‘Research Data’ in Social Science Methods

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Abstract

‘Research Data’ are facts, to be collected in fulfillment of the objectives of the research work. These are gathered through various means of scientific techniques and tools. They may be qualitative or quantitative or mixed form of these, depend more or less on the nature and types of research. We can get required data from primary as firsthand sources and secondary as external sources. There are various ways to collect data; the researcher can adopt the method of observation, interview, questionnaire survey, documentary and other techniques as per the research task and its limitation. Facts gathered through various sources and methods are treated as raw data. When they are refined and edited as per the requirement of research objectives, such accurate and verify data are the information to the research. Information collected from observation of measurement from within an attempt is made to develop generalization or conclusion is treated as research data. Thus, a scientific fact is a conclusion based on the best scientific data available of the moment.

Keywords: Interview, observation, primary, qualitative, quantitative, questionnaire, secondary, survey.

Objective and Methodology

This paper is constructed for the purpose of describing the data in social science research. Teachers, students and researchers in confusion over the research data may get some idea in the given

area of the study. The basic objective of this article is to discus the concept of data along with mentioning its sources, nature and method of data collection. All required materials, in meeting this objective, are collected from secondary or documentary sources of data and those are qualitative in nature.

The Concept of 'Research Data'

When the researcher has decides on a topic of research study, refines it along with establishing research questions and specified objectives, then he/she will in a position to consider how to collect the required facts for research. In this regard, the initial question is 'what does a researcher need to know any why?' rather than 'what methodology?' Now, the researcher has a question as 'what is the best way to collect required data?' When he has data, 'what shall he do with it?' The Researcher tries to get answers of his research questions or fulfill of the objectives of research study along with presentation, interpretation and analysis of information after obtaining the refined data. The word "data" is synonymously used throughout this paper to refer to "research data".

Research Data are a set of values on one or more observational units. An observational unit is the source, which gives information or observation. The information, often in the form of facts or figures, obtained from experience or surveys, used a basis for making calculations or drawing conclusions is said to be data. Data can take many forms; it may be a set of numbers, alphanumeric or strings. They may be needed to understand every phenomenon numerically, and present the information specifically and make analysis easy. They are also needed make comparison of different phenomena attractive by figures and charts, establish the mathematical relationship between the variable and observational units, and draw the inference for the

observing procedure of system. Different forms of information: primary, secondary, cross section, categorical, time series, and spatial and ordered data.

Research data mean data in the form of facts, observations, images, computer program results, recordings, measurements or experiences on which an argument, theory, test or hypothesis, or another research output is based. They may be numerical, descriptive, visual or tactile. They may be raw, cleaned or processed, and may be held in any format or media. They are distinct pieces of information, usually formatted in a special way. Strictly speaking, data are the plural of *datum*, a single piece of information. In practice, however, people use *data* as both the singular and plural form of the word. In database management systems, data files are the files that store the database information. Research data are data that are collected, observed, or created, for purposes of analysis to produce original research results. Research data can be generated for different purposes and through different processes, and can be divided into different **categories**. Each category may require a different type of data management plan (http://www.socialresearchmethods.net/kb/datatype.php).

- **Observational**: Data captured in real-time, usually irreplaceable. For example, sensor data, survey data, sample data, neurological images.
- **Experimental**: Data from lab equipment, often reproducible, but can be expensive. For example, gene sequences, chromatograms, toroid magnetic field data.
- **Simulation**: Data generated from test models where model and metadata are more important than output data. For example, climate models, economic models.

- **Derived or Compiled**: Data are reproducible but expensive. For example, text and data mining, compiled database, 3D models.
- **Reference or Canonical**: A (static or organic) conglomeration or collection of smaller (peer-reviewed) datasets, most probably published and curated. For example, gene sequence databanks, chemical structures, or spatial data portals.

Data vs. Information: Data are plain facts or unrefined information. When data are processed, organized, structured or presented in a given context so as to make them useful, they are called information. It is not enough to have data (such as statistics on the economy). Data in themselves are fairly useless. But when these data are *interpreted* and processed to determine their true *meaning*, they become useful and can be called information. They are the computer's language. Information is our translation of this language (http://www.bu.edu/datamanagement/background/whatisdata/).

'Research Data' vs 'Primary Materials'

The dividing line between 'research data' and 'primary materials' will not be clear in many cases. For example, the Australian Code for the Responsible Conduct of Research implies that completed questionnaires and recordings are 'primary materials' while transcripts derived from them are 'research data' and that different standards for retention may apply. However, it could be argued that the completed questionnaires and recordings are research data in terms of the definition adopted in this schedule. They qualify as 'factual records…used as primary sources for research', so if the research community regards them as necessary to validate research findings, then they qualify as research

data and should be retained for the recommended period. It is important to stress the importance of metadata being held in association with the research data to facilitate later interpretation and re-use. All of this together would suggest that research data, from the point of view of the institution with a responsibility for managing the data includes (http://www.ands.org.au/guides/what-is-research-data): -

- All data are created by researchers in the course of their work, and for which the institution has a curatorial responsibility for at least as long as the Code and relevant archives/record keeping acts require, and
- Third-party data, which may have originated within the institution or come from elsewhere.

Research data is not

- Administrative Data: Administrative data consist of records of payrolls, student enrolments, research assessment, and so on. Some administrative data relate to research projects and may need to be treated as research data. However, for the most part they are treated independently within the institution in terms of data management policies, procedures and strategies.
- Teaching Data: Teaching data comprise courseware and other resources, which are part of the teaching function of a university. Again, this may be of interest to a research project, but it is usually managed independently.
- Research Publications: Research publications can be

regarded as data, but for the most part they are well taken care of outside the institution, by publishers and the like. Even when held within the institution, either on open access or for research reporting purposes, they tend to be managed separately from other research data.

Gathering and Classification of the Research Data

Data are needed for meeting the study objectives and answering the questions in research. Depending upon the research strategy selected, they may be gathered by such activities as (McNbb, 2005: 73): 1) participating in a social situation and recording the findings, 2) overtly or covertly observing the behavior of subjects, 3) interviewing subjects one at a time or in group, 4) administering a questionnaire to survey the attitudes of a sample of voters, 5) or reviewing documents of other information sources, among others.

It is a universally acknowledged fact that researchers are interested in data of all kinds, regardless of origin or type. This presents a challenge to the institution developing policies around the management of research data, both digital and non-digital. What should be included? Can anything be excluded? There are recognised definitions of research data available. For example, they can be found in the research data management policies of a number of Australian universities. According to the Queensland University of Technology research data mean data in the form of facts, observations, images, computer program results, recordings, measurements or experiences on which an argument, theory, test or hypothesis, or another research output is based. Data may be numerical, descriptive, visual or tactile. They may be raw, cleaned or processed, and may be held in any format or media. Likewise, the University of Melbourne states

research Data are facts, observations or experiences on which an argument, theory or test is based. Data may be numerical, descriptive or visual. Data may be raw or analysed, experimental or observational. Data include laboratory notebooks, field notebooks, primary research data (including research data in hardcopy or in computer readable form), questionnaires, audiotapes, videotapes, models, photographs, films, and test responses. Research collections may include slides, artifacts, specimens and samples. Provenance information about the data might also be included: the how, when, where it was collected and with what (for example, instrument). The software code used to generate, annotate or analyse the data may also be included. The University of Melbourne makes no functional distinction between physical research products, digital research data and records of research, which can include items such as correspondence, application documents, reports and consent forms. The Monas University also provides the meaning of Research Data as data can gather through records, files or other evidence, irrespective of their content or form (e.g. in print, digital, physical or other forms), that comprise research observations, findings or outcomes, including primary materials and analysed data. Likewise, Griffith University defines research data as the primary materials as factual records, which may take the form of numbers, symbols, text, images or sounds, used as primary sources for research, and that are commonly accepted in the research community as necessary to validate research findings (http://www.ands.org.au/guides/what-is-research-data; http://www.socialresearchmethods.net/kb/datatype.php).

Classification of Research Data

David McNbb has given the following list as the classification of sources of data and methods of data collection (McNabb,

2005: 74);

I. Positivist Research Data Sources

A. Primary Data Sources

1. Field Survey
    a. Questionnaires
    b. Attitude surveys
    c. Lifestyle surveys
2. Field Studies
    a. Observation studies
    b. Personal interviews
    c. Focus group interviews
    d. Videotaping and audio recording
3. Experiments
    a. Laboratory experiments
    b. Field experiments

B. Secondary Data Sources

a. Organization infernal reports
b. Organization invoice and/or accounts payable records
c. Registered voter lists
d. Vote records
e. Production and service records
f. Human resource records

II. Post positive Research Data Sources

A. Existing Documents

a. Books, periodicals, published reports, films, unpublished literature
b. Local, state, and federal government

documents

c. Professional association papers and reports
d. College and university documents
e. Consultants' research reports
f. Meeting minutes
g. Commercial databases
h. Other

B. Internal Records

a. E-mail
b. Memoranda
c. Policy papers
d. Reports and other documents

C. External Sources

a. Interviews
b. Life histories
c. Case studies
d. Observation and participant observation.

Sources of Data: Primary and Secondary

The researcher himself/herself or through agents, especially to answer research questions, collect primary data. Studies made by others for their own purpose represent secondary data to you. Primary and secondary sources have strength and weakness. Using primary sources, researchers can collect precisely the information they want. They usually can specify the operational definitions used and can eliminate, or at least monitor and record the extraneous influences on the data as they are gathered. However, secondary sources are indispensable in other ways. There is nothing wrong with using primary data under many circumstances or secondary data under different circumstances, or rarely and prudently, substituting one for the other when either

might be suitable. But the basis for substitution has to be well-understood and good judgment applied (Cooper and Pamela, 1998: 256).

Primary data are original facts collected for the first time for the fulfillment of the objectives. They are called as internal source of data as the data are collected directly from the respondents/ fields of the study. They are obtained from living persons directly related to the problem and objectives of the research study. These primary data can be divided into two sub-divisions as direct primary and indirect primary data (Myneni, 2014). If the researcher personally goes and observe events, things, behaviour, activities or phenomena in the research field then this type of data collection is called direct primary sources. It is the best method but it needs great skill and objectivity. Likewise, if the researcher cannot observe things, which occurred long back for collecting the information he/she needs to contact those who have made observations relevant to his research study, then this type of data collection is called indirect primary sources.

Secondary or external source of data are related to that information which are obtained from outside as either public source or someone else, who have already worked or encountered on the subject. This type of data can help to save time, money and energy. But a researcher should verify these data with the help of other sources. This type of source can be obtained in the form of published and unpublished documents, and public and private documents (Myneni, 2014). Political scientists rely heavily on data that exist in various archival records. In this type of data collection, known as document analysis researchers rely on the record-keeping activities of government agencies, private institution, interest groups, media organization, and even

private citizens. (Johnson and Joslyn, 1998: 157-58). However, these primary and secondary data are not opposite but they have close relationship as supplement the evidence to each other. The primary data collected by researcher himself will be secondary data for others. The researcher collecting primary data knows the reality and the limitations of the problem. Second hand data provide outlook and useful supplementary information for the primary source. It helps to establish the hypotheses for the problem and those hypothesis can be tested verified on the basis of the first hand data.

Nature/Types of Data: Qualitative and Quantitative

The term "qualitative research" is used to describe a set of nonstatistical inquiry techniques and processes used to gather data about social phenomena. Qualitative data refer to some collection of word, symbols, pictures, or other nonnumeric records, material, or artifacts that are collected by a researcher and are data that have relevance to the social group under study. The uses for these data go beyond simple description of events and phenomena; rather, they are used for creating understanding, for subjective interpretation, and for critical analysis as well (McNbb, 2005: 341). Qualitative data are data that have been gathered during the conduct interpretive or "post-positive" research studies. They exist most often as some sort of narrative. Thus, they can be written text, transcript of conversations or interviews, transcripts or therapeutic or consultative interviews, records of legal trials or transcripts of focus group discussions. They can exist as historical or literary documents, ethnographic fields notes, and newspapers, clippings, or magazines, journal articles and other non-quantitative source (McNbb, 2005: 433-44). Most of the time, however, qualitative research data exist

as collections of rough field notes that need note transcribed while presenting and interpreting such data. Therefore, they are suggested that qualitative data exist as "the essences of people, objects, and situations" (Miles and Huberman, 1998: 182).

Quantitative research data refer that the type of approach where the data have the numerical values, as data are laden with numbers, figures and percentage scale of measurement. These types of research data are used to cover the large field study areas and to make them more reliable and validity. Social reality and human behavior could be transcribed through statistical interpretation in such quantitative research data. Thus, the quantitative method of research data is also called the statistical method of research data. The terms 'measurement' and 'data' will often be used interchangeably to refer to the same or similar idea, the numbers that are used to signify variable measurement. Variables are things that can be counted or measured. Different values of variables can convey different meanings. Helping to establish this meaning is the nature of the measurement of data. Measurements all belong to one of four classes. The four different types or levels of measurement found in the political science researches. They are: 1) nominal, b) ordinal, 3) interval and 4) ratio. Statisticians have developed different statistical tests that used to analyze data of each different type (data types are also referred to as scales or measurement) (McNbb, 2005: 114). As a positive philosophy of such research approach, social reality and human behavior can be studied objectively with numerical and statistical analysis. Hence, quantitate research studies the human behaviors through scientific observation, measurement and interpretation. However, quantitative research data are based on the positive philosophy of investigation.

We can draw differences in between qualitative research data

and quantitative research data in several fundamental ways. For example, Thomas Lee says that qualitative research studies typically involve what has been described as "inductive, theory-generating, subjective, and no positivist processes." In contrast, the quantitative research involves "deduction, theory-testing, objective, and positivist processes" (Lee, 1999: 10). Likewise, John W. Creswell (1994) identified five ways as these two approaches differ, based upon these five philosophical foundations: ontology (researchers' perception of reality), epistemology (the role or roles taken by researches), and methodological approaches (approaches taken by researchers). The differences identified by Creswell are displayed as follow;

Five Ways Qualitative Research differs from Quantitative Research

Philosophical foundation	Qualitative Research Design	Quantitative Research Designs.
ONTOLOGY (Perception of Reality)	Researchers assume that multiple, subjectively derived realities can coexist.	Researchers assume that a single, objective world exists.
EPISTEMOLOGY (Roles for the Researcher)	Researchers commonly assume that they must interact with their studies phenomena.	Researchers assume that they are independent from the variable under study.
AXILOGY (Researchers' values)	Researchers overtly act in a value-laden and biased fashion.	Researchers overtly act in a value-free and unbiased manner.
RHETORIC (Language Styles)	Researchers often use personalized, informal, and context-laden language.	Researchers most often use impersonal, formal, and rule-based text.
METHODOLOGY (Approaches to Research)	Researchers tend to apply induction, multiprocess interactions, following context-laden methods.	Researchers tend to apply deduction, limited cause-and-effect relationships, with context-free methods.

Source: Creswell, 1994/Cited in McNbb, 2005: 342.

In most physical and biological sciences, the use of either quantitative or qualitative methods is uncontroversial, and each is used when appropriate. In social sciences, particularly in sociology, social anthropology and psychology, the use of one or other type of method can be a matter of controversy and even ideology, with particular schools of thought within each discipline favoring one type of method and pouring scorn on to the other. The majority tendency throughout the history of social science, however, is to use eclectic approaches by combining both methods. Qualitative methods might be used to understand the meaning of the conclusions produced by quantitative methods. Using quantitative methods, it is possible to give precise and testable expression to qualitative ideas. This combination of quantitative and qualitative data gathering is often referred to as mixed-methods research.

In social science, quantitative data relate to empirical methods, originating in both philosophical positivism and the history of statistics, which contrast with qualitative research methods. Qualitative research produces information only on the particular cases studied, and any more general conclusions are only hypotheses. Quantitative methods can be used to verify which of such hypotheses are true. Qualitative and quantitative aspects of scientific investigation, it has been argued, go hand in hand. For example, based on analysis of the history of science, Kuhn concludes, "large amounts of qualitative work have usually been prerequisite to fruitful quantification in the physical sciences". Qualitative research is often used to gain a general sense of phenomena and to form theories that can be tested using further quantitative research. For instance, in social science qualitative research methods are often used to gain better understanding of such things as intentionality (from the speech response of the researcher) and meaning (why did this person/group say

something and what did it mean to them? (Kieron Yeoman). Although quantitative investigation of the world has existed since people first began to record events or objects that had been counted, the modern idea of quantitative processes have their roots in Auguste Comte's positivist framework. Positivism emphasized the use of the scientific method through observation to empirically test hypotheses explaining and predicting what, where, why, how, and when phenomena occurred. Positivist scholars like Comte believed only scientific methods rather than previous spiritual explanations for human behavior could advance. (http://www.ands.org.au/guides/what-is-research-data http://www.socialresearchmethods.net/kb/datatype.php).

No approach depends solely on one method any more than it would exclude a method, merely because, it is labeled 'questionnaire', qualitative', case study', action research or whatsoever. Researchers may consider that a study making use of a question will inevitably be quantitative but it may also have qualitative features. Case studies, which are generally considered to be qualitative studies, can combine a wide range of methods, including quantitative techniques. Methods are selected because they will provide the data researchers require producing a complete piece of research. Decisions have to be made about which methods are best for particular purposes and then data collecting instruments must be designed to do the job (Bell, 2010: 101)

It can be used when researchers want to build from one phase of research to another. They may first want to explore the data qualitatively to identify help in the development an instrument or to identify concepts/variables to test in a later quantitative study or phase of a single study. Therefore, researchers engage in a mixed method study when they want to construct a quantitatively

driven design, a qualitatively driven design, or an interactive/ equal-status design. Each of these comes with advantages and disadvantages. For more information on designing multiple and mixed methods research studies see the following design or literature: Brewer & Hunter (2006); Creswell & Plano Clark (2011); Greene (2007).

Methods/Tools of Data Collection

There are lots of tools or methods for data collection. Such as observation, survey, questionnaire, interview, focus group discussion, life history, case study, documentary, library methods, and so on. The researcher can adopt one or more methods of data collection as it depends on the requirement of the objectives and nature of the research. For example, if we conduct ethnographic research then we have to adopt one or more data gathering tools of participant observation, informal interviewing, case studies, and collecting life histories (Ellen, 1984). For selecting the data collection tools are not only as guided by the nature of the research. Hence, knowledge and skills of the researcher, investment of the time and fund, purposes of the research as well as viability, reliability, and validity are such factors which more or less determine to identify the types of data collection method. Some major tools of data collection with brief introduction are given below:

Survey Method

The literal meaning of survey is to see over something from a high place. The term is used to technique of investigation by direct observation of a phenomena or collection of data. In the social science research, survey is more popular through

which quantitative facts are collected about the social aspect of a community's composition, activities and its perceptions. The survey research is interested in the accurate assessment of the characteristics of whole populations of people or samples of them. Only rarely, however, do survey researchers study whole population, therefore, they study sample drawn from populations. From these samples they infer the characteristics and perceptions of the defined population or universe. Sample surveys attempt to determine the incident, distribution, and interrelations among sociological and psychological variables. Although the approach and the method of survey research can be used on any set of objects that can be well defined by social science researchers, survey research focuses on people, their vital facts, and their beliefs, opinion, attitudes, motivations and behavior (Kerlinger, 1984). Social scientists look upon survey as a way and a supreme useful one of exploring the field of collecting data around as well as directly on the subject of study. This type of data collection is sued to collect data when a wide geographical area has to be covered and when they are covered with large or widely spread out groups of people. Survey can be classified with personal interview, mail questionnaire, questionnaire schedule, panel, telephone, people opinion and controlled observation. Amongst these, "the personal interview far overshadows the others as perhaps the most powerful and useful data tool of social scientific survey research" (Kerlinger, 1984: 412).

Observation Method

Science begins with observation and must ultimately return to observation for its final validation. Observation is one of the most importance and as usual method in the social science research. It is one of the primary research instruments, which is both most

primitive, and the most modern method of study. According to P V Young, observation may be defined as systematic viewing, coupled with consideration of the seen phenomenon (Young, 1992). Observation is a popular method that employ, vision as its main means of data collection. It implies the use of eyes rather than of ears and voice. It is accurate watching and nothing of phenomena as they occur with regard to the cause and effect or mutual relations. It is watching behavior of other persons as it actually happens without controlling it. Basically, there are two modes of observation: we can watch people do and say things and we can ask people about their own actions and the behavior of others. The principal ways of getting information are by either experiencing something directly, or by having someone tell us what happened Kerlinger, 1983: 537). However, there are three elements of observation namely, sensation, attention and perception. Observation can classified as participant and non-participant observation, uncontrolled and controlled observation, structured and instructed observation, simple ad systematic observation and intra-subjective and inter-subjective observation.

Questionnaires Method

It is quite popular method to collect data from large, diverse, varied and scattered respondents settled in different places. Questionnaire is a list of questions to be answered by a group of people, especially to get facts or information about their views (Myneni, 2014: 217). It is a device of data collection for securing answers to questions by using a form, which the respondent fills in himself (Goode and Hatt, 1985). A list of questions sent to a number of persons for their answers and which obtains standardized results that can be tabulated and treated statistically, is a questionnaire. This tool is used most of

the large research project. The list of various questions depend on objectives of research should maintain in definite order in order to sent the respondents for seeking their answers. This method is economic and effective because it covers to the population that may widely and thinly spread in large territory. Due to absent of researcher the respondent can fill-up the questionnaire freely and independently. Therefore, it is supposed that it minimizes bias and maximizes the evidence collection. But the questionnaires cannot elicit replies from people who are illiterate and less educated. Questionnaire can be classified as open-ended, close-ended, dichotomous, matrix, leading and multiple choice or cafeteria questionnaires.

Interview Method

Interview is the oldest and most often used device for obtaining data. It is a verbal method of securing data. It is conversation among and between human beings. It may be conducted face-to-face or over the telephone or through the Internet process. This method can be used both for the illiterate and educated respondents. Interview is a systematic method by which a person enters more or less imaginatively into the life of a competitive stranger (Young, 1992). It may involve face-to-face interviews or interviews conducted over the phone or through the mail. It may involve highly structured interviews in which a questionnaire is closely followed or less structured, open-ended discussion. The data come form responses to verbal or written cues of the researchers and the respondent knows this response one being recorded (Johnson and Joslyn, 1998: 157). However, interview is a purposive conversation between the researcher/s and the respondent/s. The purpose may vary widely in order to include the necessary data. Interview is classified through various grounds, i.e. formalness, methodology, purpose,

subject matter, number, period of contact, and functions. There are two broad types of interview: "structured and unstructured or standardized and unstandardized" (Kerlinger, 1984: 481). If the questions, their sequence, and their wording are fixed, it is structured or standardized interview. In this interview uses interview schedules that have been carefully prepared to obtain research data pertinent to the research objectives. Whereas, in the unstructured or unstandardized interview the content, sequence, and wording are not fixed, these are entirely handled skillfully by the interviewers.

Interview Schedule is used as tools to elicit information in structured interviews. The schedule is the form containing some questions of blank tables, which are to be filled by the interviewer after getting answers from the respondents. It is nothing more than a set of questions, which are asked and filled in by the interviewer in a face-to-face situation with another person. According to M. Parten, "three kinds of information are included in most schedules: face sheet (identification) information, census-type (or sociological) information, and problem information" (cited in Kerlinger, 1984: 482). However, the aims of the schedule are to determine the topic, to act as memory ticker and to help in the classification and analysis of data.

Conclusion

A set of facts related to the given phenomena in research is called research data. It may be raw and unrefined in terms of not excluded the unnecessary knowledge, that's way every data should be edited and verified in due process and procedure of scientific ways. When refined and edited the raw data as per the research objectives, then it is supposed as information. Data are very essential to get answers and to meet the objectives in

research. In every research, data are supposed to be at the heart, without it research could not accomplish its task. Research work or study means to identify the data, collect them and accomplish in your presentation and analysis. That is the due process; researchers should follow scientific methods of data collection and process for getting conclusion with accomplishes the objectives of their research. What type of data and from which source will be viable, depends on the nature and necessity of research study. Like, in anthropological research, researchers may adopt the qualitative research and can obtain data from observation or interview methods, whereas in sociology, researchers may focus on the quantitative data from primary sources with using the questionnaires survey. So far political science, most of the researches are mixed methods as qualitative and quantitative in nature along with gathered data from both, primary and secondary sources. However, it has been adopted as mixed form of research data, qualitative and quantitative, in various disciplines of social sciences of contemporary researches.

Primary data are original data, which the researchers collect from firsthand sources. Observation, questionnaires, survey and interview are amongst the usual methods or tools to collect the primary sources of data. If the researchers use or gather those data or facts that have been collected else for another purpose, are regarded as the secondary sources of data. Secondary sources of data may be available in government or private sectors as published or unpublished records, reports, journals or books, or other forms of materials. Neither a single type/source of data is inherently better than the other type/source. Nevertheless, in comparison to primary data, secondary data are easy to get in view of time and cost, but care always be taken for its use and interpretation to ensure that it needs the specific research objectives.

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