

# UNIT 4 - DATA COLLECTION AND ANALYSIS

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## Getting started

We are continuing the process that we briefly suspended at the end of Unit 2. At that point we had used the framework to source information that we would draw on to create data collection instruments. While it may appear that it took us a long time to complete that task, one should not underestimate the value of the preparatory work required to ensure that the most appropriate data are collected to do a thorough investigation of the problem.

At this point of the project, we are setting the stage to return to the real world, otherwise referred to as the field. Then having completed that fieldwork, we step back into our spaces of formal study to complete the project. In reality, there are several dimensions to the work to be carried out in this final phase. They are,

- Preparing the data collection instruments
- Pilot-testing the instruments
- Deciding on and selecting people from whom the data would be collected, i.e. the participants (respondents)
- Collecting the data
- Cleaning-up and organising the data.
- Analysing the data
- Drawing conclusions and making recommendations
- Writing the project report
- Doing an oral presentation of the report (if required).

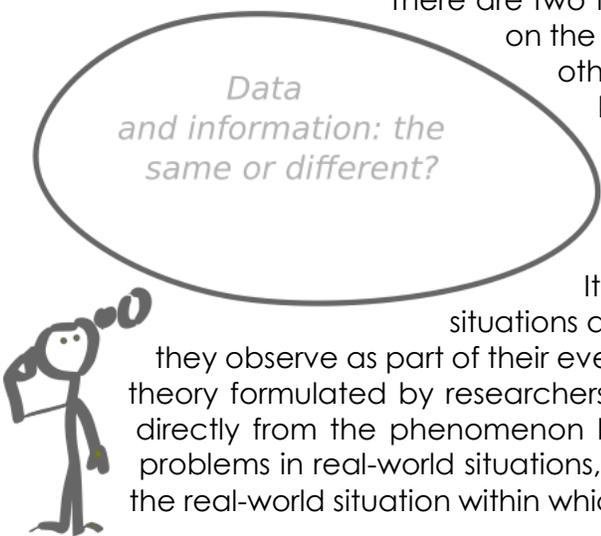
It is beyond the scope of this course to cover all these aspects of the project activity. Nonetheless, we are of the view that those that we have addressed, both in the previous units and this one, can provide the necessary support for you to carry out those tasks not directly dealt with here.

In this Unit we turn attention to two commonly used methods for collecting data for the project, namely the survey and the interview. By extension, we also examine the instruments actually used in each of these methods, namely the questionnaire and the interview schedule. We then address the procedures for analysing the data. It should be noted though that we cover data analysis at a basic level only, with the intention that it would provide a useful foundation for more advanced analysis if and/or when required in the future.

## Learning Objectives

- ❖ *Establish the importance of 'data' in this phase of project work.*
- ❖ *Recognise the survey and the interview as two main data collection methods for undertaking project work.*
- ❖ *Identify and describe the core attributes that define these methods.*
- ❖ *Make the link between the questionnaire and the supporting information previously sourced.*
- ❖ *Explain how the questionnaire works and specify its constituent parts.*
- ❖ *Demonstrate an awareness of how individual items are created in the questionnaire.*
- ❖ *Distinguish among different types of items in the questionnaire.*
- ❖ *Construct a questionnaire.*
- ❖ *Use established criteria to assess the quality of the questionnaire.*
- ❖ *Distinguish among three types of interviews.*
- ❖ *Describe the steps required in preparing to conduct an interview.*
- ❖ *Demonstrate knowledge of established standards governing the conduct of the interview.*
- ❖ *Distinguish among the different angles for viewing survey data to be analysed.*
- ❖ *Organise survey data as a forerunner to conducting the analysis.*
- ❖ *Select and use appropriate means for summarising and presenting survey data, depending on type and measurement levels.*
- ❖ *Demonstrate an awareness of strategies for conducting the analysis of interview and other forms of qualitative data.*
- ❖ *Use a structured approach to writing the project report.*

## 4.1 Collecting the data



*Data  
and information: the  
same or different?*

There are two terms that we should get used to as we embark on the exercise of data collection. One is *data* and the other is *empirical*. While data and information are broadly similar in meaning, the term 'data' applies specifically when the information is collected to be organised and analysed for a specific purpose.

It is empirical data when it is gathered from the situations and events that people experience or from what they observe as part of their everyday living. The data collected is not based on theory formulated by researchers or other theorists. It is obtained first-hand and directly from the phenomenon being studied. Thus, since we are dealing with problems in real-world situations, empirical data is what we collect directly from the real-world situation within which the problem is embodied.

Two other terms used to describe data are *quantitative* and *qualitative*. Quantitative data is numerical, in that it uses numbers to represent the elements or *variables* being measured in the course of the project. These numbers can be computed and manipulated mathematically. Qualitative data is not numerical in that it does not entail calculations; its focus is on providing descriptions of what is experienced or observed, using spoken and/or written language. We will expand on this later in the Unit. However, it is important to keep both in mind from the outset as they define the two data collection methods we will be focussing on, namely the survey and the interview.

## 4.2 The survey

A survey entails the use of a questionnaire that may be administered in either of two ways. It may be self-administered, with the respondent required to complete the questionnaire on paper or using an online tool. Alternatively, it may be administered by an interviewer who poses the questions to the respondent (interviewee) and records the responses on the questionnaire. This latter approach may be done either face-to-face, by telephone or online.

### 4.2.1 Developing the questionnaire

The questionnaire is the main instrument (or tool) used to collect data in a survey. All the questions (or items) included in the questionnaire are guided by the project objective. However, in a more specific way, they are developed out of the details that emerge when the sub-topics of the framework are used to identify supporting information in the sources that you have selected. It is those details that are going to provide you with the content for creating the individual items relative to the respective sub-topics.

The items are of two types: closed (or close-ended) and open-ended. Closed questions require respondents to select among options in order to provide a response. Open-ended questions, on the other hand, give respondents the freedom to decide how to respond. There are pros and cons to both types, however in a typical questionnaire, most questions are of the closed type, with only a few open-ended ones included.

Typically, the questionnaire is sub-divided into sections, with each section containing questions on a single sub-topic. The sections must also be sequenced in a logical order. The task now is to make the transition from the details you have gathered relative to a sub-topic to actual questions (items).

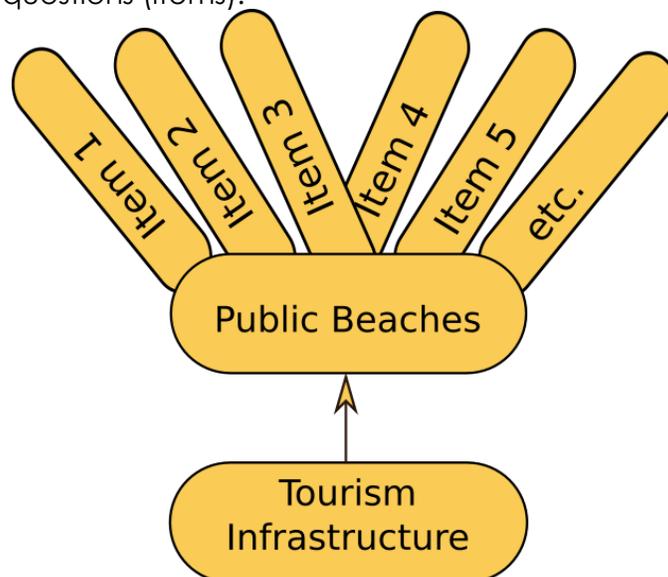


Figure 4.1 – From sub-topic to questionnaire items

Here are some questions you may wish to ask yourself as you decide on the items for the questionnaire:

- Did your reading confirm what you already know about the sub-topics?
- What additional details did you get from your reading about a particular sub-topic?
- What specific real-world acts, situations, experiences do you see in your mind's eye when you think about that sub-topic?
- Do you find that you are also drawing on your own experience and prior knowledge when you are creating the items in relation to a sub-topic?

#### 4.2.2 Shortened version of a questionnaire

Let us return to the project objective to investigate factors responsible for the decline in visitor arrivals in Destination/Country X. We are going to develop three segments of a possible questionnaire. In developing this instrument, we are assuming that it is being developed for distribution by a travel agency that regularly organises tours to various locations and by extension regularly seeks feedback from its clients on completion of the tour.

In this instance the agency is going beyond the normal feedback data since it has noticed a decrease in persons signing up for the Country X tour. In addition, the Ministry of Tourism of the country has also noted a decline across the board from several markets. The Ministry and the travel agency have therefore decided to collaborate to administer this special survey.

You will no doubt notice that even though the impetus for this special investigation is the decline in visitor arrivals, there is no mention of that in the questionnaire. Not revealing the exact reason for the investigation is a deliberate decision aimed at avoiding a situation where it may influence how respondents approach the exercise.

Please note that this is **not** a complete questionnaire. Rather it is an abbreviated version developed primarily to illustrate specific question types, as well as to demonstrate how relevant supporting information may be used in the creation of the items. However, even though it is not a full questionnaire, I need to set these questions in some context. Thus, I must give the questionnaire a title and I must write a brief introduction to let the respondents know why I would like them to complete it.

**Title: Visitor evaluation of the tourist destination, Country X.**

**Introduction:**

My name is Jane Doe and I am the Communications and Research Officer of Travel Agency P. My organisation was pleased to have organised your recent trip to Country X and we trust that you are now safely back at home. Before you return to your daily routine, we would really appreciate if you can devote some time to give us your assessment about your experiences on the trip. Your feedback will greatly assist us in improving future tours to that destination. This exercise will take no more than 30 minutes. Please be assured that your responses will be confidential. We will appreciate if you can return the completed questionnaire within two weeks.

Thanks in advance for your kind cooperation.

Communications and Research Officer  
Travel Agency P.

**Section 1**

Following is a list of the normal services provided for both residents and visitors of any country. On a scale of 1 – 5, with '1' being very dissatisfied and '5' being very satisfied, indicate your level of satisfaction with each of them by shading the relevant number. If a particular service does not apply to you, please circle **NA** (not applicable).

- |   |   |
|---|---|
| 1) Immigration services at the airport          | <input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/> 5 <b>NA</b> |
| 2) Custom Services at the airport               | <input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/> 5 <b>NA</b> |
| 3) Airline check-in service                     | <input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/> 5 <b>NA</b> |
| 4) Transportation between airport and hotel     | <input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/> 5 <b>NA</b> |
| 5) Public transportation                        | <input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/> 5 <b>NA</b> |
| 6) Hotel Reception services                     | <input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/> 5 <b>NA</b> |
| 7) Customer service at banks                    | <input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/> 5 <b>NA</b> |
| 8) Customer service at restaurants              | <input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/> 5 <b>NA</b> |
| 9) Willingness of residents to offer assistance | <input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/> 5 <b>NA</b> |
| 10) Emergency health services                   | <input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/> 5 <b>NA</b> |

**Section 2**

Using the scale provided, indicate the extent to which you agree or disagree with the following statements about the public beaches in Country X.

**1** Strongly disagree **2** Disagree **3** Neither agree nor disagree **4** Agree **5** Strongly Agree

- |   |   |
|---|---|
| 1) The beaches in Country X are more scenic than those in neighbouring countries.               | <input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/> 5 |
| 2) The beaches in Country X are more suitable for bathing than those in neighbouring countries. | <input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/> 5 |
| 3) There are easily accessible shower and toilet facilities along the beaches.                  | <input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/> 5 |
| 4) There is an efficient garbage collection system on all beaches.                              | <input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/> 5 |
| 5) There is an uninterrupted supply of pipe-borne water.  | <input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/> 5 |
| 6) There are signs indicating areas that are safe for bathing.                                  | <input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/> 5 |
| 7) Lifeguards are not always visible.   | <input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/> 5 |
| 8) Vendors hardly intrude on the privacy of bathers.  | <input type="radio"/> 1 <input type="radio"/> 2 <input type="radio"/> 3 <input type="radio"/> 4 <input type="radio"/> 5 |

**Final Section**

Please indicate your gender.

- Male  
 Female

In which age bracket are you?

- 20 and under  
 21 – 30  
 31 – 40  
 41 – 50  
 51 – 60  
 Over 60

Are you employed?

- Yes  
 No

Was this your first visit to Country X?

- Yes  
 No

How many times a year do you go on vacation?

- Once  
 Twice  
 Three times  
 More than 3 times

Which one of the following terms best describes you as a tourist?

- Back-pack traveller  
 Adventure traveller  
 Senior tourist  
 High-end tourist  
 Middle-income tourist

Please use the space provided below to make any further comments about your visit to Country X.

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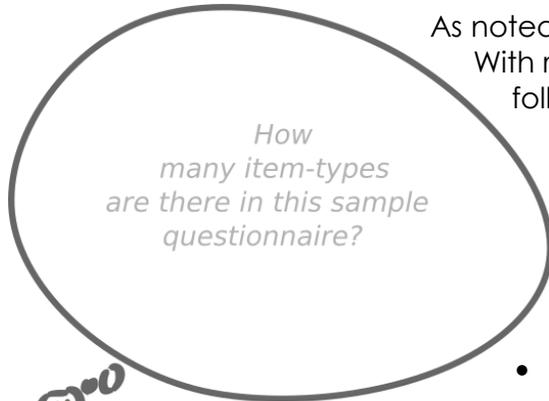
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### 4.2.3 Further points to note about the sample questionnaire

#### 4.2.3.1 Title and Introduction



As noted earlier, there is a title and a brief introduction. With regard to the latter, it typically contains the following:

- Brief statement identifying yourself.
- Purpose of questionnaire
- Brief statement assuring that responses will be treated confidentially.
- Participation – voluntary
- Time and method for returning questionnaire

#### 4.2.3.2 Question-types

As also noted earlier, questionnaires comprise two broad question (or item)–types: closed and open-ended. In our sample, all but the last are closed items. Within the closed category, there are several sub-types. Following are the types included in the instrument above:

- Dichotomous questions (Yes/No; male/female).
- Likert rating-scale questions (Strongly agree – Strongly disagree)
- Semantic differential scale (On a scale of 1 – 5, how satisfied are you?)
- Multiple choice questions (Which term best describes you as a tourist?)
- Category questions (In which age bracket are you?)

There are two types of rating scales in the sample. The Likert scale seeks to find out the extent to which respondents agree with pre-defined statements. The response given to this type of question is seen as a combination of feelings and thought on the part of the respondent, with a greater bias towards how he/she thinks. It is assumed that when people say they agree or do not agree with a statement of any kind, they are using their mental faculties to come to that position. It should be noted that some researchers are not in favour of the midpoint of the Likert scale on the grounds that respondents may use it to avoid taking a definite position. Thus, some opt for a 4-point scale, while others may choose to use 'don't know' in that slot. In the final analysis, you are the one to make the decision, based on the requirements of your project.

The Semantic Differential Scale taps into the emotions of the respondent, seeking to measure attitudes, feelings or reactions to an object, situation, experience or any other entity on a scale ranging from a lowest to a highest point. In addition to satisfaction, this scale may also be used to solicit other reactions such as 'how likely/unlikely' 'love/hate'. For example,

On a scale of 1 – 7, with '1' being very unlikely and '7' being very likely, indicate how likely you are to recommend Country X as a tourist destination to a friend.

#### 4.2.3.3 *Dos and don'ts about writing the questions*

The following guidelines were adapted from Warwick, D.P. & Lininger, C.A. (1975). *The Sample Survey: Theory and Practice*. New York: McGraw-Hill Book Company, Chapter 6: Questionnaire Design.

- The words must be simple, direct and familiar to all respondents. Technical jargon, slang and 'folksy' expressions should be avoided.
- The question must be as clear and specific as possible. Questions must not be too general, too complex or otherwise ambiguous.
- Avoid double-barrelled items. A single item must not cover two or more issues.
- Avoid leading questions that push the respondent in the direction of a certain answer.
- Avoid loaded questions that contain emotionally charged words that introduce bias into the question.

The following resource materials provide useful additional information on the topic of questionnaire design. You may find the journal article a bit advanced but there are parts of it that are accessible and which you should find very beneficial.

#### **Resource Material 4.1**

Gibbs, Graham, R. *Questionnaire design, Part 2 of 3 – questionnaire layout and question wording*. Youtube video presentation published on November 23, 2012.  
Rowley, Jenny (2014). Designing and using research questionnaires. *Management Research Review*, 37(3), 308-330.

### Self-assessment exercise 4.1

For this SAE, you will construct your own shortened questionnaire. It should comprise the following:

- A title
- A brief introduction
- Two or three main sections made up of closed items
- A final section seeking personal information about the respondent.
- One open-ended question

To start the process, you will need to review the work that you have already done for SAE 2.1, SAE 2.2 and SAE 2.3. Also pay attention to Figure 4.1 earlier in this Unit as it outlines an approach for moving from sub-topic to questionnaire items. You have already identified a problem idea and developed the problem statement and project objective. You have also built a framework and used it for sourcing information. This is the stepping-stone for developing the questionnaire.

## 4.3 The interview

SOMETHING TO THINK ABOUT



*Should an interview be treated like a casual conversation. If yes, why? If no, why not?*

We are treating the interview as a separate data collection method even though we included it as a tool for administering the questionnaire in a survey. The interview may be of either of three types – structured, semi-structured or unstructured. It is the structured type that applies when an interviewer is administering the questionnaire, posing questions to the interviewee (respondent) in more or less the exact way that they are written. In this scenario, it is the questionnaire that carries the main responsibility for data collection and the interview is the means used for communicating the contents of the questionnaire to the respondent and receiving the required responses.

The other two types are the primary instruments for collecting data for the project. For the semi-structured type, the interviewer develops an interview schedule, which is less rigorous than the questionnaire and comprises a series of questions in keeping with the overall purpose of the interview. At this preparatory stage, the interviewer sometimes includes subsidiary questions to each of the main questions. With or without these previously prepared sub-questions, the interviewer will also insert follow-up questions as the need arises during the interview as a means of extracting further details that could

broaden and enhance the quality of the information provided on a main question. This is the skill of probing that we will discuss later.

The interviewer may or may not share the main questions with the interviewee. However, even if that is done, the insertion of impromptu follow-up questions ensures that the exchange does not fall into a static question-answer format and that a lively exchange is maintained. Part 1 of the video-taped interview on breastfeeding problems (see Unit 3) utilised the semi-structured format.

In the case of the unstructured interview, there are no prepared questions. Both the interviewer and the interviewee know what the topic is beforehand. However, while the interviewer will very likely have a plan for conducting the interview, there are not necessarily any pre-determined questions. The course that the interview takes is more or less determined as it proceeds. It is evident that the unstructured interview will require a high level of expertise on the part of the interviewer to ensure that it does not go off track and drift away from its intended goal.

The following two subsections, extracted from Warwick and Lininger (1975), provide further guidelines about the interview. You will note that these guidelines were developed for a structured interview that is linked to a questionnaire. It is nonetheless strongly recommended that you pay attention to them even if all may not totally fit the other two types. The first deals with how the interviewer asks the questions and the second explains the skill of probing, that is digging deeper to get a more satisfactory response.

### 4.3.1 Asking the questions

The interviewer has two major responsibilities in asking questions: developing and maintaining rapport with the respondent, and following standard procedures in using the research instrument. Since both are essential, one should not be emphasized to the exclusion of the other. The purposes of the study will not be served if the interviewer changes or omits questions in an effort to improve his relationships with the respondent. By the same token, little is gained if the questions are asked in such a rigid and mechanical fashion that the respondent becomes emotionally detached from the interview. We would offer the following guidelines for achieving both rapport and standardization.

1. *Use the questionnaire carefully, but informally.* The interviewer should treat the questionnaire as a tool for data collection, rather than a master controlling all his actions in the interview. ...
2. *Know the specific purpose of each question.* Both to satisfy the purpose of the research and to increase his own ease in using the questionnaire, the interviewer should be clear about what is considered an adequate response for each item. ...
3. *Ask the questions exactly as they are written.* Experiments on question-wording indicate that even minor changes in wording can alter the meaning of a question ...  
*Follow the order indicated in the questionnaire.* ...
4. *Ask every question.* Sometimes in answering one question, the respondent will make comments which seem to answer a later question as well. ... It may help, ... to say: "You may have answered this question before, but I want to be sure to put down your own answer ..."
5. *Do not suggest answers.* It is often tempting to suggest a response which seems to fit the respondent, especially after he greets a lucid restatement of the question with a blank stare. ...
6. *Provide transitions when needed.* A major challenge for the interviewer is to ensure that the questioning process flows smoothly from one item and one section of the questionnaire to the next. ...

(Warwick & Lininger, 1975, pp. 210-213).

### 4.3.2 Obtaining an adequate response: probing

Often during the course of the interview, the respondent will give answers which are incomplete, unclear, irrelevant, or otherwise inadequate to the purposes of the study. These situations provide the interviewer with one of the most critical tests of his skills – the ability to probe for answers. The term *probing* refers to a variety of techniques used to stimulate discussion and focus the flow of the discussion without suggesting answers. The specific aim of the probe is to obtain information which satisfies the purposes of the question. To carry out this task successfully, the interviewer must be thoroughly familiar with the objectives of each question. Without such knowledge, he will have no yardstick for gauging the adequacy of the responses. Several kinds of neutral probes may be used in the ... interview.

1. *The silent probe.* A well-timed pause is perhaps the simplest and most neutral way of stimulating further discussion by the respondent. ...
2. *Overt encouragement.* This form of probing draws on brief assertions of understanding and interest indicating that the interviewer accepts what has been said up to that point and would like to hear more. ... These include remarks such as "uh-huh", "I see", "hmmmm" ... as well as nonverbal expressions such as a nod of the head. ...
3. *Elaboration.* This consists of neutral questions or comments used to obtain more complete or accurate responses. ... The *Interviewer's Manual* suggests the following helpful phrases ...
  - a. "How do you mean?"
  - b. "Could you tell me more about your thinking on that?" ...
  - c. "Why do you think that is so?" ...
  - d. "What do you think causes that?" ...
  - e. "Anything else?"
4. *Clarification.* Here the interviewer not only asks for more information, but specifies the kind needed ....
  - a. "I'm sorry, but I'm not clear about what you mean by that – could you tell me a little more?" ...
  - b. "About when did that happen?" ...
5. *Repetition.* Sometimes the interviewer can probe by repeating what the respondent has just said as he records this information in the questionnaire. Respondents will often treat such "echo probes" as a request for additional information and will respond accordingly. ...

Probing is helpful only when it is *neutral*. ... The greatest danger of all lies in questions which implicitly suggest an answer or direct the respondent's attention to one alternative rather than others. ... (Warwick and Lininger, 1975, pp. 213-215).

**Resource material 4.2**

Problem-solving Part 1: video-taped interview on breastfeeding problems, with author of *A Practical Handbook for Breastfeeding Moms*.

**Self-assessment exercise 4.2**

*For this SAE we return to Part 1 of the video-taped interview on breastfeeding. Listen to the interview again, identify any examples of probing and indicate whether any of them fit the description of a probe as outlined by Warwick and Lininger, 1975.*

## 4.4 From data collection to data analysis

We have focussed on the questionnaire and the interview as these are the most common tools for collecting data in the investigation of the problem. We have designed and developed a questionnaire to be administered to a select group of people. We have also discussed the interview schedule that is used to guide the conduct of the interview. Once the data has been collected and adequately organised, it is time to move on to the analysis.

## 4.5 Analysing survey data

Data in its raw form is of little use. You are not going to be able to gain any understanding of the problem until you analyse the data that you have collected. When you analyse data, you are conducting a systematic examination of it in order to extract meanings that could provide insight into the problem you set out to investigate.

As noted earlier, we are not going beyond the more basic forms of analysis. However, the same principles apply even when you proceed to more complex forms. But before we get into the analysis, we will need to know what type of data we are dealing with since type will determine the method used for the analysis. Earlier we identified the different types of questions for developing the questionnaire. Now we need to take a similar approach with regard to the data.

### 4.5.1 Types of data; levels of measurement

The two video presentations that follow explain this issue. You will note that while the aim of both is to identify and describe data, the first is more basic than the second. Ensure that you have a good understanding of the two video presentations of Resource Material 4.3. The second goes into more detail, some of which is not necessary for this course. However, you should pay special attention to the description of data as being of either of two types, namely qualitative or quantitative in the second. At the end, you should be able to distinguish between these two types of data and you should also be able to

classify data according to levels of measurement, namely nominal, ordinal, interval and ratio (see also Table 4.2).

### Resource material 4.3

Brief Tutorial Statistics. *Levels of measurement*. Youtube video presentation published on November 2, 2015.

Jackson, Jack L. *Descriptive statistics: types of data*. Youtube video presentation published on July 21, 2016.

The following table summarises the characteristics of the different types of data.

Measurement Properties	Types of data			
	Nominal	Ordinal	Interval	Ratio
Can be grouped in different categories	✓	✓	✓	✓
Categories can be ranked		✓	✓	✓
Order of data values is meaningful		✓	✓	✓
Differences between data values are known and can be stated			✓	✓
Zero on the measurement scale represents total absence, showing where measurement begins				✓

**Table 4.1 - Measurement properties of types of data**

(Taken from Brown and Saunders, 2008, p. 14)

#### 4.5.1.1 Numbers as qualitative data

There is one additional detail to be noted about qualitative data. Earlier in this Unit, we said that the main difference between the two types was that quantitative data dealt with numbers while qualitative data did not, that it comprised of words. That explanation is correct to a significant extent. The data that you collect from interviews and from open-ended questions is recorded using language in the form of words and sentences, not numbers. Further, when it is subsequently coded for analysis, the codes are in the form of words, not numbers.

However, there are times when a number is used to represent data that is qualitative. In such cases the number does not have numerical value; it is not countable; you cannot add, subtract, multiply or divide it. Rather, it serves as a label to identify some entity. Thus,

'1' in a questionnaire can serve as a label for the category 'male' and '2' as the label for the category 'female'. Nominal data is qualitative. Ordinal data is also qualitative. In everyday life, we talk about a 3-star, 4-star or 5-star hotel in that order, with the 3-star being the lowest and the 5-star, the highest. Similarly, a respondent may be asked to indicate their level of satisfaction on a scale of 1 – 4, as follows:

1. Very dissatisfied
2. Dissatisfied
3. Satisfied
4. Very satisfied

These numbers represent an order, with one being the lowest and 4 the highest, however it is not possible to quantify the distance between two of them since ordinal data is not 'countable'.

Knowing the type of data you have collected is important when you have to decide how you are going to measure it.

### 4.5.2 Organising the data

Let's imagine that we have collected some data based on the partial questionnaire above regarding visitors' evaluation of Country X as a tourist destination. Let us look at the responses provided to Items 1 and 2 of the final section as well as those provided for all eight items in Section 2. We have reproduced some imaginary data from two of the completed questionnaires. In order to summarise the data from this segment of the questionnaire, all responses must be coded. Section 2 was pre-coded, 1 - 5 on a rating scale ranging from strongly disagree to strongly agree. Items 1 and 2 of the final section were not pre-coded. We must do that now before proceeding. Thus, male gets the code '1' and female, the code '2'. The codes for the variable 'age bracket', also created after data collection, are as follows:

20 and under	1
21 – 30	2
31 – 40	3
41 – 50	4
51 – 60	5
Over 60	6

Assessment of public beaches										
Variables										
Visitor	Sex	Age Bracket	Item 1	Item 2	Item 3	Item 4	Item 5	Item 6	Item 7	Item 8
1	2	4	3	4	2	3	4	5	2	4
2	1	5	4	2	2	2	3	4	3	2

**Table 4.2 - Collected data organised by 3 variables for each of two visitors/respondents**

Note that there are only two respondents in this table. The data for the variable Sex is nominal – there are two categories. The first visitor is female and the second male. For the variable Age Bracket, the data is ordinal. In both cases, the numbers cannot be counted, therefore the data is qualitative. With regard to the Age Bracket, note that what we have are categories, listed in an ascending order, hence it is ordinal data. Had the respondents been required to enter their individual ages, that would have been ratio data. The Section 2 responses are all ordinal data and therefore are also qualitative.

### 4.5.3 Summarising and presenting the data

You have a choice of three ways for summarising and presenting the data – through written descriptions, in tables or through graphical representations. In fact, when compiling the project report, you are very likely going to be using all three at different parts of the report. The two measures used for presenting nominal and ordinal data are frequencies, that is a count of the number of times a particular event occurs, and

percentages. The data presented in Table 4.3 is summarised using these two types of statistics. It was extracted from Brown and Saunders, 2008.

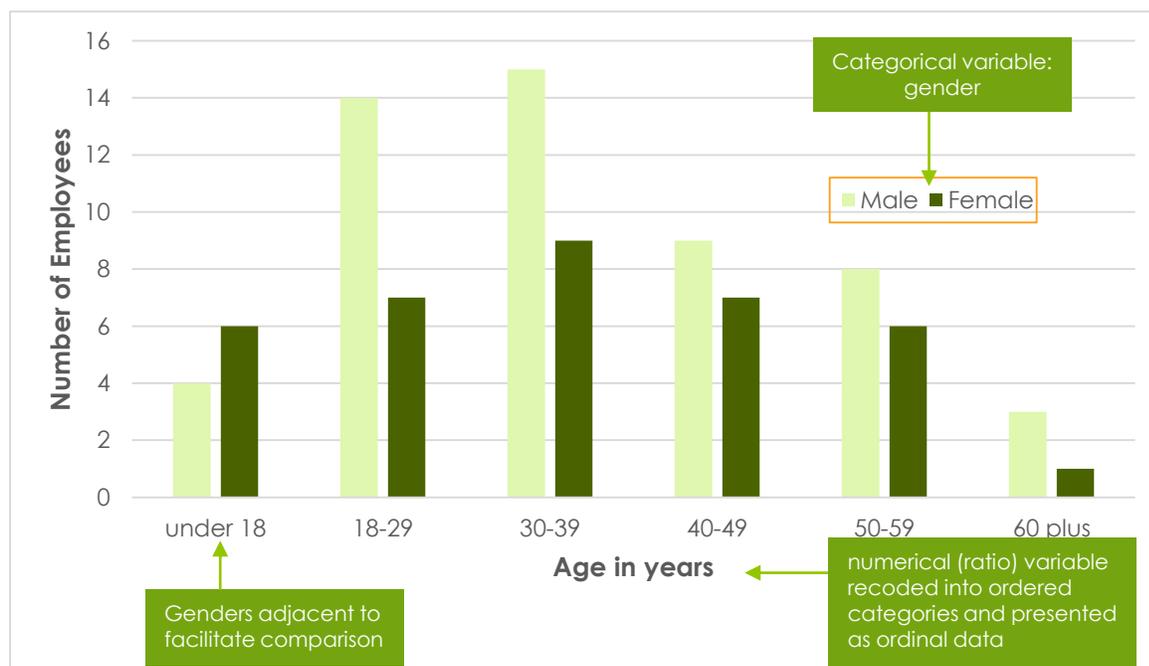
Age	Males		Females		All Employees	
	Number	Percent	Number	Percent	Number	Percent
Under 18	4	7.4%	6	15.8%	10	10.9%
18-29	14	25.9%	7	18.4%	21	22.8%
30-39	15	27.8%	9	23.7%	24	26.1%

**Table 4.3 - Table showing sales department employees by age and gender**

*(Taken from Brown and Saunders, 2008, p. 19)*

The explanations included will not normally be found in a table but they have been included here to aid in your understanding of the presentation.

For graphical presentations, pie charts or column charts are appropriate for nominal data and column or bar charts for ordinal data. Figure 4.2 depicts a bar chart based on the same data presented in Table 4.3



**Figure 4.2 - Bar chart showing sales department employees by age and gender**  
(Taken from Brown and Saunders, 2008, p. 20)

This final video presentation reinforces much of what we have already reviewed in terms of types and categories of data as well as levels of measurement. Pay special attention though to the latter part of the presentation that deals with the different methods of presenting data.

#### Resource material 4.4

Dr. Nic's Maths and Stats. *Types of data: Nominal, Ordinal, Interval/Ratio – Statistics Help*. Youtube video presentation published on December 12, 2011.

## 4.6 Analysing interview data

As indicated earlier, we are making a distinction between the survey method and the interview method even though the latter is sometimes used in the former for administering the questionnaire. The interview also falls more directly under the heading qualitative data. As a separate method, our focus is on the semi-structured interview for which one typically prepares an interview schedule.

You should find the following publication useful as a guide for undertaking all forms of qualitative data analysis, including interview data.

### **Resource material 4.5**

O'Connor, H & Gibson, N. (2003). A step by step guide to qualitative data analysis (2003). *Pimatiziwin: A journal of Aboriginal and Indigenous Community Health*, 1(1), 64-90.

## 4.7 Writing the project report

The final stage of implementing the project, is to write up the report. Following is a simple format that you may find useful for carrying out this task.

- Title
- Introduction
- Problem Statement
- Project Objective
- Summary of Supporting Information
- Description of methods employed for data collection
- Data analysis
- Results
- Conclusion and Recommendations
- Appendices (to include actual instruments- questionnaire, interview schedule; also copies of letters sent, received etc.)

## Key Takeaways

- The project is based on the collection of empirical data.
- A distinction is made between qualitative and quantitative data in relation to the two methods of data collection, namely the survey and the interview.
- With regard to the survey, the questionnaire is the primary instrument for data collection.
- The questionnaire may be self-administered or administered by an interviewer and comprises both closed and open-ended items.
- The closed items are of different types.
- The questionnaire is typically sub-divided into sections with each section based on a single sub-topic.
- The supporting information previously sourced informs the creation of the items for the questionnaire.
- Three types of interviews are the structured, the semi-structured and the unstructured.
- The semi-structured is conducted with the help of an interview schedule.
- There are set criteria for asking questions and for probing in an interview.
- Probing is necessary to ensure that all relevant information is obtained.
- The two types of survey data are the qualitative and the quantitative.
- Data are also classified according to levels of measurement, namely nominal, ordinal, interval and ratio. The first two are qualitative and the second two are quantitative.
- Nominal and Ordinal data may be presented using pie charts, and column and bar charts.
- In terms of interview data, the basic strategies for the analysis of qualitative data apply. Creating codes and categories are key to the analysis of qualitative data.
- The writing of the project report represents the final stage of the project.