RESEARCH PROCESS

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FORMULATING THE RESEARCH PROBLEM

The researcher must single out the problem he wants to study, i.e., he must decide the general area of interest or aspect of a subject matter that he would like to inquire into. Initially, the problem may be stated in a broad general way and then the ambiguities, if any, relating to the problem be resolved. The best way of understanding the problem is to discuss it with one’s own colleagues or those having some expertise in the matter.

EXTENSIVE LITERATURE SURVEY

Once the problem is formulated, a brief summary of it should be written down. At this juncture the researcher should undertake extensive literature survey connected with the problem. For this purpose, the abstracting and indexing journals and published or unpublished bibliographies are the first place to go to. Academic journals, conference proceedings, government reports, books etc., must be tapped depending on the nature of the problem. In this process, it should be remembered that one source will lead to another. A good library will be of a great help to the researcher at this stage. In this era of internet, it has become quite easy to search the articles.

DEVELOPMENT OF WORKING HYPOTHESIS

After extensive literature survey, researcher should state in clear terms the working hypothesis.

- Discussions with colleagues and experts about the problem, its origin and the objectives in seeking a solution;
- Examination of data and records, if available, concerning the problem for possible trends, peculiarities and other clues;
- Review of similar studies in the area or of the studies on similar problems; and
- Exploratory personal investigation which involves original field interviews on a limited scale with interested parties and individuals with a view to secure greater insight into the practical aspects of the problem.

PREPARING THE RESEARCH DESIGN

The research design problem having been formulated in clear terms, the researcher will be required to prepare a research design, i.e., he will have to state the conceptual structure within which research would be conducted. The preparation to such a design facilitates research to be as efficient as possible yielding maximal information. Researcher purposes may be grouped into four categories, viz.,

- Exploration
- Description
- Diagnosis, and
- Experimentation

DETERMINING SAMPLE DESIGN

All the items under consideration in any field of inquiry constitute a ‘universe’ or “population’. A complete enumeration of all the items in the ‘population’ is known as census inquiry. It can be presumed that in such an inquiry when all the items are covered, no element of chance is left and highest accuracy is obtained. But in practice this may not be true. For instance, blood testing is done only on sample basis. Hence, quite often we select only a few items from the universe for our study purposes. The items is selected constitute what is technically called a sample.

THE BRIEF MENTION OF THE IMPORTANT SAMPLE DESIGN IS AS FOLLOWS:

- **Deliberate sampling:** It is also known as purposive or non-probability sampling. This sampling method involves deliberate selection of particular units of the universe for constituting a sample which represents the universe. When population elements are selected for inclusion in the sample which represents the universe.
- **Simple random sampling:** This type of sampling is also known as chance sampling or probability sampling where each and every item in the population has an. Equal chance of inclusion in the smoke and each one of the possible samples, in case of finite universe, has the same probability of being selected.
- **Systematic sampling:** In some instances the most practical way of sampling is tp select every 15th name on. List, every 10th house on one side of street and so on. Sampling of this type is known as systematic sampling.
- **Stratified sampling:** If the population from which a sample is to be drawn does not constitute a homogeneous group, then stratified sampling technique is applied so as to obtain a representative sample. In this technique, the population is stratified into a number of non overlapping subpopulations or strata and sample items are selected from each stratum.

- **Quota sampling:** In stratified sampling the cost of taking random samples from individual strata is often so expensive that interviewers are simply given quota to be filled from different strata, the actual selection of items for sample being left to the interviewer's judgement.
- **Cluster sampling and area sampling:** Cluster sampling involves grouping the population and then selecting the groups or the clusters rather than individual elements for inclusion in the sample.
- **Multi-stage sampling:** This is a further development of the idea of cluster sampling. This technique is meant for big inquires extending to a considerably large geographical area like an entire country. Under multi-stage sampling the first stage may be to select large primary sampling units such as states, then districts, then towns and finally certain families within towns.
- **Sequential sampling:** This is somewhat a complex sample design where the ultimate size of the sample is not fixed in advance but is determined according to mathematical decisions on the basis of information yielded as survey progresses. This design is usually adopted under acceptance sampling plan in the context of statistical quality control.

COLLECTING THE DATA

In dealing with any real life problem it is often found that data at hand is inadequate, and hence, it becomes necessary to collect data that is appropriate.

- **By observation:** This method implies the collection of information by way of investigator's own observation, without interviewing the respondents. The information obtained related to what is currently happening and is not complicated by either the past behaviour or future intentions or attitudes of respondents.
- **Through personal interview:** The investigator follows a rigid procedure and seeks answers to a set of preconceived questions through personal interviews.
- **Through telephone interviews:** This method of collecting information involves contacting the respondents on telephone itself.
- **By mailing of questionnaires:** The researcher and the respondents do come in contact with each other if this method of survey is adopted. Questionnaires are mailed to the respondents with a request to return after completing the same.
- **Through schedules:** Under this method the enumerators are appointed and given training. They are provided with the schedules containing relevant questions.

EXECUTION OF THE PROJECT

Execution of the project is a very important step in the research process. If the execution of the project proceeds on correct lines, the data to be collected would be adequate and dependable. The researcher should see that the project is executed a systematic manner and or time. If the survey is to be conducted by means of structured questionnaires, data can be readily machine processed. In such a situation, questions as well as the possible answers may be coded. If the data is to be collected through interviewers, arrangements should be made for proper selection and training of the interviewers.

ANALYSIS OF DATA

After the data has been collected, the researcher turns to the task of analysis them. The analysis of data requires a number of closely related operations such as establishment of categories, the application of these categories to raw data through coding, tabulation and then drawing statistical inferences.

Analysis work after tabulation is generally based on the computation of various percentages, coefficients, etc., by applying various well defined statistical formulae.

In the process of analysis, relationships or differences supporting or conflicting with original or new hypothesis should be subjected to test of significance to determine with what validity data can be said to indicate any conclusions(s).

HYPOTHESIS TESTING

After analysis the data as stated above, the researcher is in a position to test the hypothesis, if any, he had formulated earlier. Do the facts support the hypothesis or they happen to be contrary? The is the actual question which should be answered while testing hypothesis. Various tests, such as Chi square test, t-test, F-test have been developed by statisticians for the purpose. Hypothesis-testing will result in either accepting the hypothesis or in rejecting it. If the researcher had no hypothesis to start with, generalisations established on the basis of data may be stated as hypothesis to be tested by subsequent researches in times to come.

GENERALISTAIONS AND INTERPRETATION

If a hypothesis is tested and upheld several times, it may be possible for the researcher to arrive at generalisation, i.e., to build a theory. As a matter of fact, the real value of research lies in its ability to arrive at certain generalisations. If the researcher had no hypothesis to start with, he might seek to explain his findings on the basis of some theory. It is known as interpretation. This process of interpretation may quite often trigger off new questions which in turn may lead to further researches.

PREPRATION OF THE REPORT

Finally, the researcher has to prepare the report of what has been done by him. Writing of report must be done with great care keeping in view of the following:

- The layout of the report should be as follows: the preliminary pages; the main text, and the end matter.
- Report should ne written in a concise and objective style in simple language avoiding vague expressions such as ‘it seems,’ ‘there may be’, and the like
- Charts and illustrations in the main report should be used only if they present the information more clearly and forcibly.
- Calculated ‘confidence limits’ must be mentioned and the various constraints experienced in conducting research operations may be well stated.

PROBLEMS ENCOUNTERED BY RESEARCHERS IN INDIA

- The lack of scientific training in the methodology by research is a great impediment for researchers in our country.
- There is insufficient interaction between the university and research departments on one side and business establishments, government departments and research institutions on the other side.
- Most of the business units in our country do not have the confidence that the material supplied by them to researchers will not be misused and as such they are often reluctant un supplying the needed information to researchers.
- Research studies overlapping one another are undertaken quite often for want of adequate information this results in duplication and fritters away resources.
- There does not exist a code of conduct for researchers and inter university and inter departmental rivalries are also quite common.
- Many researchers in our country also face the difficulty of adequate and timely secretarial assistance, including computerial assistance.

- Library management and functioning is not satisfactory at. Many places and much of the time and energy of researchers is spent in tracing out the books, journals, reports, etc., rather than in tracing out relevant material. From them.
- There is also the problem that many of our libraries are not bale to get copies of old and new Acts/Rules, reports and other government publications in time.
- There is also the difficulty of timely availability of published data from various government and other agencies doing this job in our country.
- There may, at times, take place the problem of conceptualisation and also problems relating to the process of data collection and related things.

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