



Data Gathering Methods and Instruments

Introduction

As discussed on the ICAO TNA website, there are different ways – or methods – available to gather data during a TNA. Each one has advantages and disadvantages so that there is no pure method that can “do it all”. Which to select and use depends on the context of the TNA, the kinds of decisions to make and existing conditions. For example, methods that take longer to prepare and use aren’t efficient when time is short.

The key guiding question to ask to select methods is therefore “How can I most effectively and efficiently get the data I need to make good decisions?”

The 5 most common methods for data gathering are,

- (a) Document reviews
- (b) Interviews
- (c) Focus groups
- (d) Surveys
- (e) Observation or testing.

While each has many possible variations, we will discuss their typical use here.

Basic Principles

Here are some basic principles to keep in mind when selecting methods.

1. Consider the characteristics of your target population. A target population is the group of people directly concerned by a TNA. For example, in an organization of 500 people, a TNA may only involve those 50 – the target population – who are directly affected by a problem.

To select methods for a TNA, review the level of education and employment categories of your target population:

- (a) The level of education affects the type of questions to ask during an interview or in a survey. Surveys, for example, require being able to read and write to answer. A target population with a lower level of education may not understand a survey and respond improperly. In order to be useful, the methods selected must be accessible to participants.
- (b) Employment category also affects how we communicate with the target population. Job level may influence the choice of methods (using interviews with senior managers and executives, for example) or the language used (different vocabularies for different professions).

Other conditions may exist that affect how people react during a TNA. For example, it is often better to interview (sometimes quite informally) disgruntled employees and “hear them out” than sending

a survey. Interviews help establish more personal rapport that shows attention and interest, and helps get to the bottom of things.

2. Use more than one method. Whenever possible, use more than one method to reach more participants and validate your data. This helps gain a broader or deeper understanding of the problem investigated and “triangulate” your data. Triangulation happens when different methods yield similar data. When a needs assessor gets similar answers from different methods, s/he can feel more confident that the data is complete and valid.

As a rule of thumb, use different methods to gather data until it becomes repetitive (the same or similar data is found) or predictable (it is highly likely that any new data will confirm what is already known). When this happens, you can feel confident of “having the data”.

3. Consider time, costs, and other constraints. Be real: methods that can’t be used are worthless. Ask yourself how long it will take to write, distribute recover and analyze a questionnaire, for example? Can it be done within the time available? Is it realistic to interview each member of a larger target population located at different work sites?

Be real and work with existing conditions, BUT... don’t give up too easily and conclude something won’t work before considering it. Beware of personal preferences for using methods. Look for options and be open to compromise before deciding about methods.

General Rules

The following general rules summarize Table 1 and provide quick reminders of things to consider when selecting methods.

1. ALWAYS look first for documents that may explain what’s happening. Documents sometimes exist that describe a problem well and provide valuable leads about solutions. Review them before deciding about other methods: what is found in documents can help decide what is missing and how best to get it.
2. Use interviews to interact with senior managers and executives.
3. Use interviews to create more personal rapport. This can be important when working under difficult conditions or when there is significant discord in an organization.
4. Use interviews or focus groups instead of surveys when the level of education is low.
5. Use interviews to reach a smaller number of participants, surveys for larger ones.
6. Use focus groups to extend interviews to groups and reach more participants.



7. User observation or testing when the expected performance is clearly defined in an existing standard. For example, use interviews to explore how change may affect a job, and observation to evaluate job performance.
8. Use Information Communication Technologies (ICT - computers and their networks) to reach a dispersed population. ICT allows distributing surveys to larger (or dispersed) groups, or interviewing participants at a distance. Be sure, however, that everything works well: computer problems (real or perceived) can seriously affect data gathering and the quality of the answers obtained.
9. Complement your data gathering using appropriate methods with informal discussions and observations. Good needs assessors pay close attention to what happens around them and use what they learn. In the end, short, informal conversations about problems at work may be more insightful than the best survey.
10. Avoid becoming fixated with using one method or another. Be flexible and adapt to existing conditions. Keep in mind that the best method is one that works!

Methods Definition

Table 1 describes the different methods that can be used to gather data during a TNA and offers hints on how to use them.

Table 1: Summary of Data Gathering Methods and their Use

Method	Advantages / Disadvantages	Comments
Surveys / questionnaires	<p><u>Advantages</u></p> <ul style="list-style-type: none"> (a) Can reach a large population. (b) Many possible variations in their design and use. (c) Can be completed anonymously. (d) Can be made easy to complete. (e) Can be used to gather quantitative and qualitative data. <p><u>Disadvantages</u></p> <ul style="list-style-type: none"> (a) Can be difficult and time consuming to develop. (b) Influenced by education (reading level) and culture. (c) Can become annoying when not focused or too long. (d) Requires follow up to get a good response rate. (e) Often can't check incomplete or problematic answers. (f) Often ignored when overused. 	<p>Surveys are often used to collect numerical data. For example, when respondents select numbers on a scale to answer questions. They can also include open questions that require writing an answer. Which to use depends on different conditions, like level of education. Respondents with a limited education may not be able to write longer answers.</p> <p>Interviews can be used to select questions for a survey. After conducting a few of interviews, typical answers or comments are identified and converted into questions for a survey.</p> <p>Example: during some interviews employees indicate that they don't have the tools they needed to perform well. This information could become the following survey question: "Select a number on a scale of 1 to 5 that best reflects how you feel about your work tools (1 = Not available; 5 = we have all that we need).</p>
Knowledge and skills testing	<p><u>Advantage</u></p> <ul style="list-style-type: none"> 1. Relatively easy to prepare when a good job task analysis is available. 2. Focused on job performance. 3. Can take advantage of available subject matter expertise. 4. Results are more easily quantifiable and comparable. <p><u>Disadvantages</u></p> <ul style="list-style-type: none"> 1. Tests are often intimidating or stressful, and can affect performance. 2. Good tests require more work to develop than often expected. 3. Essential knowledge and skills must be clearly reflected to be valid. 4. Can disrupt normal activities. 5. Tests measure the ability to perform, not the motivation to do so. 	<p>Observation or testing are appropriate when there is a clear best way to perform a job, that can be measured specifically (existing standard). For example, when a job requires following the same procedure or applying similar thinking. They can be difficult to use when jobs require adaptive behavior (adjusting performance depending on conditions).</p> <p>Tests must be checked and validated before they are used. This means trying them with some participants, making adjustments and then using them with all other participants.</p> <p>Tests must be short and specific, with only as many questions as needed to assess the whole performance. They must also reflect real job conditions.</p>

Method	Advantages / Disadvantages	Comments
Observation	<p><u>Advantages</u></p> <ol style="list-style-type: none"> 1. Allows investigating work under real conditions. 2. Can be discreet and conducted without disrupting work. 3. Allows seeing actual performance rather than what is reported. 4. Allows uncovering unexpected issues that must be addressed. 5. Takes interaction, collaboration or team work into account. <p><u>Disadvantages</u></p> <ol style="list-style-type: none"> 1. Time consuming with larger groups. 2. Influenced by the quality of observations and note taking. Observers must be trained and use good instruments to record what they observe. 3. The results of one observation cannot be generalized to other observations (individual performances). More observations are therefore needed to confirm how more employees perform. 4. Can be difficult to set up (e.g. permissions or scheduling). 5. Being observed can change how some perform so that what is observed does not reflect typical performance. 6. Some may refuse to be observed or be uncomfortable and resistant. 	<p>Observations are about visually confirming what's going on. They can be highly structured and use check lists, for example, to rate what is observed, confirm the procedure followed or tools used.</p> <p>Observations can also be open and rely on notes from experts familiar with the job and with doing observations. Good notes are essential: the quality of notetaking directly affects the quality of the data gathered.</p> <p>As a rule of thumb, use formal observation (with check lists, for example) to check job performance and less formal ones to investigate general behavior (to assess motivation, for example).</p>
Document review / critical incident analysis	<p>Document review</p> <p><u>Advantages</u></p> <ol style="list-style-type: none"> 1. Uses existing information. 2. Less influenced by changes or unforeseen circumstances. 3. Unobtrusive: no need to disrupt work underway. 4. Allows identifying job performance standards that can be applied locally. 5. Can provide leads to explore (people to interview, for example). 6. Can provide a historical perspective to better understand current events. 7. Considers both internal and external documents. <p><u>Disadvantages</u></p> <ol style="list-style-type: none"> 1. Available documents are not always good sources of information. Better documents may not be available (or shared). 	<p>This method involves finding and reviewing documents ranging from letters of complaint, industry reports, policy documents or more strategic ones, to better understand the problem.</p> <p>The critical incident report typically describes an important event that is a problem or that otherwise negatively affects the organization. For example, reports about accidents or emergencies.</p> <p>Unless documents can't be found or are clearly not useful, every TNA should identify and review relevant documents. Whenever possible, the information obtained from documents should be validated and any serious difference between what different sources report should be reconciled.</p>

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	<p>2. Can be time consuming to review all documents.</p> <p>Critical incident</p> <p><u>Advantages</u></p> <ol style="list-style-type: none"> 1. Can provide insight into the causes of problems. 2. Reports real events. <p><u>Disadvantages</u></p> <ol style="list-style-type: none"> 1. Must be well reported to be useful. Bad reports can be misleading. 2. Can be difficult to analyze and understand after the fact. 3. May require consulting experts to confirm findings. 	
Interviews	<p><u>Advantages</u></p> <ol style="list-style-type: none"> 1. Allows for face-to-face contact and observing behavior. 2. Allows exploring and clarifying opinions, or dealing with the unexpected. 3. Helps engage participants in the TNA process. 4. Helps explore / confirm other data / information (for example, the information obtained from documents). <p><u>Disadvantages</u></p> <ol style="list-style-type: none"> 1. Can be time consuming and depend on the availability of individuals. 2. Individuals can't always identify or express true needs. 3. Some may use this opportunity to vent frustrations or discuss other issues. 4. Interviewers must be skilled and well prepared. 5. Interviewing many can be time consuming and expensive. 6. Requires careful sampling when dealing with a large population. 7. Interviewers sometimes 'take over' and negatively affect the interview. 	<p>Interviews are one-on-one conversations to explore ideas, opinions, values or other points of view. Some interviews can be quite structured, use specific questions and record answers in non-equivocal terms (like yes/no). Other interviews are more open and allow exploring issues as they arise. Regardless of the approach used, it is essential to take good notes that truly reflect the interview.</p> <p>Interviews are particularly useful to,</p> <ul style="list-style-type: none"> • Investigate issues in depth. • Explore ideas, opinions and attitudes. • Explore sensitive topics that some may not want to discuss in public. <p>Interviews alone are not always effective to explore issues that affect larger groups. Samples can be used instead if they represent the population well. For example, interviewing 5 employees that represent well the characteristics of a larger group of 20 may be enough to identify important issues.</p>
Focus groups	<p><u>Advantages.</u></p> <ol style="list-style-type: none"> 1. Allow interviewing more individuals within a limited amount of time. 2. Allows participants to discuss important issues with their peers. 3. Helps with team building by shifting the focus from the individual to the group. 4. Allow comparing and sifting through ideas towards consensus. 	<p>Focus groups are essentially group interviews. They are structured and led differently than interviews, but yield similar data. Focus groups are particularly useful to,</p> <ol style="list-style-type: none"> (a) Engage a group in generating, discussing and refining ideas. (b) Confirming group opinions, values and tendencies.



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	<p><u>Disadvantages</u></p> <ol style="list-style-type: none">1. Time consuming and subject to the availability of individuals.2. Can lead to conflict (if not well facilitated) or affected by existing conflicts between individuals or groups.3. Not everyone wants to discuss issues with others (or share information).4. Requires a skilled group leader to manage group dynamics and achieve good results.	<p>(c) Explore topics more deeply than can be done during individual interviews.</p> <p>(d) Creating ownership of problems and solutions.</p> <p>(e) Reach more participants than possible with interviews alone.</p>