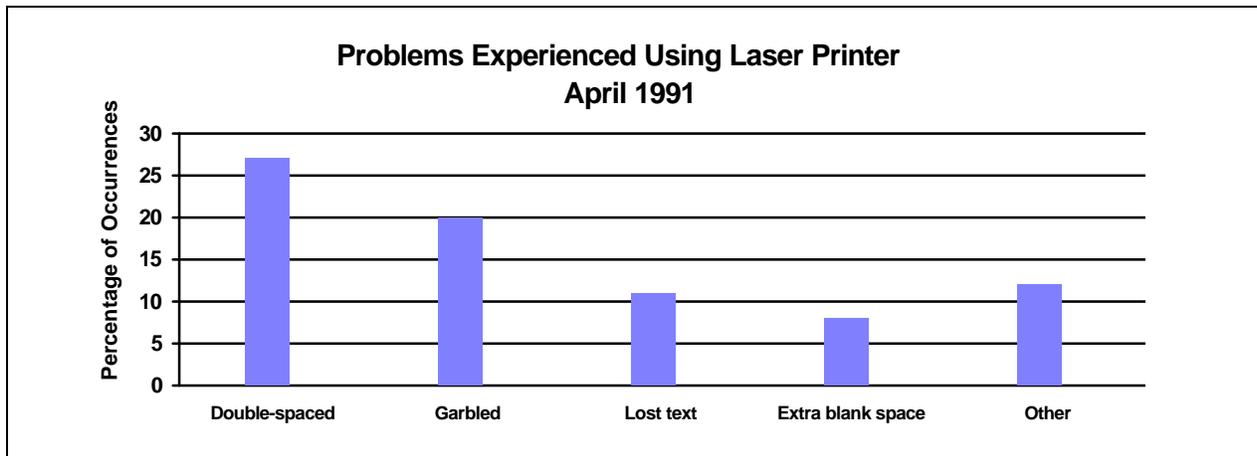


Figure 4. Example of ranked data presented in Pareto chart.

Pareto charts. Pareto charts are used to present ranked data. Pareto charts are particularly useful in helping to focus attention on major factors or issues. Pareto charts are bar graphs that present data in descending order of frequency or magnitude combined with a cumulative percentage line.

Unless a statistician or someone well-versed in survey development and statistical analysis is available, keep the analyses focused on frequency distributions, rank orderings, counts, and averages. More complicated statistical analyses, such as analysis of variance or regression analysis, should be conducted by people familiar with them.

Sampling

Since surveys can be expensive in terms of printing, mailing, and data entry costs, it is common to select a subset or small group of people from which to gather data. This subset or small group is known as a sample. The people targeted to fill out a survey are chosen from a specific population. A population consists of all members of an organization or group of people who possess the desired traits, knowledge, experience, or characteristics of interest to the survey project. A population may consist of, for example, all civilian and military employees of the Department of the Navy, all personnel within a command, all department heads, or the users of a product or service.

A rule of thumb for selecting the size of a sample is to randomly select 10 to 20% of the members from the population being investigated. Random sampling means that each member of the population has an equal chance of being surveyed. Random sampling improves the probability that the

information obtained through the survey will represent the responses the entire population would give. Please consult with someone who has statistical expertise when developing a sample, especially if you intend to use more advanced analytic methods to interpret the results.

The number of respondents could be quite large. One way to simplify the situation is to think of respondents in terms of segmentation. Segmentation means to sort respondents into groups based on similar characteristics, such as relationship to the organization (internal, end-user, supplier), rank, or the types of products or services used. Sorting respondents into groups is a commonly used method to identify and distinguish the experiences and perceptions of distinct groups. Demographic items are used in surveys to identify respondents so that their data can be sorted and analyzed as needed.

For instance, a DON organization could segment respondents by whether they are part of afloat or ashore commands, operational or support units, headquarters offices or field activities, or a combination of these work environments. External respondents could also be grouped by their use of the organization's product: those respondents who use a naval station's piers versus tenant commands that inhabit buildings on the naval station versus respondents who travel to the naval station to use the legal services, the library, and club facilities.

Communicating Survey Results and Determining Implications for Improvement

One of the most important actions after collecting and analyzing survey data is communicating the results. You might need to tailor presentations of results for different groups in the organization. First, report the results to managers in the organization, particularly those in areas highlighted by the data.

Presentations of results to those working in the processes should focus on specific product or service requirements. People working in the process have intimate knowledge of that process, and can offer ideas on how to improve it.

A summary of the survey results should be provided to respondents when possible along with a discussion of planned efforts to address identified problems and concerns. The surest way to kill respondents' interest in providing information is to do nothing with the information they provide.

Conclusion

Surveys can be used to provide information to support improvement efforts. Surveys can be used to obtain information on external customer requirements, current satisfaction levels, ideas on how to improve, and the effects of previous efforts. Based on this information, decisions can be made on where to focus the organization's future improvement efforts. Keep the following in mind when beginning an survey:

- ☑ Have a clear purpose for conducting a survey.
- ☑ Tailor your survey to the particular respondents and issues being assessed.
- ☑ Keep surveys short and simple.
- ☑ Communicate results to managers and respondents.
- ☑ Use results to guide future improvement efforts.

Resources on Surveys

The following sources provide more information on developing and interpreting surveys.

Brassard, M. (1989). *The memory jogger+*. Methuen, MA: GOAL/QPC.

Brassard, M., & Ritter, D. (1994). *The memory jogger II: A Pocket Guide of Tools for Continuous Improvement & Effective Planning* Methuen, MA: GOAL/QPC.

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Scholtes, P. (1988). *The team handbook* Madison, WI: Joiner Associates Inc.

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