Data Collection In Research: Concept, Process And Methods

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ABSTRACT

Data collecting tools" refers to the tools/devices used to gather data, such as a paper questionnaire or a system for computer-assisted interviews. Tools used to gather data include case studies, checklists, interviews, occasionally observation, surveys, and questionnaires. Before conducting research,in any field, researcher must understand the different basic concepts used in the Research Methodology.In this presentation, objectives, Need, Significance, Assumption & Hypothesis, these five concepts are considered.Interviews are a direct method of data collection. It is simply a process in which the interviewer asks questions and the interviewee responds to them. It provides a high degree of flexibility because questions can be adjusted and changed anytime according to the situation.

Key Words : Backdrop, Process, Importance,Methods and Challenges

Backdrop

Research is the cornerstone of any science, including both the hard sciences such as chemistry and physics and the social (or soft) sciences such as psychology, management, or education. It refers to the organized, structured, and purposeful attempt to gain knowledge about a suspected relationship. Research comprises "creative and systematic work undertaken to increase the stock of knowledge, including knowledge of humans, culture and society, and the use of this stock of knowledge to devise new applications."[1]

The word *research* is derived from the Middle French "*recherche*", which means "to go about seeking", the term itself being derived from the Old French term "*recerchier*" a compound word from "re-" + "cerchier", or "sercher", meaning 'search'[2] The earliest recorded use of the term was in 1577. Research objectives are the outcomes that you aim to achieve by conducting research. Many research projects contain more than one research objective. Creating strong research objectives can help your organization achieve its overall goals.

data collection is a process of gathering information from all the relevant sources to find a solution to the research problem. It helps to evaluate the outcome of the problem. The data collection methods allow a person to conclude an answer to the relevant question. Data collection can help improve services, understand consumer needs, refine business strategies, grow and retain customers, and even sell the data as second-party data to other businesses at a profit.

Steps in the Data Collection Process

In the Data Collection Process, there are 5 key steps. They are explained briefly below -

1. Decide What Data You Want to Gather

The first thing that we need to do is decide what information we want to gather. We must choose the subjects the data will cover, the sources we will use to gather it, and the quantity of information that we would require. For instance, we may choose to gather information on the categories of products that an average e-commerce website visitor between the ages of 30 and 45 most frequently searches for.

2. Establish a Deadline for Data Collection

The process of creating a strategy for data collection can now begin. We should set a deadline for our data collection at the outset of our planning phase. Some forms of data we might want to continuously collect. We might want to build up a technique for tracking transactional data and website visitor statistics over the long term, for instance. However, we will track the data throughout a certain time frame if we are tracking it for a particular campaign. In these situations, we will have a schedule for when we will begin and finish gathering data.

3. Select a Data Collection Approach

We will select the data collection technique that will serve as the foundation of our data gathering plan at this stage. We must take into account the type of information that we wish to gather, the time period during which we will receive it, and the other factors we decide on to choose the best gathering strategy.

4. Gather Information

Once our plan is complete, we can put our data collection plan into action and begin gathering data. In our DMP, we can store and arrange our data. We need to be careful to follow our plan and keep an eye on how it's doing. Especially if we are collecting data regularly, setting up a timetable for when we will be checking in on how our data gathering is going may be helpful. As circumstances alter and we learn new details, we might need to amend our plan.

5. Examine the Information and Apply Your Findings

It's time to examine our data and arrange our findings after we have gathered all of our information. The analysis stage is essential because it transforms unprocessed data into insightful knowledge that can be applied to better our marketing plans, goods, and business judgments. The analytics tools included in our DMP can be used to assist with this phase. We can put the discoveries to use to enhance our business once we have discovered the patterns and insights in our data.

Importance of Data Collection

Data collection is important in various domains because it provides valuable insights and supports decision-making. It helps understand trends, patterns, and relationships.

-Informed decision-making: Data collection provides valuable information that helps individuals and organizations make informed decisions.

-Problem identification and solution: We can identify and understand problems more accurately, ensuring effective problem-solving.

-Effective planning and policy development: It helps gather insights and understand trends, enabling entities to develop policies that address specific needs and challenges.

-Progress monitoring: Researchers can track progress, measure performance, and identify areas for improvement, ensuring goals are met effectively.

-Research and innovation: Data collection forms the foundation for research and innovation, driving discoveries and promoting advancements in various fields.

-Evidence-based decision-making: It provides empirical evidence, enabling individuals and organizations to base their decisions on facts instead of subjective opinions or assumptions.

Data Collection Methods

Data collection is the process of collecting and evaluating information or data from multiple sources to find answers to research problems, answer questions, evaluate outcomes, and forecast trends and probabilities. It is an essential phase in all types of research, analysis, and decision-making, including that done in the social sciences, business, and healthcare.

Selection of the right Data Collection technique(s) is one of the key factors deciding the methodological rationale of the research and subsequent analysis. Each of the individual techniques used to obtain data is linked to specific analysis and interpretation processes. Not every technique can be used to transpose the results obtained directly onto the pool of research subjects. A research technique and, subsequently, the research sample, should be defined with the research objectives firmly in mind.

It is increasingly common for researchers and academics to combine multiple techniques within a single research project (Mixed-Mode Data Collection). This approach helps to reduce mistakes and inconsistencies that can arise due to the sample's structure, population coverage and absence of responses. Some of these techniques discussed here.

1. Interviews

Interviews are a guided conversation where one person seeks information from the other. Interviews are usually carried out in person i.e. face-to-face but can also be administered by telephone or using more advance computer technology such as Skype, video call. Sometimes they are held in the interviewee's home, sometimes at a more neutral place.

The interviewer (which is not necessarily the researcher) could adopt a formal or informal approach, either letting the interviewee speak freely about a particular issue or asking specific pre-determined questions. A semi-structured approach would enable the interviewee to speak relatively freely, at the same time allowing the researcher to ensure that certain issues were covered.

When conducting the interview, the researcher might have a check list or a form to record answers. This might even take the form of a questionnaire. It is difficult to pay attention to the non-verbal aspects of communication and to remember everything that was said and the way it was said. Consequently, it can be helpful for the researchers to have some kind of additional record of the interview such as an audio or video recording. They should of course obtain permission before recording an interview.

2. Surveys

A survey consists of obtaining information from a respondent on the basis of a pre-prepared questionnaire. Surveys involve collecting information, usually from fairly large groups of people, by means of questionnaires but other techniques such as interviews or telephoning may also be used. There are different types of survey. The most straightforward type (the "one shot survey") is administered to a sample of people at a set point in time. Another type is the "before and after survey" which people complete before a major event or experience and then again afterwards.

3. Questionnaires

Questionnaires are a good way to obtain information from a large number of people and/or people who may not have the time to attend an interview or take part in experiments. They enable people to take their time, think about it and come back to the questionnaire later. Questionnaires fall into the following categories: paper-based, online and auditorium questionnaires. The latter involve respondents being gathered in a single room and completing their questionnaires, following which the completed questionnaires are pooled. Three types of questions can be asked in questionnaires: open-ended, semi-open-ended and closed-ended questions.

The drawback for researchers is that they usually have a fairly low response rate and people do not always answer all the questions and/or do not answer them correctly. Questionnaires can be administered in a number of different ways (e.g. sent by post or as email attachments, posted on Internet sites, handed out personally or administered to captive audience (such as people attending conferences).

4 .Observation

The observation method is the most commonly used technique in studies relating to behavioural sciences. 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.

Studies which involve observing people can be divided into two main categories, namely participant observation and non-participant observation.

In participant observation studies, the researcher becomes (or is already) part of the group to be observed. This involves fitting in, gaining the trust of members of the group and at the same time remaining sufficiently detached as to be able to carry out the observation. The observations made might be based on what people do, the explanations they give for what they do, the roles they have, relationships amongst them and features of the situation in which they find themselves.

In non-participant observation studies, the researcher is not part of the group being studied. The researcher decides in advance precisely what kind of behaviour is relevant to the study and can be realistically and ethically observed. The observation can be carried out in a few different ways. For example, it could be continuous over a set period of time (e.g. one hour) or regularly for shorter periods of time (for 60 seconds every so often) or on a random basis

5. Case studies

Case studies have a very narrow focus which results in detailed descriptive data which is unique to the case(s) studied. Case studies usually involve the detailed study of a particular case (a person or small group). Various methods of data collection and analysis are used but this typically includes observation and interviews and may involve consulting other people and personal or public records. The researchers may be interested in a particular phenomenon (e.g. coping with a diagnosis or a move into residential care) and select one or more individuals in the respective situation on whom to base their case study/studies. Case studies have a very narrow focus which results in detailed descriptive data which is unique to the case(s) studied.

6. Test

Central location tests are most commonly used in tests of new or modified products or advertising materials. Their unique advantage is that they provide an environment in which certain features of the product, such as flavour, fragrance or appearance, can be tested in standardised conditions. The tests are conducted in purpose-built studios in city-centre locations and are attended by test participants selected according to pre-defined criteria. There are so any types of tests are conducted. For e.g. Concept tests, Product tests, Price tests, Cosmetic tests, Flavour tests, tests of household chemicals, Advertising concept tests, Fragrance tests.

7. Game storming

Game storming, as the name suggests, refers to the use of games for brainstorming. The term Innovation Games also refers to this technique. Presenting the problem in a game format suspends some of the normal protocols of life and frees the participants to think creatively to solve problems. For example, if the goal is to prioritize a list of features in a product, game storming may involve giving each participants a limited set of resources and allowing them to buy / bet on features to see which ones come out on top.

8. Diary studies

A diary study involves asking the test participants to record and report their experiences related to a particular subject over a period of time. Depending on the type of study, participants may use paper diaries, emails, twitter or a combination. Such studies can be flexible and easy to execute. They are particularly appropriate for understanding mobile device usage since it allows the user to provide their input on-the-go.

Like most research methods, diary studies need to be well designed and have a focus to be effective. A poorly designed study may yield a lot of data that may be difficult to create some sense.

9. Site visit / Field research

This refers to research conducted outside a traditional lab setting, in a user's natural work environment. It involves visiting the site where the product is used and observing the usage in action. It can reveal interesting insights on environmental circumstances affecting the usage of the product, and supplementary tools and work-around used along with the product.

10. Brainstorming

Brainstorming is a tool for creative problem solving, wherein a group of people come together to contribute ideas spontaneously. It is particularly useful when you want to break out of stale, established patterns of

thinking, so that you can develop new ways of looking at things. When a interdisciplinary product team brainstorms to come to a common vision of the solution, it helps get buy-in for the chosen solution.

11. Desk Research

Desk research comprises searching for information using existing resources, such as the press, the Internet, analytical reports and statistical publications. This is then followed by cross referencing and the collation of data.Desk research (or secondary research) can serve as a stand-alone research technique or as the initial stage of a project and a precursor to primary research.

12. Mystery Shopper/ Caller

The mystery shopper or caller research technique is most commonly used when assessing staff behaviour toward customers, examining consumer behaviour in real-life conditions and evaluating the environment in which specific products are sold.

Mystery shopping is used to assess the quality of service provided by stores and customer service points. The person playing the part of the mystery shopper performs pre-determined tasks, such as enquiring about a particular service or offering, buying a product or filing a complaint. Throughout the process, the mystery shopper observes the behaviour of the attending employee and, upon leaving the sales environment, records his or her observations on a specially prepared form.This technique can also be used to review the quality of customer service provided over the telephone.

13. A/B Testing

A/B testing is an experimental approach to user experience design. It presents two versions of a website (Option A and Option B) to the user, and analyzes users' behavior. Typically, it tries to track the effect of the differences of the two options against a desired goal. For example, if a website is trying to increase click through rate, they may present a version to one set of online users, and a different version to another. They could analyze if these differences have any impact on the metric they care about.

Challenges to Collecting Data

While it's crucial to know 'what is data collection, it's equally important to have a grasp of the challenges involved in the process.

1. Data Bias

There is a possibility of bias during data collection, which leads to biased data analysis. Ensuring inclusivity during the collection and revision phases and crowdsourcing can help overcome data bias.

2. Data Protection and Legal Issues

To avoid legal entanglements, it is essential to maintain integrity and transparency in the data collection process.

3. Underestimating Costs

Data collection can be expensive and companies sometimes underestimate the costs involved. Thus, accounting for every expense associated with each data point is vital.

Conclusion

Data-collection instruments" means tests, questionnaires, inventories, interview schedules or guides, rating scales, and survey plans or any other forms which are used to collect information on substantially identical items from 10 or more respondents. Good data provides indisputable evidence, while anecdotal evidence, assumptions, or abstract observation might lead to wasted resources due to taking action based on an incorrect conclusion. Data collection companies and field services companies are leading market research firms that specialize in collecting observations for marketing research studies. Research data is any information that has been collected, observed, generated or created to validate original research findings. Research data may be arranged or formatted in a such a way as to make it suitable for communication, interpretation and processing. Data comes in many formats, both digital and physical

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