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# Topic ► Qualitative 9 Research Methods

## LEARNING OUTCOMES

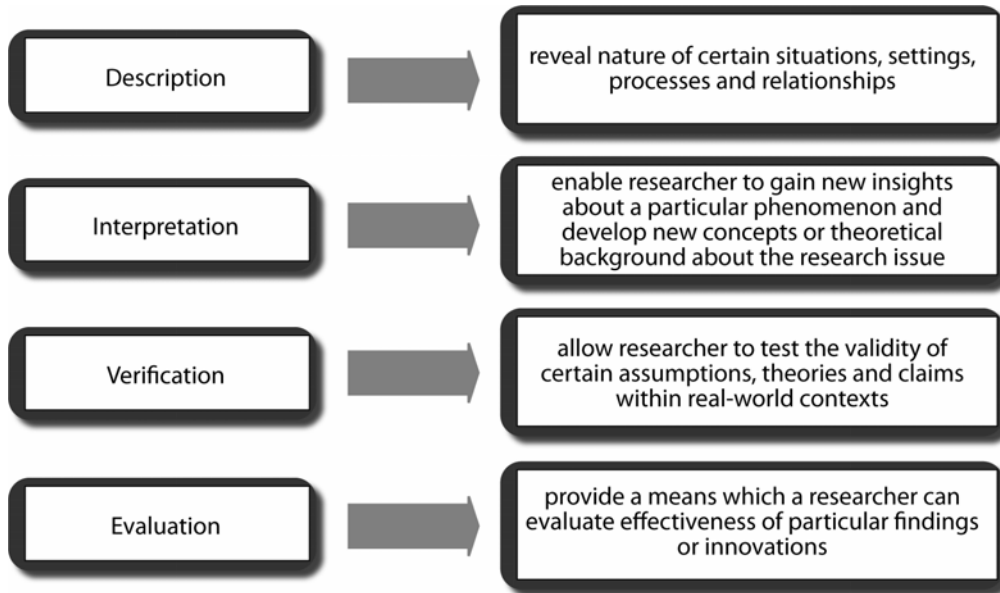
By the end of this topic, you should be able to:

1. Define what is qualitative research method;
2. Describe the types of qualitative research methods;
3. Identify the data analysis of qualitative methods;
4. Elaborate the two methods to administer questionnaires; and
5. Differentiate between quantitative and qualitative methods.

### 9.1 DEFINITION OF QUALITATIVE RESEARCH

The qualitative research method involves the use of qualitative data, such as *interviews*, *documents* and *observation*, in order to understand and explain a social phenomenon. In Information Technology and Communication, there has been a general shift in research away from technological to managerial and organisational issues, and thus there is increasing interest in the application of qualitative research methods. Qualitative research methods originated from social sciences to enable researchers to study social and cultural oriented phenomena. Today, the use of qualitative method and analysis are extended almost to every research field and area. The method generally includes data sources with observation and respondent observation, interviews and questionnaires, documents and the researcher's impression and perception. A good definition is given by Denzin and Lincoln (1994) that a qualitative research focuses on interpretation of phenomena in their natural settings to make sense in terms of the meanings people bring to these settings. The qualitative research

method involves data collection of personal experiences, introspection, stories about life, interviews, observations, interactions and visual texts which are significant to people's life. Qualitative research typically serves one or more of the following purposes (Peshkin,1993) (Figure 9.1):



**Figure 9.1:** Purpose of Quality research  
(Perskin, 1993)

When conducting qualitative research, measuring reliability is difficult. However, we will explore reliability in the next topic.

### 9.1.1 Qualitative Research in Information and Communication Technology

Many researchers in ICT agree that there are many dimensions in research methodology for the field of ICT. The methodology varies in terms of topic of interest, scope, validity of instruments and knowledge body. Researchers also firmly believe that observations are associated with traditional approaches, while interpretations are associated with the newer approaches, which reflect the emphasis of qualitative researchers interacting with research participants in ICT generally. They recommend that information systems researchers should not blindly adopt a research method.

The choice of research method should be made in relation to the research objectives. For example, Lee (2001) suggests that information technology research is more than the study of technology or behaviour. Rather, he suggests that information systems researchers deal "with the phenomena that emerge when the technology and the behaviour interact, much like different chemical elements reacting to one another when they form a compound". There is a growing interest among ICT researchers in various qualitative research techniques. Since 1991, the annual International Conference on Information Systems (ICIS) held a series of panel discussions on aspects relating to qualitative research. These workshops represent an expanding forum for ICT and Information Systems researchers who are considering or actively applying qualitative research. The research results of Lending and Weatherbe(1992) suggest an increase in the application of qualitative research techniques, as indicated by journal publications. However, more recently, there has been a call among the ICT and information systems community for more emphasis on conducting qualitative research.

## 9.2 TYPES OF QUALITATIVE RESEARCH METHODS

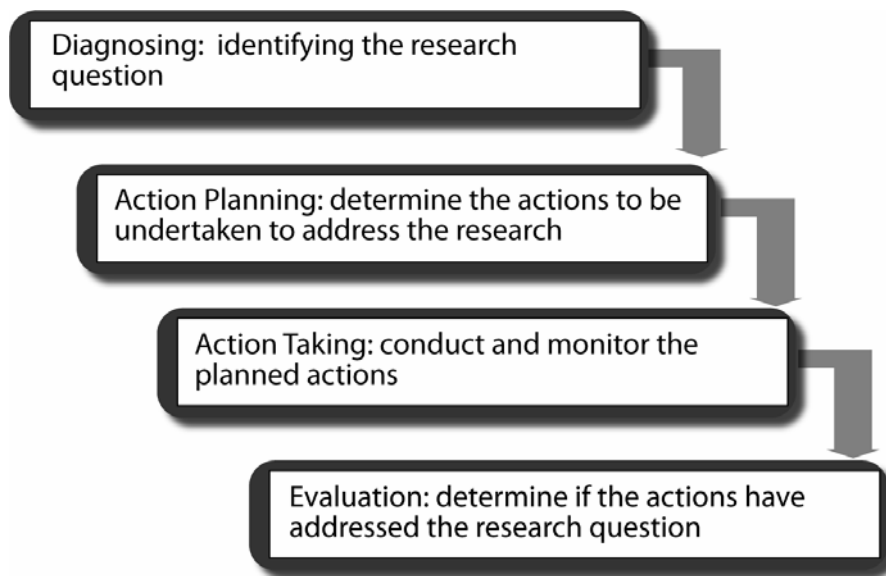
There are many methods in conducting qualitative research in ICT. Types of qualitative research for ICT is shown in Figure 9.2.



**Figure 9.2:** Types of qualitative research for ICT

### 9.2.1 Action Research

Action research is associated with investigation on changes. Cunningham (1993) suggested that action research comprises a continuous process of research and learning in the researcher's long-term relationship with a problem. The intention of action research is to institute a process of change and then draw a conclusion based on this process. Generally, in the field of Information and Communication technology, technologies associated with ICT facilitate changes. Therefore, action research is an appropriate methodology to conduct investigation in ICT. There are 4 stages in the action research cycle (Susman & Evered, 1978) as illustrated in Figure 9.3.



**Figure 9.3:** Stages in action research cycle

There are two reasons for action research in ICT:

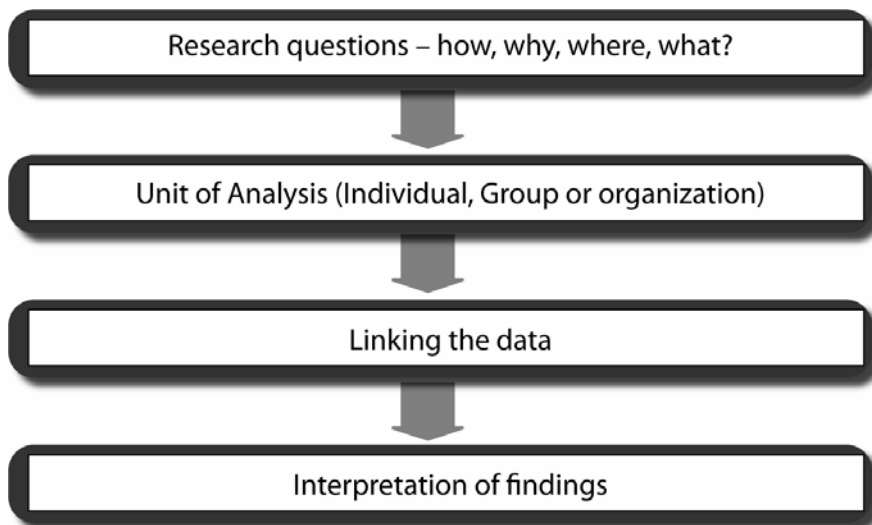
- (a) To involve IT practitioners in their work.; and
- (b) To encourage research with the purpose of bringing improvement in ICT systems, applications and infrastructure.

Action research in ICT refers to both ICT system and people involved in that system. For example, a system administrator employed action research in his organisation to investigate the relationship between the introduction of groupware into an organisation and its implications towards individual work habits and the structure of enterprise architecture (Olesen and Myers, 1999).

### 9.2.2 Case Study

Case study is a method used in both qualitative and quantitative research methodologies. Yin (1994) suggested that case studies are empirical investigation of phenomena within their environmental context, where the relationship between the phenomena and the environment is not clear. Therefore, a case is examined to understand an issue or provide input to an existing theory or a new theoretical concept. A case study's unit of measurement is associated with the entity concept.

A research work deploying the case study method may have single or multiple cases. Conclusion could be drawn up from similarities or differences among the cases involved in a research work. For example, a researcher may use single case design to find the relationship that exists between user participation in systems development and the issue of organisational change surrounding the development and implementation of IT systems (Butler and Fitzgerald, 2001). Figure 9.4 below shows the sequence of case study (Yin 1994) in a research work.



**Figure 9.4:** Sequence of Case Study Method (Yin 1994)

Case studies can be in single or multiple design. Single case design is ideal for studying extreme cases, to confirm or challenge a theory or for cases where a researcher does not have access previously. However, it is important for a researcher to be careful during the interpretation of what is being observed. Multiple case design is appropriate when a researcher is keen to use more than one case to gather data and draw up conclusion based on the facts retrieved. Multiple case design serves to confirm evidence which enhance the reliability and validity of a research work. A good example would be research work done by Hassan and Veeraghavan (2000), using multiple case design to investigate how an organisation may employ data to achieve its objectives through the development of multidimensional databases. In this research work, commonalities and differences among four cases were employed in order to develop conclusions.

### 9.2.3 Ethnography

Ethnography is a qualitative research method which involves a description of people and nature of phenomena. In ICT, ethnographic research method is increasingly employed to investigate information systems generally. Atkinson and Hammersley (1994) suggested that ethnography involves exploring the nature of phenomena and working with unstructured data, analysing data through interpretation of the meanings attributed by research respondents. This method involves primary observations conducted by a researcher during a stipulated period. Normally, ethnographic method for ICT based research is deployed in a large organisation and involves detailed investigation of an entity within its specific context. Therefore, in such a context, detailed qualitative data need to be gathered regarding the body of knowledge. Data that are usually gathered using participant observation include field notes and unstructured interview. One example of ICT research conducted would be work by Nandhakumar and Avison(1999), employing an ethnographic investigation of information system technology development in their organisation.

The ethnographic method needs considerable time and fieldwork committment by the researcher. It can be extremely time consuming as it involves the researcher spending a long time in the observation period and jotting down field notes. There are some standard rules for taking field notes (Neuman and Wiegand, 2000):

**RULES FOR TAKING FIELD NOTES**

- Jot down notes immediately and as soon as possible during observation
- Keep count of the number of phrases used by subjects
- Never neglect anything as insignificant
- Record sequence of events chronologically and period of events
- Avoid evaluative judgments or summarising of retrieved facts and respondents.

*(Neuman and Wiegand, 2000)*

## 9.2.4 Grounded Theory

Grounded theory uses a prescribed set of procedures for analysing data and constructing theoretical model from them. A good definition is given by Glaser and Strauss, (1967) stating it as “the discovery of theory from data systematically obtained social research”. Although it originated from social research, the method now is widely used in ICT and other fields as well.

They also defined that a ‘category’ emerges from the data and may stand by itself as a conceptual element. The term ‘grounded’ refers to the idea where a theory that emerges from the study is derived from and ‘grounded’ in data have been collected in the field rather than taken from the research literature.

Grounded theory is very useful when current theories about a phenomenon are neither inadequate nor non-existent (Cresswell,1998). Data collection for this method is field-based and likely to change over the course of the study. Interviews play a major role in this method but some other techniques like observation, multimedia resources and documents may also be used. One research example using this method is a work by Urquhart (2000) where the author took a qualitative view of analyst-client dialogue and it was designed to explore analyst-client interaction from a processual perspective. Respondents in this research work were involved in the initial stage of system development or modification. Grounded Theory was employed to identify concepts used by respondents in their initial contact regarding system requirements.

### 9.2.5 Content Analysis

A content analysis is a detailed and systematic examination of the contents of a particular material for identifying patterns or themes. It is typically performed on forms of human communication including journals, books, printed media and recorded human interactions. Out of the 5 designs explained in this topic, content analysis involves thorough planning from the beginning itself. Research problem or research questions need to be specified from the beginning. In ICT research, content analysis seems crucial especially when dealing with emails, online discussions and forums. Most content analyses aimed to answer questions directly to the research problem stated in a study.

Some steps in content analysis are:

- (a) **Identify the specific body of material needed to be explored**  
For example, you may be interested in finding evidence for enterprise architecture using XML and CORBA in service-oriented organisation. In this case, the specific body of material to be explored will be enterprise architecture using XML and CORBA.
- (b) **Define the characteristics or qualities to be examined in precise terms**  
A researcher may identify specific examples of each characteristic as a way of defining it more clearly.
- (c) **Break into small and manageable segments** of materials if it is too complex or lengthy.
- (d) A researcher should *scrutinise and sort the materials* based on the defined characteristics.



#### SELF-CHECK 9.1

Identify types of qualitative research methods.



## 9.3 QUALITATIVE DATA ANALYSIS

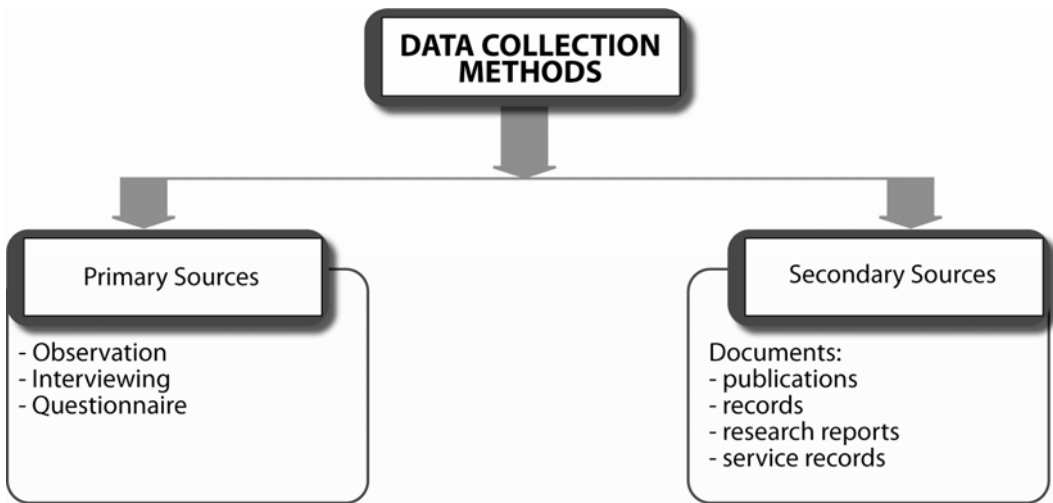
Qualitative data is a pool of data obtained from interviews, fieldnotes of observations and analysis of documents. This collected information must be organised and interpreted properly to extract the key findings for your research work. As a rule of thumb, there is no single 'right' way for qualitative data analysis. Different researchers have proposed different methods for qualitative data analysis. However, there are some common procedures in the analysis of qualitative data. A researcher begins with a large body of knowledge and information and must deploy inductive reasoning, sorting and categorisation and make it precise with key themes. For example in the content analysis method, it might seem very straightforward but you need to be careful in extracting information that has meaningful characteristics to your research theme. Creswell (1998) came up with data analysis spiral that is applicable to most qualitative methods. There are several steps for this analysis. These steps are:

- (a) Data organisation into several forms (i.e. database, sentences or individual words);
- (b) Peruse the data sets several times to gain a complete picture or overview of what it contains as a whole. During the process, a researcher should jot down short notes or summarisation of the key points that suggest possible categories or interpretations;
- (c) Identify of general categories or themes and classify them accordingly. This will help a researcher to see a pattern or meaning of the data obtained; and
- (d) Finally, integrate and summarise the data for the audience. This step also may include hypotheses that state the relationships among those categories defined by the researcher. The data summary could be represented by table, figure or matrix diagram.

### 9.3.1 Data Collection Methods

In research methodology, data collection methods are given great emphasis. Data are categorised as primary data and secondary data. Data collection and research method are inextricably interdependent. A researcher who takes into account a methodology for his/ her research work must consider the nature of data that will be collected in the resolution of a problem. We can also say that the data dictate the research method of a particular field. Primary data are collected from primary sources and secondary data gathered from secondary sources.

Various methods of data collection are as follows:



**Figure 9.5:** Data collection methods

You must know that none of the mentioned methods will provide 100 percent accuracy and reliable information. This is because the quality of data depends on some factors which we will be explored in the next section.

### 9.3.2 Data Collection Using Primary Sources

The choice of data collection method depends on the objective and aim of the research. Whatever method you use for data collection, always ensure that you understand clearly the purpose and the relevance of the study. The same goes for your respondent. So, you must clearly state to them so that they know the aim of the study and could give the feedback accordingly in the mode of questionnaire or interviews. Primary sources of data collection are as follows:

(a) **Observation**

Observation is a systematic way of watching and listening to a phenomenon as it takes place. Observation would serve as the best approach if a researcher is interested in behaviour rather than perceptions of respondents or when the subjects are so involved in it that they are unable to provide objective information about it. There are two types of observation – participant and non-participant. Participant observation is when a researcher participates in the activities of the study group that is being observed in the same manner as its members without their knowledge that they are being observed. Non-participation observation, on the other hand, is when a researcher does not get involved directly in the

activities of the research study but remains a passive observer. In ICT research, non-participant observation takes place most of the time especially when it involves design and implementation issues.

(b) **Interview**

Interview is method to collect information from people is referred to as interview. Another precise definition is that any person-to-person interaction between two or more individuals with a specific purpose in mind is called an interview (Ranjit Kumar 2001). There are two main types of interviews:

- (i) **Unstructured Interviews** – This type gives complete freedom in terms of content and structure. In ICT, unstructured interviews are often deployed due to the broad nature of the field. You have complete freedom in terms of the wording to use and may formulate questions that suit your topic of discussion. Some unstructured interview examples are in-depth interviews, focus group interviews, narratives and oral interviews.
- (ii) **Structured Interviews** – In structured interviews, you can ask a predetermined set of questions using the same wording and order of questions as specified in the interview sequence. Interview sequence is a schedule that lists the set of questions, open-ended or close-ended which is prepared by the researcher for use of interaction between him/her and the respondents. It is important to highlight here that the interview sequence is a research tool or instrument for collecting data whereas interviewing is a method of data collection. One of the benefits of using structured interviews is that it ensures data comparability.

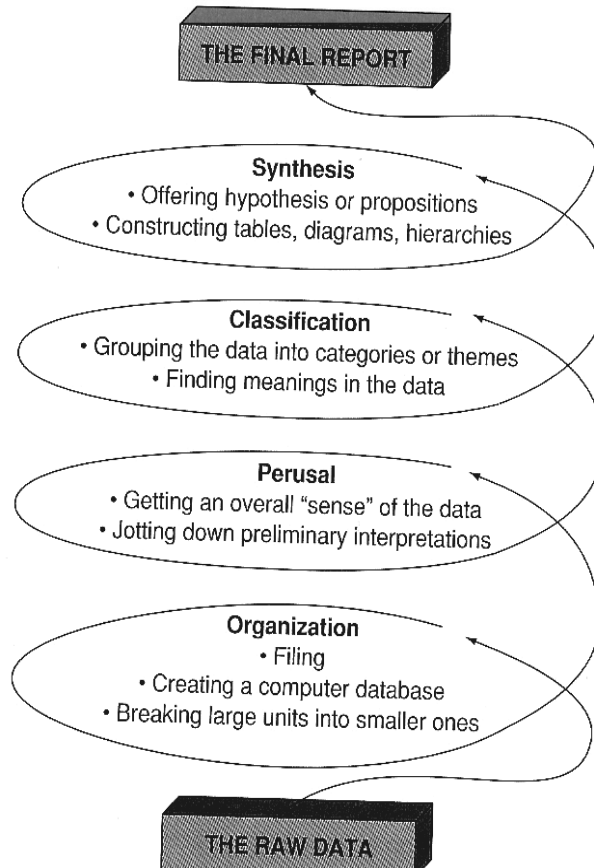
(c) **Questionnaire**

One of the most important techniques of data collection is questionnaire. A questionnaire is a list of written questions to be answered by respondents of a particular study. When designing a questionnaire, it is important to ensure the questions are clear and easy to understand. This is because respondents need to understand the questions clearly before answering. An interactive approach should be considered during questionnaire design. The advantage of the questionnaire is that it offers great anonymity between researcher and respondents and this increases the likelihood of obtaining accurate information. On the other hand, it is less expensive to be deployed in research as you can save time, human and financial resources, and particularly for population study, it is an inexpensive technique of data collection. There are 2 ways to administer a questionnaire as shown in Table 9.1.

**Table 9.1:** Ways to administer questionnaires

No.	Ways to administer	Description
1	<i>Collective administration</i>	The best way of administering questionnaire is by obtaining a captive audience such as a group, member of an organisation, IT administrators in companies, software engineers and people assembled in one place.
2	<i>Mailed questionnaire</i>	A Common approach is to send questionnaire to respondents using email or snail mail. If using snail mail, normally the questionnaire will be accompanied by a cover letter and self-addressed envelope. In ICT, it is common to use e-mail based invitation which leads to a web form of questionnaire, which is rather convenient, fast and manageable.

Next, let us look at the data analysis spiral, as illustrated by Creswell, 1998, in Figure 9.6.



**Figure 9.6:** Data analysis spiral (Creswell,1998)

**Source:** Adapted from <http://www.thearney.com/Scholar%20Folio/Schola1.gif>

Data analysis for qualitative methods is more time consuming compared to quantitative methods. This is due to the loads of information you may obtain during the entire research process. It is important for a researcher to set aside some information because not everything gathered will be useful.



### SELF-CHECK 9.2

1. Describe the types of interview method for qualitative approach.
2. Distinguish between primary and secondary data sources.

## 9.4 DIFFERENCE BETWEEN QUANTITATIVE AND QUALITATIVE APPROACH

There are some differences between quantitative and qualitative approach in research methodology. In ICT, both methods play a significant role in facilitating the entire research process and leading to desirable results or outcomes. Qualitative research tends to focus on the subject or respondents instead of perspective of the researcher. This is also termed as the emic or insider perspective as against etic or outsider perspective. A researcher is always the main in data collection and analysis in qualitative approach, compared to questionnaire or tests in case of quantitative approach.

Qualitative method also involves field work where a researcher must participate in the setting especially for observation and interviews with respondents of the research topic. Table 9.2 lists the differences between qualitative and quantitative research.

**Table 9.2:** Differences between qualitative and quantitative research  
(Adapted from Merriam, 1999; Firestone, 1987; Potter, 1996)

	Qualitative	Quantitative
<b>Focus</b>	Quality (features)	Quantity (how much, numbers)
<b>Philosophy</b>	Phenomenology	Positivism
<b>Method</b>	Ethnography/Observation	Experiments/Correlation
<b>Goal</b>	Understand, meaning	Prediction, test hypothesis
<b>Design</b>	Flexible, emerging	Structured, predetermined
<b>Sample</b>	Small, purposeful	Large, random, representation
<b>Data collection</b>	Interviews, observation, documents and artefacts	Questionnaire, scales, tests, inventories
<b>Analysis</b>	Inductive (by the researcher)	Deductive (by statistical methods)
<b>Findings</b>	Comprehensive, description detailed, holistic	Precise, numerical
<b>Researcher</b>	Immersed	Detached

Generally, qualitative research adopts the inductive approach. Such a method is conducted due to lack of theory related to the research topic that is unable to explain a phenomenon convincingly. A qualitative approach also focuses on process and understanding based on rich description of body of knowledge. Data takes the form of communication of the respondents itself, extracts from research

documents, multimedia resources like audio and video recordings. These also supports the finding of a study.



### SELF-CHECK 9.3

1. What are the steps involved in qualitative data analysis?
2. Identify the differences between qualitative and quantitative research.

## SUMMARY .....

- Qualitative research method involves the use of qualitative data, such as interviews, documents, and respondents observation, to understand and explain social phenomena.
- Qualitative method focuses on **interpretation** of situations or phenomena in their natural settings.
- Types of qualitative methods are **Action Research, Case Study, Ethnography, Grounded Theory** and **Content Analysis**.
- Primary data sources comprise **observation, interviewing** and **questionnaires**.
- **Interviewing** is a technique of gathering data from respondents by asking questions and reacting verbally.
- **Secondary data** sources correspond to documents such as publications, records, earlier research reports and service records.
- **Collective administration** and **mailed questionnaires** are two most used techniques in questionnaires distribution to respondents.
- **Qualitative** is **inductive** whereas **quantitative** follows **deductive methodology**.
- Action research adopts a spiral approach comprising 4 steps: **planning, acting, observing and reflecting**.
- A qualitative case study is intensive, has holistic description and analysis of single instance of a phenomenon.
- **Ethnography** is qualitative research method which involves a description of people and nature of phenomena.

- The **inductive approach** that is used in qualitative method begins by observing phenomena, then proceeding to find patterns in the form of categories or concepts that emerge.

## KEY TERMS

Qualitative methods	Ethnography
Action research	Content analysis
Primary data sources	Grounded theory
Case study	Interviews
Secondary data sources	Inductive approach



## DISCUSSION

1. Consider the following list of research problems and explain what would be the most appropriate qualitative research method for each one:
  - (a) Performance Evaluation for Voice of IP (VoIP) in Streaming environment.
  - (b) An Evaluation of Latency in Campus Network.
2. "There are many dimensions in research methodology for ICT". Discuss.



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### **Internet Resources**

Topic 15: Interviewing in qualitative research (n.d)  
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Two explanation of content analysis (n.d)  
[http://www.uiowa.edu/~commstud/adclass/research/content\\_analysis.html](http://www.uiowa.edu/~commstud/adclass/research/content_analysis.html)