

# MODULE 4

## METHODS OF DATA COLLECTION

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The task of data collection begins after a research problem has been defined and research design/plan chalked out. While deciding about the method of data collection to be used for the study, the researcher should keep in mind two types of data viz., primary and secondary. The *primary data* are those which are collected afresh and for the first time, and thus happen to be original in character.

The *secondary data*, on the other hand, are those which have already been collected by someone else and which have already been passed through the statistical process. The researcher would have to decide which sort of data he would be using (thus collecting) for his study and accordingly he will have to select one or the other method of data collection. The methods of collecting primary and secondary data differ since primary data are to be originally collected, while in case of secondary data the nature of data collection work is merely that of compilation. We describe the different methods of data collection, with the pros and cons of each method.

### **COLLECTION OF PRIMARY DATA**

We collect primary data during the course of doing experiments in an experimental research but in case we do research of the descriptive type and perform surveys, whether sample surveys or census surveys, then we can obtain primary data either through observation or through direct communication with respondents in one form or another or through personal interviews. This, in other words, means that there are several methods of collecting primary data, particularly in surveys and descriptive researches. Important ones are: (i) observation method, (ii) interview method, (iii) through questionnaires, (iv) Through schedules, and (v) other methods which include (a) warranty cards; (b) distributor audits; (c) pantry audits; (d) consumer panels; (e) using mechanical devices; (f) through projective techniques; (g) depth interviews, and (h) content analysis. We briefly take up each method separately

### **I. OBSERVATION METHOD**

The observation method is the most commonly used method especially in studies relating to behavioral sciences. In a way we all observe things around us, but this sort of observation is not scientific observation. Observation becomes a scientific

tool and the method of data collection for the researcher, when it serves a formulated research purpose, is systematically planned and recorded and is subjected to checks and controls on validity and reliability. Under the observation method, the information is sought by way of investigator's own direct observation without asking from the respondent. For instance, in a study relating to consumer behavior, the investigator instead of asking the brand of wrist watch used by the respondent, may himself look at the watch. The main advantage of this method is that subjective bias is eliminated, if observation is done accurately. Secondly, the information obtained under this method relates to what is currently happening; it is not complicated by either the past behavior or future intentions or attitudes. Thirdly, this method is independent of respondents' willingness to respond and as such is relatively less demanding of active cooperation on the part of respondents as happens to be the case in the interview or the questionnaire method. This method is particularly suitable in studies which deal with subjects (i.e., respondents) who are not capable of giving verbal reports of their feelings for one reason or the other

However, observation method has various limitations. Firstly, it is an expensive method. Secondly, the information provided by this method is very limited. Thirdly, sometimes unforeseen factors may interfere with the observational task. At times, the fact that some people are rarely accessible to direct observation creates obstacle for this method to collect data effectively.

Sometimes we talk of *controlled* and *uncontrolled observation*. If the observation takes place in the natural setting, it may be termed as uncontrolled observation, but when observation takes place according to definite pre-arranged plans, involving experimental procedure, the same is then termed controlled observation. In non-controlled observation, no attempt is made to use precision instruments.

The major aim of this type of observation is to get a spontaneous picture of life and persons. It has a tendency to supply naturalness and completeness of behavior, allowing sufficient time for observing it. But in controlled observation, we use mechanical (or precision) instruments as aids to accuracy and standardization. Such observation has a tendency to supply formalized data upon which Generalizations can be built with some degree of assurance. The main pitfall of non-controlled observation is that of subjective interpretation. There is also the danger of having the feeling that we know more about the observed phenomena than we actually do. Generally, controlled observation takes place in various experiments that are carried out in a laboratory or under controlled conditions, whereas uncontrolled observation is resorted to in case of exploratory researches.

## II. INTERVIEW METHOD

The interview method of collecting data involves presentation of oral-verbal stimuli and reply in terms of oral-verbal responses. This method can be used through personal interviews and, if possible, through telephone interviews.

**(a) Personal interviews:** Personal interview method requires a person known as the interviewer asking questions generally in a face-to-face contact to the other person or persons. (At times the interviewee may also ask certain questions and the interviewer responds to these, but usually the interviewer initiates the interview and collects the information.) This sort of interview may be in the form of direct personal investigation or it may be indirect oral investigation. In the case of direct personal investigation the interviewer has to collect the information personally from the sources concerned. He has to be on the spot and has to meet people from whom data have to be collected.

This method is particularly suitable for intensive investigations. But in certain cases it may not be possible or worthwhile to contact directly the persons concerned or on account of the extensive scope of enquiry, the direct personal investigation technique may not be used. In such cases an indirect oral examination can be conducted under which the interviewer has to cross-examine other persons who are supposed to have knowledge about the problem under investigation and the information, obtained is recorded. Most of the commissions and committees appointed by government to carry on investigations make use of this method.

The method of collecting information through personal interviews is usually carried out in unstructured way. As such we call the interviews as *structured interviews*. The *unstructured interviews* are characterized by flexibility of approach to questioning. Unstructured interviews do not follow a system of pre-determined questions and standardized techniques of recording information

### Advantages of Personal Interview method

- More information and that too in greater depth can be obtained.
- Interviewer by his own skill can overcome the resistance, if any, of the respondents; the interview method can be made to yield an almost perfect sample of the general population.
- There is greater flexibility under this method as the opportunity to restructure questions is always there, especially in case of unstructured interviews.

- Observation method can as well be applied to recording verbal answers to various questions.
- Personal information can as well be obtained easily under this method.
- Samples can be controlled more effectively as there arises no difficulty of the missing returns; non-response generally remains very low.
- The interviewer can usually control which person(s) will answer the questions. This is not possible in mailed questionnaire approach. If so desired, group discussions may also be held.
- The interviewer may catch the informant off-guard and thus may secure the most spontaneous reactions than would be the case if mailed questionnaire is used.
- The language of the interview can be adapted to the ability or educational level of the person interviewed and as such misinterpretations concerning questions can be avoided.
- The interviewer can collect supplementary information about the respondent's personal characteristics and environment which is often of great value in interpreting results.

### **Disadvantages of Personal Interview method**

- It is a very expensive method, especially when large and widely spread geographical sample is taken.
- There remains the possibility of the bias of interviewer as well as that of the respondent; there also remains the headache of supervision and control of interviewers.
- Certain types of respondents such as important officials or executives or people in high income groups may not be easily approachable under this method and to that extent the data may prove inadequate.
- This method is relatively more-time-consuming, especially when the sample is large and recalls upon the respondents are necessary.
- The presence of the interviewer on the spot may over-stimulate the respondent, sometimes even to the extent that he may give imaginary information just to make the interview interesting.
- Under the interview method the organization required for selecting, training and supervising the field-staff is more complex with formidable problems.
- Interviewing at times may also introduce systematic errors.
- Effective interview presupposes proper rapport with respondents that would facilitate free and frank responses. This is often a very difficult requirement.

**(b) Telephone interviews:** This method of collecting information consists in contacting respondents on telephone itself. It is not a very widely used method, but plays important part in industrial surveys, particularly in developed regions.

#### **Advantages of Telephone Interview method**

- It is more flexible in comparison to mailing method.
- It is faster than other methods i.e., a quick way of obtaining information.
- It is cheaper than personal interviewing method; here the cost per response is relatively low.
- Recall is easy; callbacks are simple and economical.
- There is a higher rate of response than what we have in mailing method; the non-response is generally very low.
- Replies can be recorded without causing embarrassment to respondents.
- Interviewer can explain requirements more easily.
- At times, access can be gained to respondents who otherwise cannot be contacted for one reason or the other.
- No field staff is required.
- Representative and wider distribution of sample is possible.

#### **Disadvantages of Telephone Interview method**

- Little time is given to respondents for considered answers; interview period is not likely to exceed five minutes in most cases.
- Surveys are restricted to respondents who have telephone facilities.
- Extensive geographical coverage may get restricted by cost considerations.
- It is not suitable for intensive surveys where comprehensive answers are required to various questions.
- Possibility of the bias of the interviewer is relatively more.
- Questions have to be short and to the point; probes are difficult to handle.

### **III. THROUGH QUESTIONNAIRES**

This method of data collection is quite popular, particularly in case of big enquiries. It is being adopted by private individuals, research workers, private and public organizations and even by governments.

In this method a questionnaire is sent (usually by post) to the persons concerned with a request to answer the questions and return the questionnaire. A

questionnaire consists of a number of questions printed or typed in a definite order on a form or set of forms. The questionnaire is mailed to respondents who are expected to read and understand the questions and write down the reply in the space meant for the purpose in the questionnaire itself. The respondents have to answer the questions on their own.

Before using this method, it is always advisable to conduct 'pilot study' (Pilot Survey) for testing the questionnaires. In a big enquiry the significance of pilot survey is felt very much. Pilot survey is in fact the replica and rehearsal of the main survey. Such a survey, being conducted by experts, brings to the light the weaknesses (if any) of the questionnaires and also of the survey techniques. From the experience gained in this way, improvement can be effected.

### **Main aspects of a questionnaire**

Quite often questionnaire is considered as the heart of a survey operation. Hence it should be very carefully constructed. If it is not properly set up, then the survey is found to fail. This fact requires us to study the main aspects of a questionnaire viz., the general form, question sequence and question formulation and wording. Researcher should note the following with regard to these three main aspects of a questionnaire:

**1. General form:** So far as the general form of a questionnaire is concerned, it can either be structured or unstructured questionnaire. Structured questionnaires are those questionnaires in which there are definite, concrete and pre-determined questions. The questions are presented with exactly the same wording and in the same order to all respondents. Resort is taken to this sort of standardization to ensure that all respondents reply to the same set of questions. The form of the question may be either closed (i.e., of the type 'yes' or 'no') or open (i.e., inviting free response) but should be stated in advance and not constructed during questioning.

**2. Question sequence:** In order to make the questionnaire effective and to ensure quality to the replies received, a researcher should pay attention to the question-sequence in preparing the questionnaire. A proper sequence of questions reduces considerably the chances of individual questions being misunderstood. The question-sequence must be clear and smoothly-moving, meaning thereby that the relation of one question to another should be readily apparent to the respondent, with questions that are easiest to answer being put in the beginning. The first few questions are particularly important because they are likely to influence the attitude



of the respondent and in seeking his desired cooperation. The opening questions should be such as to arouse human interest. The following type of questions should generally be avoided as opening questions in a questionnaire:

1. Questions that put too great a strain on the memory or intellect of the respondent;
2. Questions of a personal character;
3. Questions related to personal wealth, etc.

**3. Question formulation and wording:** With regard to this aspect of questionnaire, the researcher should note that each question must be very clear for any sort of misunderstanding can do irreparable harm to a survey. Question should also be impartial in order not to give a biased picture of the true state of affairs. Questions should be constructed with a view to their forming a logical part of a well thought out tabulation plan. In general, all questions should meet the following standards—(a) should be easily understood; (b) should be simple i.e., should convey only one thought at a time; (c) should be concrete and should conform as much as possible to the respondent's way of thinking. (For instance, instead of asking, "How many razor blades do you use annually?" The more realistic question would be to ask, "How many razor blades did you use last week?" Researcher must pay proper attention to the wordings of questions since reliable and meaningful returns depend on it to a large extent. Since words are likely to affect responses, they should be properly chosen. Simple words, which are familiar to all respondents, should be employed. Words with ambiguous meanings must be avoided. Similarly, danger words, catch-words or words with emotional connotations should be avoided. Caution must also be exercised in the use of phrases which reflect upon the prestige of the respondent. Question wording, in no case, should bias the answer. In fact, question wording and formulation is an art and can only be learnt by practice.

### **Essentials of a good questionnaire**

To be successful, questionnaire should be comparatively short and simple i.e., the size of the questionnaire should be kept to the minimum. Questions should proceed in logical sequence moving from easy to more difficult questions. Personal and intimate questions should be left to the end. Technical terms and vague expressions capable of different interpretations should be avoided in a questionnaire. Questions may be dichotomous (yes or no answers), multiple choice (alternative answers listed) or open-ended. The latter type of questions is often difficult to analyze and hence should be avoided in a questionnaire to the extent possible. There should be

some control questions in the questionnaire which indicate the reliability of the respondent.

For instance, a question designed to determine the consumption of particular material may be asked first in terms of financial expenditure and later in terms of weight. The control questions, thus, introduce a cross-check to see whether the information collected is correct or not. Questions affecting the sentiments of respondents should be avoided. Adequate space for answers should be provided in the questionnaire to help editing and tabulation. There should always be provision for indications of uncertainty, e.g., “do not know,” “no preference” and so on. Brief directions with regard to filling up the questionnaire should invariably be given in the questionnaire itself. Finally, the physical appearance of the questionnaire affects the cooperation the researcher receives from the recipients and as such an attractive looking questionnaire, particularly in mail surveys, is a plus point for enlisting cooperation.

The quality of the paper, along with its color, must be good so that it may attract the attention of recipients.

### **Advantages of Questionnaires Method**

- There is low cost even when the universe is large and is widely spread geographically.
- It is free from the bias of the interviewer; answers are in respondents' own words.
- Respondents have adequate time to give well thought out answers.
- Respondents, who are not easily approachable, can also be reached conveniently.
- Large samples can be made use of and thus the results can be made more dependable and reliable.

### **Disadvantages of Questionnaires Method**

- Low rate of return of the duly filled in questionnaires; bias due to no-response is often indeterminate.
- It can be used only when respondents are educated and cooperating.
- The control over questionnaire may be lost once it is sent.
- There is inbuilt inflexibility because of the difficulty of amending the approach once questionnaires have been dispatched.
- There is also the possibility of ambiguous replies or omission of replies altogether to certain questions; interpretation of omissions is difficult.



- It is difficult to know whether willing respondents are truly representative.
- This method is likely to be the slowest of all

#### **IV. THROUGH SCHEDULES**

This method of data collection is very much like the collection of data through questionnaire, with little difference which lies in the fact that schedules (proforma containing a set of questions) are being filled in by the enumerators who are specially appointed for the purpose. These enumerators along with schedules go to respondents, put to them the questions from the proforma in the order the questions are listed and record the replies in the space meant for the same in the proforma. In certain situations, schedules may be handed over to respondents and enumerators may help them in recording their answers to various questions in the said schedules. Enumerators explain the aims and objects of the investigation and also remove the difficulties which any respondent may feel in understanding the implications of a particular question or the definition or concept of difficult terms. This method requires the selection of enumerators for filling up schedules or assisting respondents to fill up schedules and as such enumerators should be very carefully selected. The enumerators should be trained to perform their job well and the nature and scope of the investigation should be explained to them thoroughly so that they may well understand the implications of different questions put in the schedule. Enumerators should be intelligent and must possess the capacity of cross examination in order to find out the truth. Above all, they should be honest, sincere, and hardworking and should have patience and perseverance.

#### **Difference between Questionnaires and Schedules**

Both questionnaire and schedule are popularly used methods of collecting data in research surveys.

There is much resemblance in the nature of these two methods and this fact has made many people to remark that from a practical point of view, the two methods can be taken to be the same. But from the technical point of view there is difference between the two. The important points of difference are as under:

1. The questionnaire is generally sent through mail to informants to be answered as specified in a covering letter, but otherwise without further assistance from the sender. The schedule is generally filled out by the research worker or the enumerator, who can interpret questions when necessary.

2. To collect data through questionnaire is relatively cheap and economical since we have to spend money only in preparing the questionnaire and in mailing the same to respondents.

Here no field staff required. To collect data through schedules is relatively more expensive since considerable amount of money has to be spent in appointing enumerators and in importing training to them. Money is also spent in preparing schedules.

3. Non-response is usually high in case of questionnaire as many people do not respond and many return the questionnaire without answering all questions. Bias due to non-response often remains indeterminate. As against this, non-response is generally very low in case of schedules because these are filled by enumerators who are able to get answers to all questions. But there remains the danger of interviewer bias and cheating.

4. In case of questionnaire, it is not always clear as to who replies, but in case of schedule the identity of respondent is known.

5. The questionnaire method is likely to be very slow since many respondents do not return the questionnaire in time despite several reminders, but in case of schedules the information is collected well in time as they are filled in by enumerators.

6. Personal contact is generally not possible in case of the questionnaire method as questionnaires are sent to respondents by post who also in turn returns the same by post. But in case of schedules direct personal contact is established with respondents.

7. Questionnaire method can be used only when respondents are literate and cooperative, but in case of schedules the information can be gathered even when the respondents happen to be illiterate.

8. Wider and more representative distribution of sample is possible under the questionnaire method, but in respect of schedules there usually remains the difficulty in sending enumerators over a relatively wider area.

9. Risk of collecting incomplete and wrong information is relatively more under the questionnaire method, particularly when people are unable to understand questions properly. But in case of schedules, the information collected is generally complete and accurate as enumerators can remove the difficulties, if any, faced by respondents in correctly understanding the questions. As a result, the information collected through schedules is relatively more accurate than that obtained through questionnaires.

10. The success of questionnaire method lies more on the quality of the questionnaire itself, but in the case of schedules much depends upon the honesty and competence of enumerators.

11. In order to attract the attention of respondents, the physical appearance of questionnaire must be quite attractive, but this may not be so in case of schedules as they are to be filled in by enumerators and not by respondents.

12. Along with schedules, observation method can also be used but such a thing is not possible while collecting data through questionnaires.

## V. SOME OTHER METHODS OF DATA COLLECTION

**1. Warranty cards:** Warranty cards are usually postal sized cards which are used by dealers of consumer durables to collect information regarding their products. The information sought is printed in the form of questions on the 'warranty cards' which is placed inside the package along with the product with a request to the consumer to fill in the card and post it back to the dealer.

**2. Distributor or store audits:** Distributor or store audits are performed by distributors as well as manufactures through their salesmen at regular intervals. Distributors get the retail stores audited through salesmen and use such information to estimate market size, market share, seasonal purchasing pattern and so on. The data are obtained in such audits not by questioning but by observation. For instance, in case of a grocery store audit, a sample of stores is visited periodically and data are recorded on inventories on hand either by observation or copying from store records. Store audits are invariably panel operations, for the derivation of sales estimates and compilation of sales trends by stores are their principal '*raison detre*'. The principal advantage of this method is that it offers the most efficient way of evaluating the effect on sales of variations of different techniques of in-store promotion.

**3. Pantry audits:** Pantry audit technique is used to estimate consumption of the basket of goods at the consumer level. In this type of audit, the investigator collects an inventory of types, quantities and prices of commodities consumed. Thus in pantry audit data are recorded from the examination of consumer's pantry. The usual objective in a pantry audit is to find out what types of consumers buy certain products and certain brands, the assumption being that the contents of the pantry accurately portray consumer's preferences. Quite often, pantry audits are supplemented by direct questioning relating to reasons and circumstances under

which particular products were purchased in an attempt to relate these factors to purchasing habits. A pantry audit may or may not be set up as a panel operation, since a single visit is often considered sufficient to yield an accurate picture of consumers' preferences. An important limitation of pantry audit approach is that, at times, it may not be possible to identify consumers' preferences from the audit data alone, particularly when promotion devices produce a marked rise in sales.

**4. Consumer panels:** An extension of the pantry audit approach on a regular basis is known as 'consumer panel', where a set of consumers are arranged to come to an understanding to maintain detailed daily records of their consumption and the same is made available to investigator on demands.

In other words, a consumer panel is essentially a sample of consumers who are interviewed repeatedly over a period of time. Mostly consumer panels are of two types viz., the transitory consumer panel and the continuing consumer panel. A *transitory consumer panel* is set up to measure the effect of a particular phenomenon. Usually such a panel is conducted on a before-and-after-basis. Initial interviews are conducted before the phenomenon takes place to record the attitude of the consumer. A second set of interviews is carried out after the phenomenon has taken place to find out the consequent changes that might have occurred in the consumer's attitude. It is a favorite tool of advertising and of social research. A *continuing consumer panel* is often set up for an indefinite period with a view to collect data on a particular aspect of consumer behavior over time, generally at periodic intervals or may be meant to serve as a general purpose panel for researchers on a variety of subjects. Such panels have been used in the area of consumer expenditure, public opinion and radio and TV listenership among others. Most of these panels operate by mail. The representativeness of the panel relative to the population and the effect of panel membership on the information obtained after the two major problems associated with the use of this method of data collection.

**5. Use of mechanical devices:** The use of mechanical devices has been widely made to collect information by way of indirect means. Eye camera, Pupilometric camera, Psychogalvanometer, Motion picture camera and Audiometer are the principal devices so far developed and commonly used by modern big business houses, mostly in the developed world for the purpose of collecting the required information.

Eye cameras are designed to record the focus of eyes of a respondent on a specific portion of a sketch or diagram or written material. Such information is useful in

designing advertising material. Pupillometric cameras record dilation of the pupil as a result of a visual stimulus. The extent of dilation shows the degree of interest aroused by the stimulus. Psychogalvanometer is used for measuring the extent of body excitement as a result of the visual stimulus. Motion picture cameras can be used to record movement of body of a buyer while deciding to buy a consumer goods from a shop or big store. Influence of packaging or the information given on the label would stimulate a buyer to perform certain physical movements which can easily be recorded by a hidden motion picture camera in the shop's four walls. Audiometers are used by some TV concerns to find out the type of programmes as well as stations preferred by people. A device is fitted in the television instrument itself to record these changes. Such data may be used to find out the market share of competing television stations.

**6. Projective techniques:** Projective techniques (or what are sometimes called as indirect interviewing techniques) for the collection of data have been developed by psychologists to use projections of respondents for inferring about underlying motives, urges, or intentions which are such that the respondent either resists to reveal them or is unable to figure out himself. In projective techniques the respondent in supplying information tends unconsciously to project his own attitudes or feelings on the subject under study. Projective techniques play an important role in motivational researches or in attitude surveys.

The use of these techniques requires intensive specialized training. In such techniques, the individual's responses to the stimulus-situation are not taken at their face value. The stimuli may arouse many different kinds of reactions. The nature of the stimuli and the way in which they are presented under these techniques do not clearly indicate the way in which the response is to be interpreted. The stimulus may be a photograph, a picture, an inkblot and so on. Responses to these stimuli are interpreted as indicating the individual's own view, his personality structure, his needs, tensions, etc. in the context of some pre-established psychological conceptualization of what the individual's responses to the stimulus mean.

**7. Depth interviews:** Depth interviews are those interviews that are designed to discover underlying motives and desires and are often used in motivational research. Such interviews are held to explore needs, desires and feelings of respondents. In other words, they aim to elicit unconscious as also other types of material relating especially to personality dynamics and motivations. As such, depth interviews require great skill on the part of the interviewer and at the same

time involve considerable time. Unless the researcher has specialized training, depth interviewing should not be attempted.

Depth interview may be projective in nature or it may be a non-projective interview. The difference lies in the nature of the questions asked. Indirect questions on seemingly irrelevant subjects provide information that can be related to the informant's behavior or attitude towards the subject under study. Thus, for instance, the informant may be asked on his frequency of air travel and he might again be asked at a later stage to narrate his opinion concerning the feelings of relatives of some other man who gets killed in an airplane accident. Reluctance to fly can then be related to replies to questions of the latter nature. If the depth interview involves questions of such type, the same may be treated as projective depth interview. But in order to be useful, depth interviews do not necessarily have to be projective in nature; even non-projective depth interviews can reveal important aspects of psycho-social situation for understanding the attitudes of people.

**8. Content-analysis:** Content-analysis consists of analyzing the contents of documentary materials such as books, magazines, newspapers and the contents of all other verbal materials which can be either spoken or printed. Content-analysis prior to 1940's was mostly quantitative analysis of documentary materials concerning certain characteristics that can be identified and counted. But since 1950's content-analysis is mostly qualitative analysis concerning the general import or message of the existing documents. "The difference is somewhat like that between a casual interview and depth interviewing."<sup>3</sup> Bernard Berelson's name is often associated with. Content-analysis is measurement through proportion.... Content analysis measures pervasiveness and that is sometimes an index of the intensity of the force."

The analysis of content is a central activity whenever one is concerned with the study of the nature of the verbal materials. A review of research in any area, for instance, involves the analysis of the contents of research articles that have been published. The analysis may be at a relatively simple level or may be a subtle one. It is at a simple level when we pursue it on the basis of certain characteristics of the document or verbal materials that can be identified and counted (such as on the basis of major scientific concepts in a book). It is at a subtle level when researcher makes a study of the attitude, say of the press towards education by feature writers.

## **COLLECTION OF SECONDARY DATA**



Secondary data means data that are already available i.e., they refer to the data which have already been collected and analyzed by someone else. When the researcher utilizes secondary data, then he has to look into various sources from where he can obtain them. In this case he is certainly not confronted with the problems that are usually associated with the collection of original data. Secondary data may either be published data or unpublished data. Usually published data are available in: (a) various publications of the central, state or local governments; (b) various publications of foreign governments or of international bodies and their subsidiary organizations; (c) technical and trade journals; (d) books, magazines and newspapers; (e) reports and publications of various associations connected with business and industry, banks, stock exchanges, etc.; (f) reports prepared by research scholars, universities, economists, etc. in different fields; and (g) public records and statistics, historical documents, and other sources of published information. The sources of unpublished data are many; they may be found in diaries, letters, unpublished biographies and autobiographies and also may be available with scholars and research workers, trade associations, labour bureaus and other public/ private individuals and organizations.

Researcher must be very careful in using secondary data. He must make a minute scrutiny because it is just possible that the secondary data may be unsuitable or may be inadequate in the context of the problem which the researcher wants to study. In this connection Dr. A.L. Bowley very aptly observes that it is never safe to take published statistics at their face value without knowing their meaning and limitations and it is always necessary to criticize arguments that can be based on them.

By way of caution, the researcher, before using secondary data, must see that they possess following characteristics:

**1. Reliability of data:** The reliability can be tested by finding out such things about the said data:

(a) Who collected the data? (b) What were the sources of data? (c) Were they collected by using proper methods (d) At what time were they collected? (e) Was there any bias of the compiler? (f) What level of accuracy was desired? Was it achieved?

**2. Suitability of data:** The data that are suitable for one enquiry may not necessarily be found suitable in another enquiry. Hence, if the available data are found to be unsuitable, they should not be used by the researcher. In this context, the researcher must very carefully scrutinize the definition of various terms and

units of collection used at the time of collecting the data from the primary source originally. Similarly, the object, scope and nature of the original enquiry must also be studied. If the researcher finds differences in these, the data will remain unsuitable for the present enquiry and should not be used.

**3. Adequacy of data:** If the level of accuracy achieved in data is found inadequate for the purpose of the present enquiry, they will be considered as inadequate and should not be used by the researcher.

The data will also be considered inadequate, if they are related to an area which may be either narrower or wider than the area of the present enquiry.

From all this we can say that it is very risky to use the already available data. The already available data should be used by the researcher only when he finds them reliable, suitable and adequate. But he should not blindly discard the use of such data if they are readily available from authentic sources and are also suitable and adequate for in that case it will not be economical to spend time and energy in field surveys for collecting information. At times, there may be wealth of usable information in the already available data which must be used by an intelligent researcher but with due precaution.

## **SELECTION OF APPROPRIATE METHOD FOR DATA COLLECTION**

Thus, there are various methods of data collection. As such the researcher must judiciously select the method/methods for his own study, keeping in view the following factors:

**1. Nature, scope and object of enquiry:** This constitutes the most important factor affecting the choice of a particular method. The method selected should be such that it suits the type of enquiry that is to be conducted by the researcher. This factor is also important in deciding whether the data already available (secondary data) are to be used or the data not yet available (primary data) are to be collected.

**2. Availability of funds:** Availability of funds for the research project determines to a large extent the method to be used for the collection of data. When funds at the disposal of the researcher are very limited, he will have to select a comparatively cheaper method which may not be as efficient and effective as some other costly method. Finance, in fact, is a big constraint in practice and the researcher has to act within this limitation.

**3. Time factor:** Availability of time has also to be taken into account in deciding a particular method of data collection. Some methods take relatively more time, whereas with others the data can be collected in a comparatively shorter duration. The time at the disposal of the researcher, thus, affects the selection of the method by which the data are to be collected.

**4. Precision required:** Precision required is yet another important factor to be considered at the time of selecting the method of collection of data.

### **GUIDELINES FOR CONSTRUCTING QUESTIONNAIRE/SCHEDULE**

The researcher must pay attention to the following points in constructing an appropriate and effective questionnaire or a schedule:

1. The researcher must keep in view the problem he is to study for it provides the starting point for developing the Questionnaire/Schedule. He must be clear about the various aspects of his research problem to be dealt with in the course of his research project.
2. Appropriate form of questions depends on the nature of information sought, the sampled respondents and the kind of analysis intended. The researcher must decide whether to use closed or open-ended question. Questions should be simple and must be constructed with a view to their forming a logical part of a well thought out tabulation plan. The units of enumeration should also be defined precisely so that they can ensure accurate and full information.
3. Rough draft of the Questionnaire/Schedule be prepared, giving due thought to the appropriate sequence of putting questions. Questionnaires or schedules previously drafted (if available) may as well be looked into at this stage.
4. Researcher must invariably re-examine, and in case of need may revise the rough draft for a better one. Technical defects must be minutely scrutinized and removed.
5. Pilot study should be undertaken for pre-testing the questionnaire. The questionnaire may be edited in the light of the results of the pilot study.
6. Questionnaire must contain simple but straight forward directions for the respondents so that they may not feel any difficulty in answering the questions.