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RESEARCH METHODOLOGY
FOR MANAGEMENT DECISIONS

M.S.-95

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By: Subhash. G. Deo, B.A. (Hons), M.A., B. Journalism

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**Sample Preview
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QUESTION PAPER

Exam Held in
February – 2021

(Solved)

RESEARCH METHODOLOGY FOR
MANAGEMENT DECISIONS

M.S.-95

Time: 3 Hours]

[Maximum Marks: 100

Weightage: 70%

Notes : (i) This question paper contains two Sections : Section-A and Section-B.
(ii) Attempt any four questions from Section-A.
(iii) Section-B is compulsory.

SECTION-A

Q. 1. “It is often convenient to structure a research problem in terms of a hypothesis to be tested.” Explain the statement with the help of an example.

Ans. Ref.: See Chapter-2, Page No. 20, Q. No. 5 and Page No. 15, ‘Research Problem as Hypothesis Testing’.

Q. 2. What are the various methods of collecting primary data? Explain them along with their merits and demerits.

Ans. Ref.: See Chapter-4, Page No. 38, ‘Methods of Collecting Primary Data’ and Page No. 39, ‘Merits and Demerits of Different Methods of Collecting Primary Data’.

Q. 3. What do you mean by non-probability sampling? Mention the various non-probability sampling methods. Explain Quota sampling in detail.

Ans. Non-probability sampling is the sampling procedure which does not provide any basis for estimating the probability that each item in the population possesses to be included in the sample. In such a case, the sampling error is not measurable and the error in the estimator tends to increase sharply because the representativeness of the sample members is questionable. Nevertheless, non probability samples are useful in certain situations. This is the case when the representativeness is not particularly the primary issue. In pretesting a questionnaire, we are interested to ascertain its suitability for the problem under consideration. Non-probability sampling methods can be used to contact respondents in this case as the primary aim is to probe for the possible range of answers.

There are three types of non-probability sampling that may, under appropriate conditions, be useful in business and government. These are Convenience, Judgement and Quota Sampling.

Quota sampling is an important sampling method that involves a non-probability sampling technique in which sampling is not based upon the probability of appearance. In such a process, the researcher decides the selection of sampling based on some quota. In quota sampling, the researcher makes sure that the final sample must meet his quota criteria. The quota sampling is classified into two different types, such as:

- **Controlled Quota Sampling:** If the sampling imposes restrictions on the researcher’s/statisticians choice of sample, then it is known as controlled quota sampling. In this method, the researcher can be able to select the limited samples.
- **Uncontrolled Quota Sampling:** If the sampling does not impose any restrictions on the researcher’s/statisticians choice of sample, then it is known as uncontrolled quota sampling. In this process, the researcher can select the samples of their interest.

The steps for the process of quota sampling are listed below:

Step 1: Firstly, the population should be divided into mutually exclusive sub-groups.

Step 2: Next is to determine the proportions of the sub-groups made in the previous step, since the same proportion would be used during the sampling process.

Step 3: Now, the researcher has to choose individual observations or items from the subgroups. Also, the proportions found previously are to be taken into consideration

Step 4: The last and final step is to ensure that the obtained sample should be representative of the whole population and allow the researcher to study characteristics and traits.

“The sample obtained from a quota sampling method contains similar proportions of observations as the whole population with some known traits or characteristics. In quota sampling, the researcher selects from his/her judgement or some fixed quota. In other words, the sample observations are to be chosen based on some pre-specified virtues. Then the total sample contains the same distribution of characteristics that were assumed to be found in the population of concern”.

Some of the essential uses of quota sampling are as follows:

- In quota sampling, the judgment of sampling is done on the basis of convenience or a fixed quota. It is used when the decision of the researcher is final for choosing the samples
- The quota sampling is used because it allows the researchers to select a subgroup as a sample that is of great interest to study.
- This method is used when the researcher wants to determine the relationship between the subgroups.
- The quota sampling method should be selected when there is a limited time.

Q. 4. “Regression analysis is probably the most widely applied technique amongst the analytical models of association used in business research.”

Ans. The array of the 13 values are as follows:

10, 10, 11, 11, 11, 12, 13, 14, 15, 15, 16, 16, 17

Their corresponding ranks are:

1.5, 1.5, 4, 4, 4, 6, 7, 8, 9.5, 9.5, 11.5, 11.5, 13

(The highlighted boxed numbers are the values from Variety 1.)

The sum of corresponding ranks of the highlighted numbers is $T = 4 + 6 + 7 + 9.5 + 11.5 + 13 = 51$

$$\Rightarrow U = n_1 n_2 + \frac{n_1(n_1+1)}{2} - T = 6 \cdot 7 + \frac{6 \cdot 7}{2} - 51 = 12$$

Looking at the critical values table of the Mann-Whitney U with $n_1 = 6$ and $n_2 = 7$ and $\alpha = 0.05$, the critical value would be 6.

Since $U = 12 > 6$, we conclude that there is significant difference between the two yields, and the two varieties of mushrooms do not produce the same yield.

Explain the statement along with the assumptions of simple linear regression model.

Ans. Ref.: See Chapter-9, Page No. 104, ‘Regression Analysis’.

Q. 5. In a report what information is given by “Proposal” ? What are the various categories of reports? Explain them in brief.

Ans. Ref.: See Chapter-11, Page No. 123, ‘Proposal’ and Page No. 124, ‘Categories of Reports’.

Q. 6. Write short notes on the following:

(a) Analysis of Covariance

Ans. Ref.: See Chapter-3, Page No. 28, ‘Analysis of Covariance’.

(b) Scaling of Attitudes

Ans. Ref.: See Chapter-6, Page No. 61, ‘Scaling of Attitudes’.

(c) Editing of Data

Ans. Ref.: See Chapter-7, Page No. 71, ‘Editing of Data’.

(d) Presenter’s Poise

Ans. Ref.: See Chapter-13, Page No. 151, ‘Presenter’s Poise’.

SECTION-B

Q. 7. Two different varieties of mushrooms were grown on 6 and 7 plots of the same size. At the end of the crop run, the following quantities of yield were observed for the two varieties :

Variety I	16	12	11	13	15	17	
Variety II	11	11	10	15	14	16	10

Using the Mann-Whitney U test, verify at 0.05 level of significance whether the two varieties of mushroom produce the same yield.

(The value of test statistic for $u = 12$ is 0.117, $n_1 = 6$ and $n_2 = 7$)

Sample Preview of The Chapter

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RESEARCH METHODOLOGY FOR MANAGEMENT DECISIONS

Introduction to Research Methodology

Importance of Research in Decision-making

1

INTRODUCTION

Research in common parlance refers to a search for knowledge. One can also define research as a scientific and systematic search for pertinent information on a specific topic. In fact, research is an art of scientific investigation. The Advanced Learner's Dictionary of Current English lays down the meaning of research as "a careful investigation or inquiry especially through search for new facts in any branch of knowledge." Redman and Mory define research as a "systematised effort to gain new knowledge." Some people consider research as a movement, a movement from the known to the unknown. It is actually a voyage of discovery. We all possess the vital instinct of inquisitiveness for, when the unknown confronts us, we wonder and our inquisitiveness makes us probe and attain full and fuller understanding of the unknown. This inquisitiveness is the mother of all knowledge and the method, which man employs for obtaining the knowledge of whatever the unknown, can be termed research.

Under this chapter, we will discuss the various elements and importance of research in decision-making process.

CHAPTER AT A GLANCE

MEANING OF RESEARCH

Research is an academic activity and as such the term should be used in a technical sense. Research comprises defining and redefining problems,

formulating hypothesis or suggested solutions; collecting, organising and evaluating data; making deductions and reaching conclusions; and at last carefully testing the conclusions to determine whether they fit the formulating hypothesis. D. Slesinger and M.L. Stephenson in the Encyclopedia of Social Sciences define research as "the manipulation of things, concepts or symbols for the purpose of generalising to extend, correct or verify knowledge, whether that knowledge aids in construction of theory or in the practice of an art." Research is, thus, an original contribution to the existing stock of knowledge making for its advancement. It is the pursuit of truth with the help of study, observation, comparison and experiment. In short, the search for knowledge through objective and systematic method of finding solution to a problem is research. The systematic approach concerning generalisation and the formulation of a theory is also research. As such the term 'research' refers to the systematic method consisting of enunciating the problem, formulating a hypothesis, collecting the facts or data, analysing the facts and reaching certain conclusions either in the form of solutions(s) towards the concerned problem or in certain generalisations for some theoretical formulation.

Objective of Research

The purpose of research is to discover answers to questions through the application of scientific procedures. The main aim of research is to find out the truth which is hidden and which has not been discovered as yet. Though each research study has its

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own specific purpose, we may think of research objectives as falling into a number of following broad groupings:

1. To gain familiarity with a phenomenon or to achieve new insights into it (studies with this object in view are termed exploratory or formulative research studies);
2. To portray accurately the characteristics of a particular individual, situation or a group (studies with this object in view are known as descriptive research studies);
3. To determine the frequency with which something occurs or with which it is associated with something else (studies with this object in view are known as diagnostic research studies);
4. To test a hypothesis of a causal relationship between variables (such studies are known as hypothesis-testing research studies).

What makes people to undertake research? This is a question of fundamental importance. The possible motives for doing research may be either one or more of the following:

- (a) Desire to face the challenge in solving the unsolved problems, i.e., concern over practical problems initiates research.
- (b) Desire to get intellectual joy of doing some creative work.
- (c) Desire to get respectability.
- (d) Research assists in solving various operational and planning problems of business and industry.
- (e) Research helps to establish social relationships and solves social problems.
- (f) Research is used in all fields of applied economics, applied finance and applied mathematics etc. Research forms the fundamental base on which the economic and legislative policies can be built.
- (g) Research facilitates scientific, methodological and logical thinking of all.
- (h) Besides, it assists in Ph. D. thesis of students, assists philosophers and thinkers to establish their viewpoints, assists analysts and intellectual to develop new theories and ideas.

ROLE OF RESEARCH IN IMPORTANT AREAS

Businesses engage primarily in four types of research:

(i) Marketing Research: Marketing research (also called “consumer research”) comprises a form of applied sociological study, which concentrates on understanding the behaviours, whims and preferences, mainly current and future, of consumers in a market-based economy.

(ii) Market Research: Market research has a broad scope and includes all aspects of the business environment. It asks questions about competitors, market structure, government regulations, economic trends, technological advances, and numerous other factors that make up the business environment. Sometimes, the term refers more particularly to the financial analysis of companies, industries, or sectors. In this case, financial analysts usually carry out the research and provide the results to investment advisors and potential investors.

(iii) Product Research: This looks at what products can be produced with available technology, and what new product innovations near-future technology can develop.

(iv) Advertising Research: This attempts to assess the likely impact of an advertising campaign in advance, and also measure the success of a recent campaign.

Research inculcates scientific and inductive thinking and it promotes the development of logical habits of thinking and organisation.

Apart from marketing and production, research plays a crucial role in the following areas:

Banking: Almost all leading banks today have established a research department for collecting and analysing information that relates to their internal operations as well as external factors that can have an impact on their performance. Bankers today carry out in-depth research on economic conditions of various business sectors, effects of government's economic policies, new areas for banking growth, and so on. The Apex bank in the country R.B.I. has set-up one of the best research institutions of the country for research in planning and management reporting.

Materials Management

Research on ways to optimise costs involved in material purchases, inventory control, ordering, safety levels of various materials for uninterrupted production etc., is very important for any organisation. Materials management research helps in framing suitable policies on what to buy, how much to buy, when to buy, and price at which to buy. These are all crucial decisions and rely heavily on research in materials planning.

Human Resource Development

In addition to marketing, production, and materials management, research in optimum utilisation of available manpower, is also extremely important. Research is carried out in various areas of use of human resources. Some such areas are: cost of living, living standard of employees, employee turnover. Performance of the research is to do manpower planning.

Government

Planning Commission is central government's extended arm to carry out extensive research in

development planning for the country. All government policies are based on some basic research. Union, railway and States budgets are prepared every year after detailed economic survey and analysis of all sectors of development. Research is continuously done by government departments for economic planning and optimum utilisation of available resources in building up the national economy.

Governments, both at Central and State levels carry out huge research in many areas by systematically collecting required information and scientifically analysing it.

The role of research in several fields of applied economics, whether related to business or to the economy as a whole, has greatly increased in modern times. The increasingly complex nature of business and government has focused attention on the use of research in solving operational problems. Research, as an aid to economic policy, has gained added importance, both for government and business.

Research provides the basis for nearly all government policies in our economic system. For instance, government's budget rest in part on an analysis of the needs and desires of the people and on the availability of revenues to meet these needs. The cost of needs has to be equated to probable revenues and this is a field where research is most needed. Through research, we can devise alternative policies and can as well examine the consequences of each of these alternatives.

Research has its special significance in solving various operational and planning problems of business and industry. Operations research and market research, along with motivational research, are considered crucial and their results assist, in more than one way, in taking business decisions. Market research is the investigation of the structure and development of a market for the purpose of formulating efficient policies for purchasing, production and sales. Operations research refers to the application of mathematical, logical and analytical techniques to the solution of business problems of cost minimisation or of profit maximisation or what can be termed optimisation problems. Motivational research of determining why people behave as they do is mainly concerned with market characteristics, in other words, it is concerned with the determination of motivations underlying the consumer (market) behaviour.

PROCESS OF RESEARCH

The research process is a step-by-step process of developing a research paper. As you progress from one step to the next, it is commonly necessary to backup, revise, add additional material or even change your topic completely. This will depend on what you discover

IMPORTANCE OF RESEARCH IN DECISION-MAKING / 3

during your research. There are many reasons for adjusting your plan. For example, you may find that your topic is too broad and needs to be narrowed, sufficient information resources may not be available, what you learn may not support your thesis, or the size of the project does not fit the requirements.

The research process itself involves identifying, locating, assessing, analysing, and then developing and expressing your ideas. These are same skills you will need outside the academic world when you write a report or proposal for your boss, as these activities are frequently based on secondary sources from which recommendations or plans are formulated.

Definition of the Research Problem

Problem definition is the most critical part of the research process. Research problem definition involves specifying the information needed by management. Unless the problem is properly defined, the information produced by the research process is unlikely to have any value. Coca-Cola Company researchers utilised a very sound research design to collect information on taste preferences. Unfortunately for Coca-Cola, taste preferences are only part of what drives the soft drink purchase decision.

Research problem definition involves four interrelated steps:

- (1) management problem/opportunity clarification,
- (2) situation analysis,
- (3) model development, and
- (4) specification of information requirements.

The basic goal of problem clarification is to ensure that the decision maker's initial description of the management decision is accurate and reflects the appropriate area of concern for research. If the wrong management problem is translated into a research problem, the probability of providing management with useful information is low.

Situation Analysis

The situation analysis focuses on the variables that have produced the stated management problem or opportunity. The factors that have led to the problem/opportunity manifestations and the factors that have led to management's concern should be isolated.

A situation analysis of the retail trade outflow problem revealed, among other things, that (1) the local population had grown 25 per cent over the previous five years, (2) buying power per capita appeared to be growing at the national rate of 3 per cent a year, and (3) local retail sales of non-grocery items had increased approximately 20 per cent over the past five years. Thus, the local retailers sales are clearly not keeping pace with the potential in the area.

Creating the Research Design

Defining a research problem provides a format for further investigation. A well-defined problem points to a method of investigation. There is no one best method of research for all situations. Rather, there are a wide variety of techniques for the researcher to choose from. Often, the selection of a technique involves a series of trade-offs. For example, there is often a trade-off between cost and the quality of information obtained. Time constraints sometimes force a trade-off with the overall research design. Budget and time constraints must always be considered as part of the design process.

Research design can be categorised as either descriptive or causal. Descriptive studies are meant to answer the questions of who, what, where, when and how. Causal studies are undertaken to determine how one variable affects another.

There are three basic methods of research:

- (i) survey,
- (ii) observation, and
- (iii) experiment.

Each method has its advantages and disadvantages.

The survey is the most common method of gathering information in the social sciences. It can be a face-to-face interview, telephone, or mail survey. A personal interview is one of the best methods to obtain personal, detailed, or in-depth information. It usually involves a lengthy questionnaire that the interviewer fills out while asking questions. It allows for extensive probing by the interviewer and gives respondents the ability to elaborate their answers. Telephone interviews are similar to face-to-face interviews.

Observation research monitors respondents' actions without directly interacting with them. It has been used for many years by A.C. Nielsen to monitor television viewing habits. Psychologists often use one-way mirrors to study behaviour. Social scientists often study societal and group behaviours by simply observing them. The fastest growing form of observation research has been made possible by the bar code scanners at cash registers, where purchasing habits of consumers can now be automatically monitored and summarised.

In an experiment, the investigator changes one or more variables over the course of the research. When all other variables are held constant (except the one being manipulated), changes in the dependent variable can be explained by the change in the independent variable. It is usually very difficult to control all the variables in the environment. Therefore, experiments are generally restricted to laboratory models where the investigator has more control over all the variables.

Sampling

It is incumbent on the researcher to clearly define the target population. There are no strict rules to follow, and the researcher must rely on logic and judgement. The population is defined in keeping with the objectives of the study.

Sometimes, the entire population will be sufficiently small, and the researcher can include the entire population in the study. This type of research is called a census study because data is gathered on every member of the population.

Usually, the population is too large for the researcher to attempt to survey all of its members. A small, but carefully chosen sample can be used to represent the population. The sample reflects the characteristics of the population from which it is drawn.

Sampling methods are classified as either probability or no probability. In probability samples, each member of the population has a known probability of being selected. Probability methods include random sampling, systematic sampling and stratified sampling. In no probability sampling, members are selected from the population in some non-random manner. These include convenience sampling, judgement sampling, quota sampling, and snowball sampling. The other common form of no probability sampling occurs by accident when the researcher inadvertently introduces non-randomness into the sample selection process. The advantage of probability sampling is that sampling error can be calculated. Sampling error is the degree to which a sample might differ from the population.

Random sampling is the purest form of probability sampling. Each member of the population has an equal chance of being selected. When there are very large populations, it is often difficult or impossible to identify every member of the population, so the pool of available subjects become biased. Random sampling is frequently used to select a specified number of records from a computer file.

Systematic sampling is often used instead of random sampling. It is also called an Nth name selection technique. After the required sample size has been calculated, every Nth record is selected from a list of population members. As long as the list does not contain any hidden order, this sampling method is as good as the random sampling method. Its only advantage over the random sampling technique is simplicity.

Stratified sampling is commonly used probability method that is superior to random sampling because it reduces sampling error. A stratum is a subset of the population that shares at least one common characteristic. The researcher first identifies the relevant strata and their actual representation in the