

US EPA ARCHIVE DOCUMENT

## FACTSHEET VII

This Factsheet compares three alternative units of analysis that might be used for customer feedback activities at EPA and recommends that one of them, the person served, be used as the unit of analysis in most *surveys* of customer satisfaction conducted by EPA. It also recommends that another, different unit of analysis, the individual customer transaction, be used as the unit of analysis for most activities that rely on *continuous feedback* to track the level of customer satisfaction and how it is changing over time.

The *unit of analysis* selected for the collection of customer feedback information is important for a number of reasons: It affects the size of the list from which the sample needs to be drawn and therefore affects the decision as to sample size, it affects what kinds of things will be included on that list, it affects what is asked of each person contacted, and it affects how the responses of those in the sample (i.e., those contacted) are analyzed.

There are three principal alternative units of analysis that might be used for any given customer feedback activity at EPA:

- 1) The unit of analysis is the customer transaction. (This is explained in the discussion that follows below.)
- 2) The unit of analysis is the person served.
- 3) The unit of analysis is the organization served in each case where the person served was acting on behalf of an organization.

To clarify the differences among these three possible units of analysis, let's look at the implications of choosing one of these units of analysis as compared with each of the others.

To facilitate this comparison, let's assume that the customer feedback method that has been selected for use is a telephone survey. Once the unit of analysis to be used is selected, the next steps are to determine what sample size to use, then to randomly select that number of specific people (or organizations) to be called.

Keep in mind that any customer feedback activity should seek feedback from customers on their satisfaction with products and services received in *a certain specific period of time*. For clarity, we will here assume that the period of time of interest is a specific calendar year.

In examining all the customers served in a specific (hypothetical) EPA program area for the year of interest, we discover that a total of 236 different *people were served* (by being provided a product or service). On closer examination we discover that there were a total of 377 *customer transactions*. The reason for the difference in these two numbers is that some customers, after obtaining one product or service, called back later in the year to request another product or service. A few then called back a third time, and so on. We here refer to each

occasion on which a specific person called to obtain a single specific product or service as a customer transaction.

## COMPARISON OF PERSON SERVED VERSUS CUSTOMER TRANSACTION AS THE UNIT OF ANALYSIS

If the unit of analysis is the *person served*, then we will use 236 as the total number of people/things to be characterized and this will be the basis for choosing the sample size. If the unit of analysis is the *customer transaction*, then we will use 377 as the total number of people/things to be characterized and this will be the basis for choosing the sample size.

If we decide to use the *person served* (of which there are 236) as the unit of analysis, and we choose to use a sample size of 40, then we need to make a random selection of 40 persons served. So at this point we will put together a list of all 236 persons served. Note that each person served will appear on this list only once, no matter how many times he/she called during the year to obtain a product or service. As a consequence, when 40 names are randomly picked from this list, each person served has the same chance of being picked as every other person served, no matter how many times he/she called during the year to obtain a product or service. Finally, when the persons randomly selected are called, they will be asked about *all of their experiences during that year* as customers of that EPA program area.

If instead we decide to use the *customer transaction* (of which there are 377) as the unit of analysis, then all else being equal, we will need a larger sample size because we now have more things (transactions) to sample from. Let's say we now, as a consequence, choose to use a sample size of 70. To randomly select 70 of these 377 customer transactions, we will need to make a different, longer list of things to pick from. This time the list will contain 377 items, and each item in the list will be a customer's name *plus* the one product or service obtained in a single transaction. (Each item in the list may also include the date on which that product or service was obtained—this will be desirable in those program areas where we find some individuals obtaining the same product or service more than once during a single year.)

Customers who obtained more than one product or service during the year will appear on the list more than once, and those customers appearing on the list twice (because they obtained two products or services during the year) will have twice as great a chance of being randomly selected to be part of the sample as those customers who only obtained one product or service during the year. Furthermore, what will be picked is not just the name of a customer but the name of the customer *plus* the specific product or service he/she obtained in a specific transaction during the year (plus, if needed, the date it was obtained). Finally, when those picked are called, the questions they are asked will focus specifically on that one transaction, i.e., they will be asked to limit their response/comments to how satisfied they were with that one particular product or service (obtained on that date), how courteously they were treated when obtaining that one product or service (on that date), etc.

Because of the greater complexity associated with its use, it is expected that most EPA program areas will *not* use the customer transaction as the unit of analysis for their customer feedback surveys. At the same time, when there is reason to believe that the degree of customer satisfaction varies greatly from one product or service to another provided by the same EPA program, it may be decided that it is appropriate in that case to use the customer transaction as the unit of analysis. If so, it is important to remember, when contacting each customer included in the sample, to ask the customer to limit his/her comments to that one particular product or service obtained in the transaction for which he/she was selected even if he/she obtained two or more products or services during the year.

Note that useful product- and service-specific customer satisfaction data can also be obtained by using the person served as the unit of analysis. This can be accomplished as follows: Use the total number of persons served as the basis for choosing the sample size. Next, use the list of persons served as the basis for randomly selecting the specific persons to be contacted. Then, when calling each person selected, first, ask him/her to identify all of the various products or services he/she received during the year; second, ask about his/her overall satisfaction with those products and services; and finally, ask about his/her degree of satisfaction with *each individual* product and/or service received. The analysis of the results obtained can then be used to characterize the overall degree of satisfaction of the 236 customers as a whole, and will also provide useful information about differences in degree of satisfaction with specific products and services.

### COMPARISON OF PERSON SERVED VERSUS ORGANIZATION SERVED AS THE UNIT OF ANALYSIS

For this same example (236 persons served in 377 customer transactions), there is yet another possible unit of analysis: *the organization served* (rather than the person served) for customers that were acting on behalf of an organization. In this (hypothetical) case, of 236 persons served, 96 were acting on their own behalf, and 140 were acting on behalf of an organization. Furthermore, there were several cases where more than one person served was acting on behalf of the same organization. For example; seven different persons called to obtain products or services on behalf of the XYZ corporation, five different persons called to request products or services for the ABC law firm, and three different people called requesting products or services for the LMN environmental group. We find, on further examination, that the 140 persons served who were acting on behalf of a organization were acting on behalf of a total of 63 different organizations.

With these facts in mind, the EPA program area conducting the survey may decide that it wants to know how satisfied each of these *organizations* as a whole was with the products and services it obtained. In this case, depending on how it is decided to approach those *not* acting on behalf of an organization (i.e., persons acting as members of the general public), we could end up with a total of 159 total customers (persons and organizations)—the total of the number of organizations served (63) plus the total number of persons from the general public served (96).

Or we could instead treat the 96 members of the general public as one group and the 63 organizations served as a second group, and sample separately from each of these two groups. In that case, we would again have a total of 159 people or things to sample from (63 organizations in one group plus the 96 members of the general public treated as one group), but we would approach the sample selection process differently.

Let's say that the program area seeking customer feedback decides to use the second approach: We then have a total of 159 people and things to sample from, separated into two different groups. We will need to sample separately from the group consisting of the 63 organizations served and from the group consisting of the 96 members of the general public who were served.

Let's begin our discussion of how this sample selection process can be conducted with the group consisting of the 96 members of the general public. We want to select a sample of these 96 persons to contact in our survey. In this case, all else being equal, with only 96 persons to sample from, we can use a smaller sample size than we used earlier when the unit of analysis was people served (of which there were 236) or customer transactions (of which there were 377). Let's say it is decided to select a sample of 25 from this group. The most straightforward method for selecting these 25 would be to create a list of the 96 members of the general public and then randomly select 25 names from that list. We then contact each of these 25 people in our phone survey.

Let's now address the group consisting of the 63 organizations. We want to select from these 63 a sample to be contacted in our phone survey. Again, all else being equal, with only 63 things to sample from, we can once again use a smaller sample size than we used earlier when the unit of analysis was people served or customer transactions. Furthermore, we can also use a smaller sample size than we used for the group consisting of the 96 members of the general public. Let's say it is decided to use a sample size of 20. We now have to select 20 organizations to contact in our survey. Once again, the most straightforward method for selecting these 20 would be to create a list of the 63 organizations served and then randomly select 20 organizations from that list.

But we now have another problem. We need to decide who to call at each of these organizations. For those organizations where only one person called during the year to obtain a product or service on behalf of that organization, there is no problem—that is the person who will be called. But for organizations included in the sample for which more than one person obtained a product or service on behalf of that organization, a decision has to be made—will all of these persons be called during the phone survey? If not all, then how will those to be called be selected and how many will be selected for each organization?

As you can see, using the organization served as the unit of analysis results in a number of complexities. There are further complexities that arise in analyzing the results obtained from using such an approach. For this reason, those at EPA responsible for obtaining customer feedback should in general not use the organization served as the unit of analysis (unless of course they have a compelling reason to do so).

## CONCLUSION

We conclude that, in most cases, for reasons of simplicity and convenience alone, the preferred unit of analysis for obtaining customer feedback by means of *surveys* at EPA will be the person served. Experience with customer surveys elsewhere has shown that using the person served as the unit of analysis gives meaningful and very useful results. Since surveys based on person served are the easiest to design and carry out, EPA programs undertaking customer surveys are encouraged to use persons served as the unit of analysis for all of their customer feedback activities, except when there is a compelling reason to do otherwise. Furthermore, adopting person served as the unit of analysis for most customer feedback surveys at EPA will maximize the comparability across different program areas and over time of the results obtained from these surveys.

Please note that the above conclusion applies only to customer satisfaction *surveys* (periodic surveys). In any case where a *continuous feedback* approach is to be used (like a comment card included in each copy of a publication sent out or a followup phone call to each *n*th customer 2 days after a product or service has been provided), then the unit of analysis will instead normally be the specific customer transaction (the transaction in which the product or service was provided) about which the feedback is being sought.