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Analysis Techniques and Strategies-Research acuity

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Abstract: *From the ramification of analytical techniques and strategies, a researcher may face inconvenience. Again the complex social fallacy, use of information technology, and ever changing needs of human make the scenario more complex than ever. This study tried to provide with a simple picture of the analytical techniques along with strategies, cover the whole research process and choose the appropriate instruments to take effective decisions efficiently. Secondary data were used without any statistical analysis. Diagrams are given in the required places from different materials of different researchers to have the overall concept regarding univariate, bivariate and multivariate techniques. A brief discussion was made in respect of ANOVA, MANOVA, -test, Z-test and so forth. Few statements in terms of recommendations are given to uplift the world of research in a state of art fashion.*

Keywords: *Research, Information Technology, Research Tools, Statistical Test*

1 Introduction

The world has been changing in the most dynamic manner. Evolution of human civilization tells us that creation of new knowledge contributed to the development of standard of living by solving problems of different types (Ghosh, 2008). Knowledge may be gained by various ways and among all; scientific approach is the best one. By dint of above mentioned approach, research may and can be reasonably acceptable. The research, obviously the scientific one, has analysis part where different type or types of techniques and strategies are used before interpreting and reaching for decisions. Analysis is not just calculations for drawing an inference, rather there are some philosophy in this regard. Phenomenology and analytic philosophy are the two most influential philosophical movements of the twentieth century (Thompson and Zahavi, 2006). More clear the philosophy, more meaningful the interpretation and thus, more logical the inferences.

Concerns of this attribute sometimes get themselves into perplexity in selecting appropriate one or ones from the ramification of the strategies. Now-a-day the evaluation of mixed method, quantitative and qualitative, is complicating the analysis process (Brayman, 2006). The complexities are coming in different manner and different terms like multi-methods (Brannen, 1992), multi-strategy (Brayman, 2004), mixed-methods (Creswell, 2003), mixed-methodology (Tashakkori and Teddlie, 1998) and so forth. Again, ecological fallacy, which may be caused by drawing conclusion from wrong units of analysis (Bernard, 1995).

This study emphasized on existing techniques and strategies and tried to simplify the overall scenario of the phenomenon. For appropriate analysis it is very essential to know the process in a nut shell. Research is a movement from the known to the unknown, searching for truth and a scientific search for information on a specific issue of interest. Some people say that research is a process of searching a black cat in a dark room where there isn't a cat. In a sense, the statement is true. As there is no absolute truth (except from the religion perspective), it is only the assumption that solution (truth) can be found by following some guided procedure

(steps). There are various types of research like descriptive research, analytical research, fundamental research, applied research, conceptual research, empirical research, quantitative research, qualitative research and so forth.

2 Objectives

- To have a succinct vision on research from business perspective
- To clear the overall bewilderment and also to abridge the scenario in analysis
- To choose the apposite strategies to analysis from the ramification

3 Literature Review

Lots of researches are done and have been conducting by a significant number of researchers in the world. C. R. Kothary, S P. Gupta, M. P. Gupta, Naresh. K. Malhotra and lots of western researchers contributed in this phenomenon. All of them tried to focus in a particular field but not the whole scenario or may be the whole scenario, but in a complex manner, especially to the young researchers. This is because their perceptions and the appeal of the time. Thus, there is always a need to have the concepts in the easiest manner, which the author thought was not available, especially in the Bangladesh context. One book named 'Research Methodology in Business' by Professor Dr. Ameeruz Zaman Khan, published under the supervision of University Grants Commissions (UGC), in 2005 where some of the ingredients fulfilled the emptiness. Still a long way to go.

4 Methodology

This study was conducted in a descriptive manner with qualitative approach. Recently collected secondary data were used to validate and authenticate the research for creating information Journals with the state of excellence, books with wide-ranged appreciation and value judgments of the renowned professors of universities are the sources of the secondary data.

5 Analysis

5.1 Research Process

Knowing what is to be accomplished determines the research process (Hoque, 2008). There are several steps and these are discussed in the following statements.

1. Formulation the research problem: A research problem is a brief statement indicating the general purpose, the key variable(s) and the boundaries of the research. It is usually accompanied by a set of specific research questions concerning aspects of the key variables of its relationships with other variables. Research questions are the problems which are not resolved till date. Such questions may include the purpose of the study (objectives), place of the study, present state of the research issue and the possible means of finding solution to the research problem(Shamim, 2020).

2. Extensive literature survey: Secondary data sources need to be studied to observe information concerning the problem(s) in hand.
3. Developing hypothesis: A hypothesis is an untested proposition made in order to draw out and test its logical or empirical consequences. It should be very specific and limited to the piece of research in hand because it has to be tested. There are some evaluating techniques such as Chi-square test, t-test, f-test, ANOVA, ANCOVA and so forth.
4. Preparing the research design: A research design is the plan and structure specifying the methods and procedures for collecting and analyzing data with an ultimate goal of answering research questions. Exploratory, Descriptive and Causal are the major types of research design.
5. Determining the 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 a census inquiry. It is quite impossible due to different constraints such as time, biasness, lacking experience and so forth. For this reason, some items of a 'population' are selected in a prudent manner and those items are termed a 'sample'. The outcome after analyzing the 'sample' expected to represent the outcome of the 'population'. It is of two types, probability and non-probability sampling. Then 'sample' size, nature of inquiry and such related factors are taking under consideration in this part of conducting research.
6. Collecting the data: Data are raw facts or observation and when converted to a meaningful and useful context for specific end user, can be termed as information.
7. Execution of the project: For effective outcome, the execution has to be proceeded in a systematic manner, decided in the research design part. Continuous monitoring is needed to keep the procedure in the expected track.
8. Analysis of data: After the data have been collected, the data need to be prepared through closely related operations such as establishing categories, coding, editing, and tabulating. Then statistical techniques (univariate, multivariate etc.) and statistical strategies (frequency distribution, mean, standard deviation, correlation etc.) need to be applied according to the plan of data analysis made in the methodology. SPSS and such software help researchers to calculate the above mentioned tools by the blink of the eyes. But researcher should know which tools should be used and why.
9. Testing of hypothesis: As the hypothesis was drawn at the starting of research design that has to be tested in this part of process. Again SPSS and such software help researchers to test. It is the prudence and experience of the researcher to go through the exact test(s). Chi-square, t-test, z-test, ANOVA and lots of techniques are there to test the hypothesis.
10. Generalization and interpretation: If a hypothesis is tested and upheld several times, it may be possible for the researcher to arrive at generalization, i.e., to build a theory. If the researcher had no hypothesis to start with, he/she might seek to explain his/her findings on the basis of some theory.
11. Preparation of the report: There are some formats on presentation of a research project. Two ways of presentation may be required, oral and written. Each type possesses different issues and concentration.

5.2 Analysis of Data

Analysis is the computation of certain indices or measures along with searching for patterns of relationship that exist among the data groups. Two major types of analysis may be observed and they are as follows.

1. Descriptive analysis: It is the study of distribution of variables. Analysis of one variable (univariate), two variables (bivariate) and more than two variables (multivariate) are done to measure the size, shape etc. of distributions along with the study of measuring relationships among the variables. Correlation, regression, discriminant, MANOVA, canonical etc. analysis are the strategies in this type of analysis.
2. Inferential analysis: This analysis is concerned with the various tests of significance for testing hypothesis in order to determine with what validity data can be said to indicate some conclusion. It is also concerned with the estimation of the population values. Interpretation is done on the basis of inferential analysis.

5.3 Different Analysis Techniques

Univariate Techniques

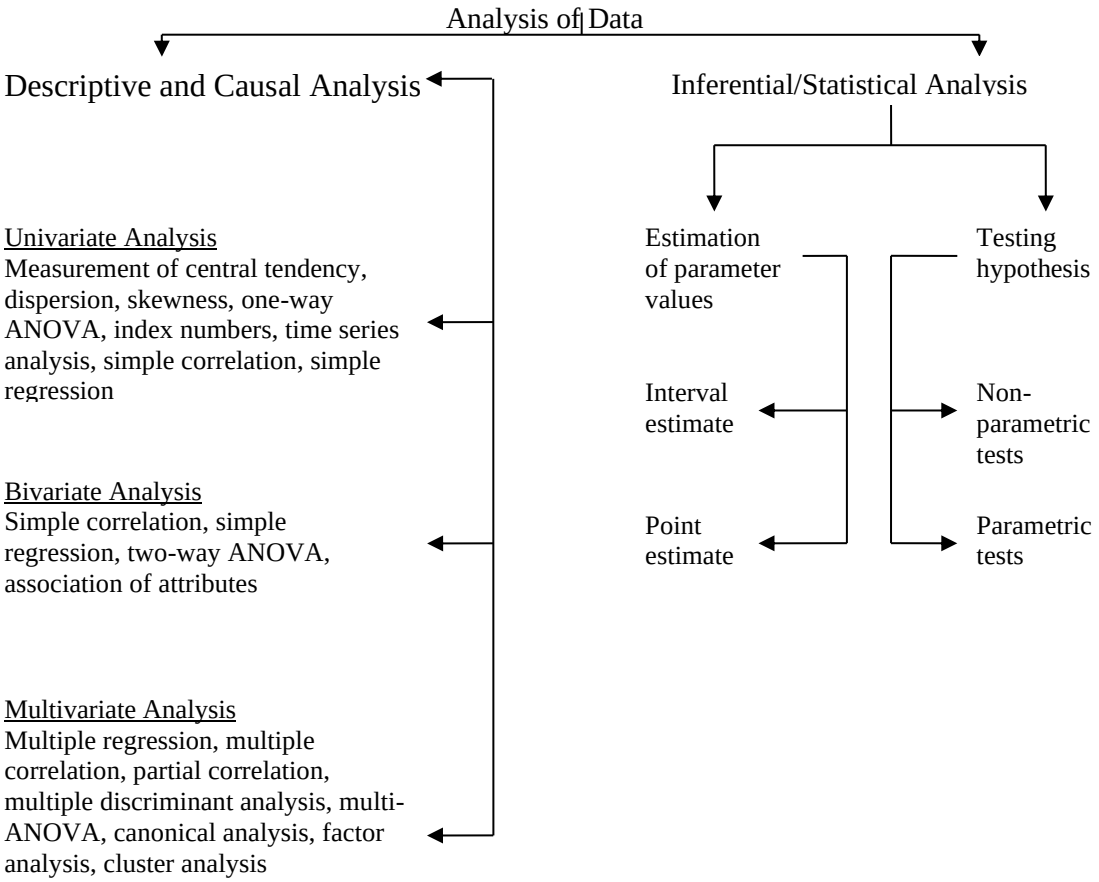

Diagram 01: Different types of Analysis: At a Glance

Univariate techniques allow the researcher to assess the statistical significance of various hypotheses about a single variable. The following tests are popular when used by researchers.

Bivariate Techniques

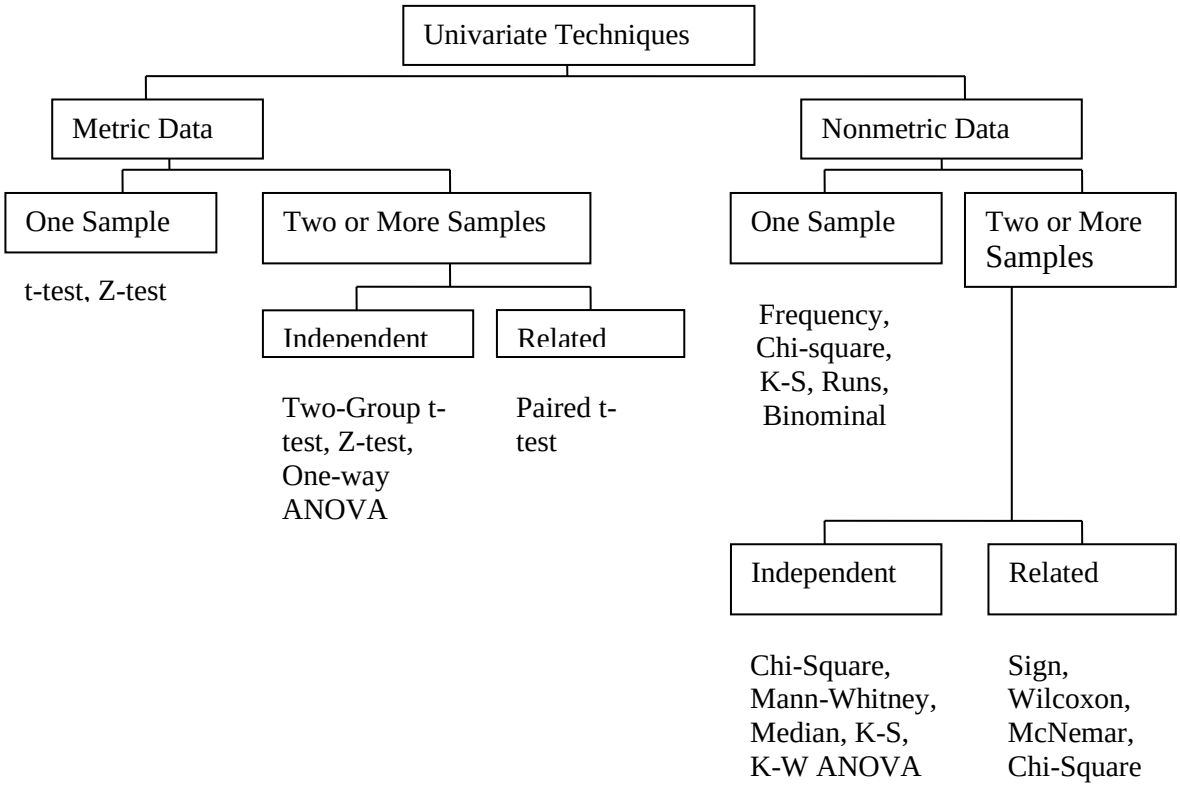

Diagram 02: Univariate Techniques-at a glance;
Source: Marketing Research, 3rd edition, N. K. Malhotra (2003)

Bivariate techniques deal with tests of differences or measure of association between two variables at a time. For normally distributed population or sample (parametric statistics) Chi-square, t-test, Z-test and ANOVA and for nonparametric statistics, Kolmogorov-Smirnov (one-sample), Mann-Whitney (two independent samples), Kruskal-Willis test (three or more samples)and Wilcoxon matched-pairs signed-ranks test and sign test (two related samples) are the common ones used by researchers.

For parametric distribution, correlation coefficient (r), the coefficient of determination (r^2) liner regression, ANOVA tests etc. and for nonparametric ones, Spearman's rank-order correlation coefficient, The Kendall rank correlation coefficient etc. are the popular ones used to test the association between the variables.

Multivariate Techniques. Dealing with many variables at the same time is referred to as multivariate analysis (Hinton, 2004). Multiple regression, Multiple discriminant analysis, Multivariate analysis of variance, Canonical correlation analysis, Factor analysis, Cluster analysis, Multidimensional Scaling, Latent structure analysis, Path analysis, Conjoint analysis, Logit, Probit etc. are the widely used techniques where there are more than two variables.

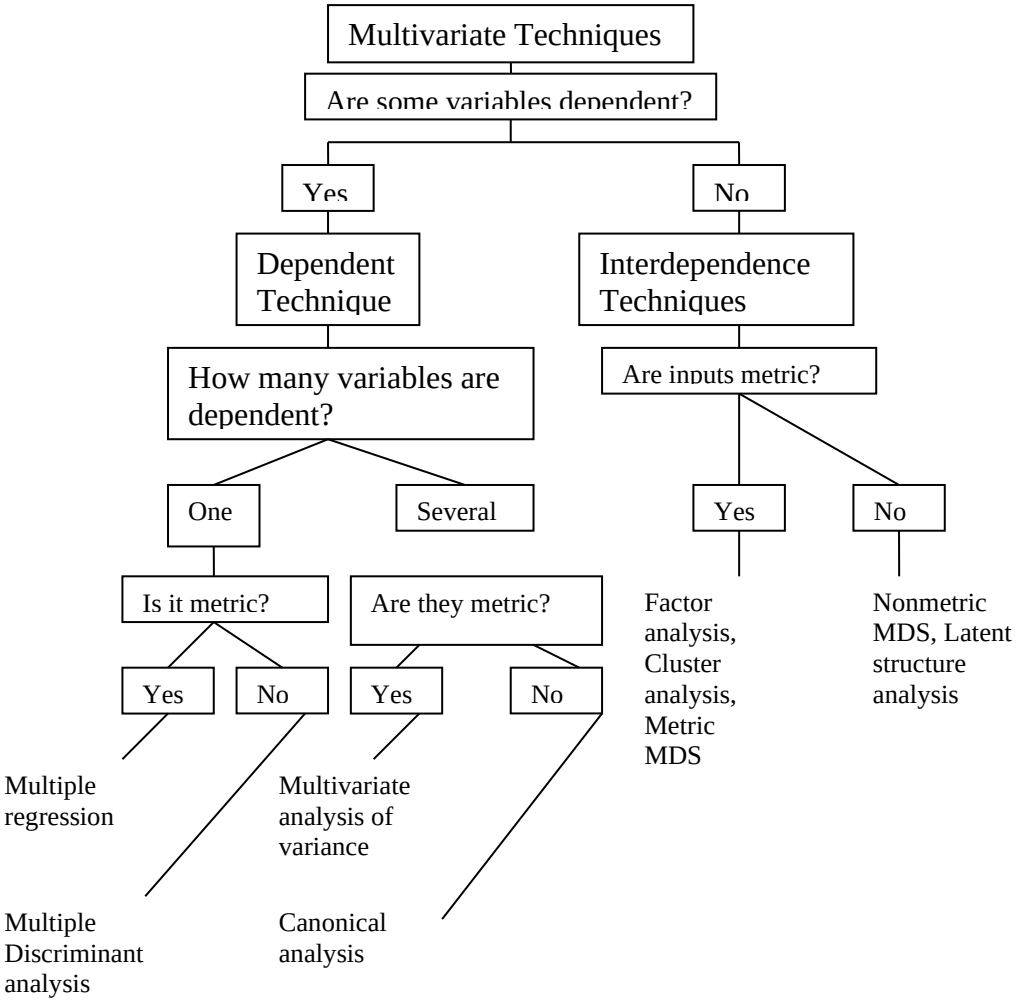

Diagram 03: Multivariate Techniques-at a glance;
Source: Research Methodology, C. R. Kothary (2001)

6 Conclusion and Recommendations

There is no conclusion in the field of analysis and thus research. It is only the effort with desire for truth which may lead to the zenith of success, effusively or moderately. It is the experience, knowledge, aspiration, liberty, valor and above all, the prudence of the researcher to use appropriate tools in drawing decisions. As the techniques are the items of continuous change, the researcher should and must attach him or herself to cope with. A researcher should and must be conversant with recent trends, new knowledge, innovations, and technologies and so forth. For technology, Pajares (2008) stated that a researcher must identify the tools to be used in the analysis at his or her proposal. Above all, the researcher has to take account the contribution that his analysis and decision can draw in favor of the humanity.

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