THE DETERMINANTS OF SURVEY DESIGN IN A RESEARCH UNDERTAKING

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Abstract: Studies have shown that many researchers have poor results and conclusions because the bedrock of the research which is the survey design is being neglected or wrongly applied. This is due to the fact that the research proposal, objectives and its administration are not properly applied. It becomes apparent that attention should be given to survey design in any research because it involves the use of samples or collection of data which invariably will be used in getting the desired result. Hence, this paper tends to identify the components of survey design in a research, which are cross-sectional and longitudinal research design. Also it explains the determinants of survey design by research students in management and social sciences. This study concluded by analyzing the determinants of survey design such as establishing the goals, selection of sample, timeline, mode (administering questions and recording response), development of questions, reliability and validity as basis of a good research work.

Keywords: Survey, Research, Design and Determinants.

1. INTRODUCTION

1.1. Introduction

Knowing what the client wants is the key factor to success in any business. News media, government agencies and political candidates needs to know what the public thinks. Associates need to know what their members want. Large companies need to measure the attitudes of their employees. The best way to find this information is to conduct a survey.

A survey therefore, is a data collection tool used to gather information about individuals or business. Surveys are used in all research undertakings. A survey may focus on factual information about individuals or it might aim to collect the opinions of the respondents. This is commonly used in disciplines such as psychology, health, marketing, sociology, governance and demographics.

It can be very tempting to press ahead with designing a survey without having the clear knowledge about the purpose of the study and the research methodology. However, before designing a survey, it is helpful and generally recommended to clearly establish a research proposal. This is because poor research results and conclusion emerge from poor data, which are often due to poor survey design. Thus, learning resources is to examine survey design in a research undertaking with emphasis on survey design and its components.

1.2. Statement of the problem

It has been observed for years that survey design or its application has been neglected in many research undertaking or projects. And the utility and essence inherent design cannot be overlooked. This is because the instruments or procedures used in carrying out most of all social and management sciences projects are features of survey design and yet its usage is totally ignored. Although, there are various types of research methods but this article is emphasizing the importance of survey design and ties uses in a research. And in an effort to address this, the following objectives are to be achieved.

1.3. Objective of the Study

The objectives of this paper are to:

- i. Examine Survey Design as one of the research methods used in both social and management sciences;
- ii. Examine the determinant factor when adopting survey design in a research undertaking, and;
- iii. Assess the applicability of survey design in a research, and
- iv. Proffer recommendations if possible.

1.4. Methodology

The sources of data collection are secondary. This is because the method of data collection is based on analyzing of literature, documents, journals, internet, projects and unpublished books and thus, it is a qualitative analysis.

And most importantly is the empirical assessment of selected student's journal in the Faculty of Management Sciences which, was examined with a view to enable the researcher concludes with the necessary recommendations.

2. CONCEPTUAL ISSUES

2.1 Research

According to one reference work by Web Centre for Social Research, research in common parlance, refers to a search for knowledge. It can also be defined as a systematic search for pertinent information on a specific topic. In fact, research is an art of scientific investigation. That is why some people consider research as a movement from the known to the unknown. It is actually a voyage of discovery. This is because we all possess the vital instinct of inquisitiveness. When the unknown confronts us, more and more our inquisitiveness make us probe and attain understanding of the unknown. This inquisitiveness is the mother of all knowledge and the method, which one employs for obtaining the knowledge of whatever the unknown, can be termed as research.

For instance, in the well-known nursery rhyme

Twinkle, Twinkle Little Star

How I wonder What You Are

The use of the word's *how* and *What* essentially summarizes what a research is. This is because, these two words "What" and "How", will move a researcher to find out what the star is made up and how it exist in the sky. It is an investigation of finding solutions to scientific and social problems through objective and systematic analysis. A research can lead to new contributions to the existing knowledge.

However, research is not confined to science and technology only. There are vast areas of research in other disciplines such as languages, literature, history and sociology. Whatever might be the subject, research has to be an active, diligent and systematic process of inquiry in order to discover, interpret or revise facts, events, behaviours and theories. And applying the outcome of research for the refinement of knowledge on other subjects, or in enhancing the quality of human life also becomes a kind of research and development. (Rajasekar, 2013).

According to Clifford Woody, research comprises defining, redefining problems, formulating hypothesis or suggested solutions; collecting, organizing and evaluating data; making deductions and induction, reaching conclusions, and at last carefully testing the conclusions to determine whether they fit the formulating hypothesis. Thus, research is 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.

Asika (2005), suggested that, it is two separate world of our reasoning process. That is, the world of reality and the imagery world (the world of theory or abstraction). But Scientists are interested in the world of reality because they believe in the existence of reality since it is a phenomenon which exist somewhere and can be verified empirically.

Conclusively, the term 'research' refers to the systematic method consisting of enunciating the problem, formulating a hypothesis, collecting the facts or data, analyzing the facts and reaching certain conclusions either in the form of solution(s) towards the concerned problem or in certain generalization for some theoretical information.

2.2. Research Design

Research Designs means the structuring of investigation aimed at identifying variables and their relationships to one another. This is used for the purpose of obtaining data to enable the researcher test hypothesis or answer research questions. It is an outline or a scheme that serves as a useful guide to the researcher in his efforts to generate data for his study. Research designs are therefore, used by researcher as a scheme or a blueprint for data collection, prior to the actual study. It is a useful guide.

As suggested by Trochim (2005), research design "provides the glue that holds the research project together. A research design is used to structure the research, to show how all of the major parts of the project such as the samples or groups, measures, treatments or programs and methods of assignment work together to try to address the central research questions". The research design is like a recipe. Just as a recipe provides a list of ingredients and the instructions for preparing dish, the research design provides the components and the plan for successfully carrying out the study. Therefore, a research design is the "backbone" of the research protocol.

Research studies are designed in a particular way to increase the chances of collecting the information needed to a particular question. The information collected during research is only useful if the research design is sound and follows the research protocol. When the researchers carefully follow the procedures and techniques outlined in the research protocol will increase the chance that the results of the research will be accurate and meaningful to others. Adhering to the research protocol and the design of the study is very important because the results can then be reproduced by other researchers. And the more often results are reproduced; it is more likely that researchers and the public will accept these finding as true. It is therefore suffice to say that, research design refers to the overall strategy employed to integrate the different components of the study in a coherent and logical way, thereby ensuring that the research problem is effectively addressed. (De Vaus, 2001).

Additionally, the research design must make clear the procedures used to ensure the protection of research subjects, whether human or animal, and to maintain the integrity of the information collected in the study. And since it constitutes the blueprint for the collection, measurement and analysis of data, thus having a clear focus on the study, usually determines the type of design to use.

Taking cognizance of this, the following are the three main categories of designs that emerge from the classifications of research. These are survey, experimental and Ex post facto designs but survey design will be the main discuss in this work.

2.3 Survey Design

Before explaining survey design, it is imperative to know what a survey research is. As opined by (Isaac & Michael, 1997, p.136), a survey research gives answer to questions that have been raised, to solve problems that have been posed or observed, to assess needs and set goals to determine whether or not specific objectives have been met, to establish baselines against which future comparisons can be made, to analyze trends across time and generally, to describe what exists, in what amount and in what context. In survey research, independent and dependant variables are used to define the scope of study, but cannot be explicitly controlled by the researcher. This is in contrast to survey design, which is simply a data collection tool for carrying out survey research.

Kraemer (1991, p.13), identified three distinguish characteristics of survey research. First, survey research is used to quantitatively describe specific aspects of a given population. These aspects often involve examining the relationships among variables. Second, the data required for survey research are collected from people and are, therefore, subjective. Finally, survey research uses a selected portion of the population.

While, Avwokeni (2003: Pg. 69-70) states that, in a survey design, data are collected from the subjects without imposing any condition or treatment on them. The researcher simply asks for information through questionnaires and/ or an oral interview schedule. And if one wants to design a survey, the first thing to examine is the population. If the subjects (population) are similar (homogeneous), then, design the sample, choose the respondents, and construct a questionnaire to collect data. This design model is called non-comparative survey design. See diagram below:

Non-Comparative Survey Design

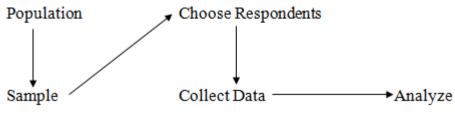


Figure 1

On the other hand, if the population is heterogeneous (demographic), either in age tribe or productivity then classify them into blocks with similar characteristics. In each block, design separate sample, choose respondents from each sample and collect data from them. This comparative survey design involves stratifying the population subjects into groups using a criterion. This is represented diagrammatically below:

Comparative Survey Design

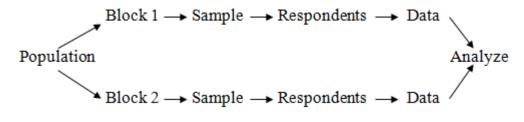


Figure 2

But if the subjects are randomly allocated, they form groups known as block. A block refers to a group of subjects that are similar in ways that are likely to affect the results. This is shown in figure 3 below:

Block Survey Design

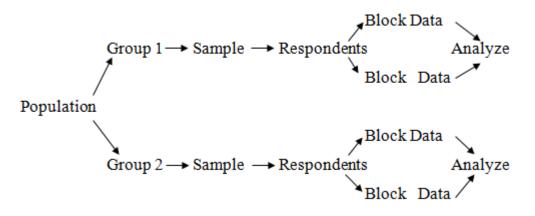


Figure 3

While, Levy and Lemeshow (1999: Pg. 6) opines that, survey designs involves two steps. First, a sampling plan must be developed. The sampling plan is the methodology that will be soused to select the sample from the population. The sampling plan describes the approach that will be used to select the sample, how an adequate sample size will be determined, and the choice of media through which the survey will be determined. Survey media include telephone, face-to-face interviews, as well as mailed surveys using either postal or electronic mail.

Secondly, procedures (methods) for obtaining population estimates from the sample data for estimating the reliability of those population estimates must be established. This process includes identification of the desired response rate and the preferred level of accuracy for the survey (Sallant & Dillman, 1994, p.3).

So, survey design is used mainly for the purpose of identification, description, explanation and prediction of states of affairs about certain phenomena and variables, and their interrelations in a natural setting overtime and different agerelated groups.

Survey design has both its advantages and disadvantages. These are as follows:

Survey Strength:

i. Surveys are capable of obtaining information from large samples of the population.

ii. They are also well suited to gathering demographics data that describe the composition of the sample.

iii. Survey design are inclusive in the types and number of variables that can be studied, require minimal investment to develop and administer, and are relatively easy for making verbalizations.

iv. Surveys can also elicit information about attitudes that are otherwise difficult to measure using observational techniques. However, it is important to note that surveys only provide estimate for the population, not exact measurement (Sallant & Dillman, 1994, p.3).

Survey Weaknesses:

i. Sources of error from survey include international misreporting of behaviours by respondents to confound the survey results or to hide inappropriate behaviours.

ii. Bell (1996), observed that biases may occur, either in the lack of response from intended participants or in the natures and accuracy of the responses that are received.

iii. While Pinsonmeault and Kraemer (1993), postulated that surveys are generally unsuitable where an understanding of the historical context of phenomena is required.

iv. And finally, respondents may have difficulty assessing their own behaviour or have poor recall of the circumstances surrounding their behaviour.

i. Cross-sectional Research Design

Cross-sectional Survey Research Design is a developmental field study that is characterized with large representative samples of subjects drawn randomly from population to be comparatively investigated simultaneously. That is, a number of different groups of individuals belonging to a population with different variable such as age or education are randomly sampled from specific population and are studied at one particular period of time of about some months for data collection. The point being emphasized here is that cross-sectional survey research design necessarily requires either direct study of the population in its entirety or of a large sample that adequately represents the various unit or cohort in the population proportionally. And it entails three dimensions of designs such as descriptive, explanatory and exploratory research design. These three components of cross-sectional survey designs are used for different study purposes and situations and all of them use one-time-only observation but involve as many variables as are necessary for the study.

The *descriptive research design* gives a picture of a situation or a population. Accurate descriptions are imperative for making wide range of policy decision. It involves one time observation of independent and non-manipulated variables. As the name implies, it is used to describe a variable. This may include social survey, public opinion survey, etc.

The *exploratory design* is a descriptive design geared towards the collection of data for hypothesis testing. These are relevant data and information collected through self administered questionnaire, structured oral interviews and discussions. While the *exploratory design* focuses on the use of data collected to answer research questions or explain (analyze) the relationship among variable. This is where the use of statistical techniques for data analysis such as the Chi-square value statistics.

ii. Longitudinal Survey Design

In longitudinal design, we watch changes in the variables of study at different points in time. It is studies developmental change and constancy in specific attributes of the same sample of participants or subjects repeatedly over an extended span of time for comparison to be made on the variables. It is a very useful tool in behavioural science research. In

business research, it can be used in such studies as learning curve, motivation of workers, productivity of employees, overtime and even profitability trend. Longitudinal designs include trend, cohort and panel.

In *trend*, each set of observations is directed at different samples of the same population at various points in time. The observations are focused on one or more independent variables. Data that are gathered from the observation may be used to plot a trend or curve.

A *cohort* design has to do with a sampling procedure. The researcher observes relevant independent variables on a specific group from a population, each time the observation is to be made and over a period of time. Cohort design uses a sample of relatively narrower range of variation and the variables of interest are studied at several years interval. For example, when using age (variable) in studying productivity (variable of interest) in a firm, a researcher may define the population of study as all workers but restricts his observation to a specific group of worker between 40-45 years. Every year the researcher draws a different sample from this subgroup and does this for several years before analyzing his data.

While that of *panel* design and aims at drawing the same measurement at different points in time and always from the same sample. Panel design is used to study changes in the opinion of respondents on one variable over a period of time.

In fact, all survey designs are time designs because time is a variable that is recognized but is neither controlled nor manipulated. It is only assumed to 'affect' changes in the behaviour of the variables being studied. (Nnamdi, 2005). (See figures 1,2 and 3 above).

3. THE DETERMINANT'S FACTORS FOR ADOPTING SURVEY DESIGN

Survey designs used to generate primary data because when we use survey designs, we are involved in a direct observation of events, phenomenon or in an experiment. There is no type of design that ever gives secondary data but secondary data emanate from the processing of primary sources. For instance, when a questionnaire is administered to beer consumers in order to study brand loyalty in the beer industry, the data gathered through this exercise are from a primary source. On the other hand, if some statistical analysis such as frequency counts and other descriptive statistical analysis are done and the data arranged accordingly, typed or printed, any researcher making use of them at this point is collecting secondary data from a secondary sources. The following are some of the determining factors in a research.

i. Establish the Goals: What the researcher went to learn or how he will use

the information. The usual goal of a survey is to describe a population. So, the goals of the project will determine whom the researcher will survey and what he ask them. If the researcher goals are unclear, the results will probably be unclear. Such typical goals include, learning about employee attitudes, rating of current products and services, Associations member's opinions etc.

ii. Select Your Sample: There are two main components in determining

whom the researcher will interview. The first is deciding what kind of people to interview. Researcher often calls this group the target population. If the researcher conduct an employee attitude survey or an association membership, the population is obvious. But if the researcher is trying to determine the likely success of a product, the target population may be less obvious. Correctly determining the target population is critical because if the right kinds of people are not interviewed, the researcher will not successfully meet his or her goals.

Secondly, is to decide how many people the researcher need to interview. Statisticians know that a small representative sample will reflect the group from which it is drawn. The larger the sample, the more precisely it reflects the target group. With a sample size, the researcher will be able to follow-up the contacts to encourage respondents. As a result of these efforts, participants and data quality may be improved.

iii. **Timing:** Developing a timeline is a crucial step in planning your survey.

When is the survey data needed? When would be the best time to contact potential participants? Does the researcher want to survey during a break or at a time when respondents are engaged in another activity with your unit? What other workloads issues may affect those involved in sending the survey, collecting and analyzing the result? How long will it take to design and obtain approval for the survey. How much time is needed for collecting responses? The answers to all these questions will help to develop a realistic timeline for the study.

iv. **Mode:** The combination of choices (face-to-face interviews, telephone interviews, and self-administered questionnaires), the researcher make about contacting sample members, administrating questions and recording responses is called the "mode". The mode is influence by the survey population, the study topic, and how the researcher plans to use the information he or she gather.

v. **Develop Questions:** Writing good survey questions requires keeping the goal of the survey firmly in mind and then formulating each question with the perspective of the respondent. This entails careful development of well-worded questions with appropriate response formats.

vi. **Reliability:** Reliability is the extent to which repeatedly measuring the same property or population produces the same result. Ideally, each survey question will mean the same thing to everyone, including those administering the survey. So, careful design and refinement is necessary.

vii. Validity: Validity is the extent to which a survey question measures the property it is supposed to measure (the project's purpose).

3.1.1 Empirical Demonstration of the Application of Survey Design

A Journal Paper entitled "Influence of Marketing Environmental Factors on the Performance of Small and Medium Firms: A Case Study of Kaduna State Ministry of Commerce Directory of Business" was examined as presented below.

The study specifically aims at examining the influence of marketing environmental factors on the performance of SMEs in Kaduna State. Thus it attempts to answer the following questions:

- i. To identify marketing environmental factors that influence the performance of SMEs in Kaduna State; and
- ii. To determine the influence of marketing environmental factors on the performance of SMEs in Kaduna State.

Methodology

1279 business firms were registered on the list of Kaduna State directory of business establishments published by Ministry of Commerce and Industry as at 2006 and it is still the latest edition as at 2010. Out of 1279 business firms 1230 are functional while 49 are closed down. 74 out of 89 big business firms are in operation. 1156 out of 1195 Small and Medium Scale Enterprises constitute the population of the study. However, the impossibility surrounding the inclusion of all the element of the population in a study made sampling essential in this study like many others. The study will determine its sample size by adopting Roscoe (1975) 10% rule of thumb which says that 10% of a study population is enough as sample size. This study used 10% of the 1156 registered Small and Medium Scale enterprises on the list of the Kaduna State Ministry of Commerce and industry as the study's sample size.

This is calculated thus;

<u>10 x 1156</u>

100 = 115.6

This figure is approximated to 116; therefore, the owners of 116 registered Small and Medium Scale enterprises constitute the sample size of the study. The 116 registered Small and Medium Scale enterprises are selected through purposeful sampling method from size Local Government areas (LGAs) in the state. These six LGAs were taken across the three senatorial districts in the state. The choice of these LGAs is born out of the fact that the LGAs are hub of economic activities in the state and three of out of the six LGAs are located within the state capital. These LGAs are Kaduna North, Kaduna South, Chikun, Zaria, Sabon-Gari, and Jama's the first three are located within Kaduna metropolis respectively.

This study sourced its data through the primary and secondary sources. The data was sourced through questionnaires that were administered on 116 Small and Medium Scale business owners across the six LGAs. The questionnaire has two sections, that is A and B. Section A seeks demographic information while section B elicits response from the target elements on the influence of marketing environmental factors on the performance of SMEs in Kaduna State. The questionnaire comprises of a set multiple choice as well as Likert scale questions. It has five alternative options which is scored in the following order, 5 points is strongly agree, 4 points is Agree, 3 points for Undecided, 2 points for Disagree, 1 points for Strongly Disagree. The higher the total points, the higher the influence of marketing environmental factors on

the performance of Small and Medium Scale Enterprises in Kaduna State. For each environment factor variable, a mean rating is estimated by estimating the total rating and dividing this total by the total frequency. The mean rating is used to make decision concerning do not agree. But if the mean value is above 3.50, it is assumed that the respondents have agreed. The overall table of chi-square test is used to test the hypothesis which was formulated to guide this work.

The hypothesis: Marketing environmental factors do not have significant influence on the performance of Small and Medium Scale Enterprises in Kaduna State. The essence of testing this hypothesis is to provide answer to the main question of this study. 5% or 0.05 level of significance will be used. The decision rule is to accept the null hypothesis if the calculated chi-square value is less than the critical value (X_t^2) , otherwise, the null hypothesis is rejected.

4. DISCUSSION OF FINDINGS

The above study methodology only describes a sampling plan as postulated by Levy and Lemeshow (1999: Pg. 6) which says in summary that, a sampling plan is the methodology that will be used to select the sample from the population. It describes the approach that will be used to select the sample, it determines the adequate sample size, and the choice of media adopted. It also talks about the procedures (methods) for obtaining population estimates from the sample data. Observation derived from the study shows that the criterion in the use of survey design in a research work is not properly applied.

This study initially seems to be a population with similar characteristics. But the population is demographic (heterogeneous), which means that the researcher used stratified sampling technique. The data the researcher elicited, was it based on their age or productivity? So, this also made the whole work looks clumsy and lacks comprehension.

Also, the primary data generated was narrowed down to only questionnaire. In this type of research, even face-to-face interviews will suffice.

The third paragraph states the hypothesis as Marketing environmental factors do not have significant influence on Small and Medium Scale Enterprises in Kaduna State. Where is this conclusion based? The reasons is that, there is no hypothesis formulated on which the statistical chi-square value will apply.

The objective which is one of the key elements of survey instruments is not clearly spelt or well detailed. A research work should have at least four questions but the study has only two, which of course will invariably have an advance effect on the hypothesis generated if it exists at all.

The use of methodology in a research is not a mere description of concepts but the fundamental thing is how to adhere to the research protocol and the design of the study. If the researcher carefully follow the procedures and techniques outline in the research protocol will increase the chance that the results of the research will be accurate and useful to others. The validity of the project cannot be accepted by public or other researchers as true because it fails to impart any knowledge to any researcher.

5. RECOMMENDATIONS

A researcher who applies a survey design in carrying out his study will have a good result or output. The following are recommended as measures to enhance development of a worthy research-based survey design in a research undertaking: when designing a survey, it is helpful to establish a research proposal. The researcher must be sure that the focus or the understanding of the study problem is carefully examined. Since Survey design is the backbone of any research undertaking, it should have a clear focus and this of course requires good planning.

The researcher should adhere strictly to the study objectives which, must be translated into measurable factors such as the hypothesis that contribute to the focus or the research work.

The researcher should well-versed in the topic in order to arrange the research work in logical sequence during selection of either the target population or the survey population. Also, to determine the needed sample size and technique, the appropriate survey media and data analysis.

Researchers should explain their sampling techniques either as stratified or random sampling techniques for easy application and analysis.

Lastly, the use of the word 'methodology' or at times 'research design' is global, vast and incomplete without proper analysis of its methods and methodology. So, having vast knowledge of this requisite terminology will prevents piss-poor performance by a researcher.

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