

Software Analysis and Design



DATA COLLECTION METHODS/TECHNIQUES

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Data collection

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- The process of gathering raw facts or evidence about a subject of interest in a systematic way, that enables one to answer stated research questions and evaluate outcomes.
- It can also be defined as gathering of information (figures, words or responses) that describes some situation from which conclusions can be drawn.

Data collection methods

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- Data-collection methods allow us to **systematically** collect information about our objects of study (people, objects) and about the settings in which they occur.
- Data collection tools are instruments that are used hand in hand with the data collection methods to collect/retrieve data.
- To avoid confusion in the use of terms, the following table points out the distinction between techniques and tools applied in data collection.

Data collection techniques and tools



Techniques	Tools
• Administering written questionnaires.	• Questionnaire.
• Interviewing	• Interview guide, checklist, tape recorder.
• Observation	• Eyes and other senses, pen/paper, microscope.
• Using available information	• Check lists, data compilation forms.

Approaches to data collection



- There are two major approaches to gathering information about a situation, person, problem or phenomenon.
- Sometimes, information required is already available and need only to be extracted.
- However, there are times when the information must be collected fresh from field.
- Based upon these two broad approaches to information gathering, data in scientific research are categorized as;

Types of data



- Secondary data
- Primary data
- **Secondary data:** Data that previously may have been collected for other purposes but can be used in the immediate study.
- Examples of secondary sources include the use of population census data to obtain information on age-sex structure of a population, use of organizations' records, use of hospitals records, and collection of data from sources such as journals, magazines, books and other periodicals.
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Primary data



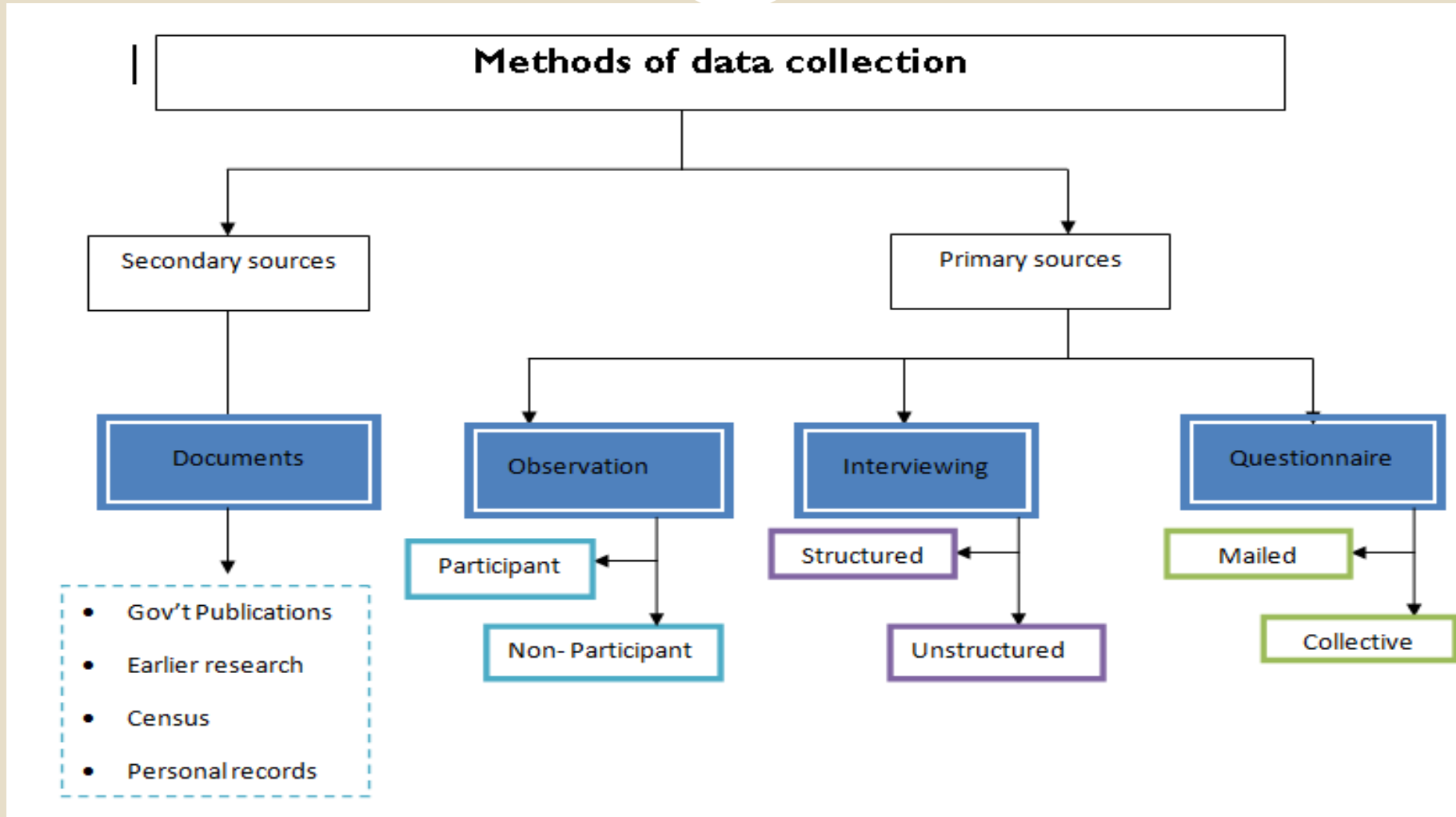
- **Primary data:** Raw data that has been originally collected by the researcher specifically for the study at hand.
- Examples of information from primary sources include; interviewing community inhabitants to find out their attitudes towards health services, using questionnaires to determine the level of job satisfaction of employees in an organization, observing students behaviors in class etc
- In conclusion, primary sources provide first hand data and secondary sources provide second hand data.

Exercise



- Discuss the advantages and disadvantages of:
 - Primary data
 - Secondary data

Data collection methods



The questionnaire



- A questionnaire is a written list of questions, the answers to which are recorded by respondents.
- In questionnaire respondents read the question, interpret what is expected and write down the answers.
- Unlike an interview guide in which the researcher may explain the meaning of some questions, in the case of questionnaire, there is no one to explain the meaning of questions to respondents.
- Therefore questions in a questionnaire must be clear and easy to understand.

Ways of administering a questionnaire



- A questionnaire can be administered in different ways..
 - **A mailed questionnaire** – one approach to collecting information is to send the questionnaire to prospective respondents by mail. Obviously, this method presupposes that you have access to their address. One of the major problems with this approach is the low response rate.
 - **Collective administration** – one of the best ways of administering questionnaires is to obtain a captive audience such as students in a class room, people attending a function, or people assembled in one place. This ensures a high response rate as you will find very few people refusing to participate in your study.

Contents of a questionnaire cover letter



- It is essential that you write a cover letter to accompany your questionnaire. It should very briefly:
 - Introduce you and the institution you are representing.
 - Describe in two or three lines the main objective of the study.
 - Convey any general instructions.
 - Assure respondents of the anonymity of the information provided by them.
 - Provide a contact number incase they have questions.
 - Give them a return address for the questionnaire and a deadline for its return.
 - Thank them for their participation.

Questionnaires...



Advantages	Disadvantages
•Less expensive to administer mostly if the collective method is used.	•Limited application.
•Able to collect information from a larger sample	•Lack of opportunity to clarify issues.
• it offers greater anonymity.	•Low response rate.
	•It is possible to consult others.
	• Spontaneous responses may not be possible mostly if it's a mailed questionnaire.

Forms of questions in a questionnaire



- In a questionnaires, questions may be formulated as;
 - Closed ended or
 - Open ended
- In a **closed-ended** question, the possible answers are set out in the questionnaire and the respondent ticks the category that best describes the respondents answer. E.g.
 - *Please tick the type of research you would love to undertake.*
Applied research Basic Research descriptive research quantitative
- In **open ended** questions, the possible responses are not given. The respondent writes down the answers in his/her words. E.g.
 - *Please explain why you opted for a Bachelors degree in Information technology?*

Considerations in formulating questions



- The **wording** and the **tone** of your question is important because the information and its quality largely depend upon these factors.
- It is therefore important to be careful about the way you formulate questions.
- Some considerations to keep in mind when formulating questions are as follows:

Considerations in formulating questions



- *Always use simple and everyday language.* Take extra care to use words that your respondents will understand as you may not have the opportunity to explain questions to them. Words like; “*is your family a dipsomaniac*” may be hard for respondents to interpret.
- *Do not ask double barrelled questions.* A double barrelled question is a question within a question. E.g. “*How often and how much time do you spend in the computer lab*”?

Considerations in formulating questions



- *Do not ask leading questions* – these are questions in which, by their nature, contents, structure or wording leads a respondent to answer in a certain direction. E.g. “unemployment is increasing at a very high rate isn’t it” or “smoking is bad isn’t it?”
- *The order of questions also matters.* Questions should follow a logical progression based upon the objectives of the study.

When to use a questionnaire?

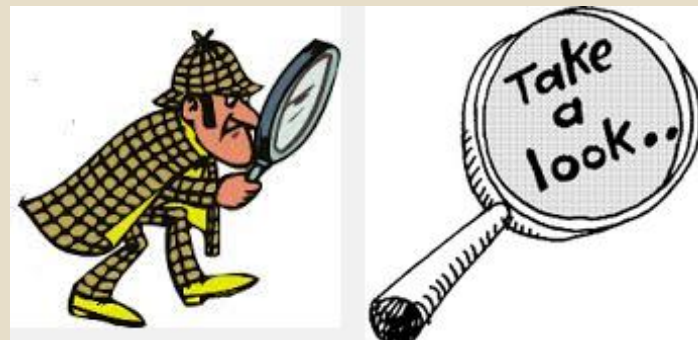


- When resources and money are limited.
- When it is necessary to protect the privacy of the participants.
- When you want to collect data from a relatively bigger population.
- Etc..

Other Data Collection Techniques-Observation



- Observation is about spending time observing users during their daily routine to have an extra information on their activities. Observation is called “**Shadowing**” when the users are reluctant to release the information. In that situation, the analyst/researcher observes the user without this latter knowing.



Other Data Collection Techniques- Focus Group



- Structured interviews with small groups of individuals using standardized questions, follow-up questions, and exploration of other topics that arise to better understand participants



Other Data Collection Techniques- JAD



- The idea behind **Joint Application Development (JAD)** is to structure the requirements determination phase of analysis and the reviews that occur as part of the design. Users, managers, and systems developers are brought together for a series of intensive structured meetings run by a JAD session leader.



Data Quality Dimensions

