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Chapter 3

Research methodology

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3.1 Introduction

This chapter provided information on the research design and method under the following headings: research design, research method and population of the study. It also provided information on the sampling size, sampling method and how they are determined. Furthermore, this chapter gave information on the instrument of the research and how they were applied in the process of data collections. Other important aspect of the methodology contained in the chapter are validity and reliability, and method of data analysis.

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3.2 Research Design

A research design describes the study's procedures, including when, from whom, and under what conditions the data could be obtained (Mugenda & Mugenda 2019). For this study, the researcher adopted the survey research design for collecting information and data that individuals report. This design is employed to explain the nature of the customer engagement techniques in green spare parts initiatives. Therefore, the study is premised on quantitative research methods. Quantitative research technique is used to qualify the effect of a systematic variation of one or more independent variables on some other dependent variables (Ajewole&Odaibo, 2009).

3.3 Population of the Study

A population is defined as a complete set of individuals, objects, or cases with some noticeable common characteristics (Mugenda and Mugenda, 2019). Population equally refers to an objective list of all individuals, objects, or cases from which a researcher can make his or her selection. The population of the study includes consumers who purchase green spare parts.

3.4 Sample Size and Sampling Technique

Sampling involves the selection of several study units from a defined study population (Babbie, 2010). Purposive sampling was adopted to ensure that only knowledgeable respondents were recruited in the study. The choice of purposive sampling is that the researcher uses his dexterity and prior understanding to choose respondents based on their speciality. Purposive sampling was used based on decisions concerning individuals to be included in a sample based upon a variety of criteria, including specialist knowledge of the research issue or capacity and willingness to participate in the research.

Sample is a subset of a population. It is the set of data collected or selected from a statistical population based on a defined procedure. One of the properties of a good sample is that it must represent all elements available in each population. The sample size of this study is calculated using the Cochran formula

$$n0=\frac{Z^2 \cdot p \cdot (1-p)}{e^2}$$

Where:

n_0 = sample size for an infinite population

Z = Z-value (the number of standard deviations from the mean corresponding to the desired confidence level).

p = estimated proportion of the population

e = desired margin of error or precision level

$$n0=\frac{1.96^2 \cdot 0.5 \cdot (1-0.5)}{0.05^2}$$

$$=\frac{3.8416 \cdot 0.5 \cdot 0.5}{}$$

0.0025

=0.9604

0.0025

=384.16

Thus, the sample size needed for this survey would be approximately 384 participants.

3.5 Data Collection Methods

Primary data was utilised for this study. The primary data was sourced by administering questionnaires to respondents. The use of questionnaire ensured anonymity, allowed for the use of standardised questions, and ensured uniform procedures. They also ensured that respondents who are difficult to approach are reached in a convenient and cost-effective manner, especially when the population is large and geographically dispersed (Mudany et al., 2021). The basic data was gathered with the aid of a questionnaire. For this study, data was collected by administering self-structured questionnaires and surveys. Each characteristic was assessed using questionnaire items. Administering of questionnaires is particularly relevant since they may cover a large number of respondents and collate information quickly. The questionnaire was broken into three sections: A, B, C. While Section A collected responses on respondents' demographic factors, Section B-C collected information regarding customer engagement techniques in green spare parts initiatives. Furthermore, the questionnaire instrument (questionnaire) was the Likest-scaled techniques of summated rating with weight allocated and it is as follows: Strongly (5), SA= Strongly disagree (4), D= disgree (3), U= Undecided (2), A=agree (1), SA= Strongly agree.

According to Formplus (2019), a Likest-scale is a common attitude scale used in educational research, where a 5 (strongly agree) indicates a positive attitude and a I (strongly disagree) indicates a negative attitude. In this case, the research volunteers were asked to rate how much they agree or disagree with the underlying traits bring measured. In this study, the items we altered to measure constructs and sub-constructs. Concerning the coding for items relating to the levels of agreements/disagreements, the positive item is, SA=1, A=2, U=3, D=4 and SD=5 while the negative item responses attract ratings from the least positive response to the most positive response that is SA=1, A=2, U=3, D=4 and SD=5. More so, they were assured that their responses would be given the confidentially it deserves and thus honesty and accurate responses

was solicited. The rationale behind providing clear instructions and assuring confidentiality information is based on the fact that this significantly reduces the likelihood of obtaining biased responses (Sekaran, 2003). The copies of questionnaires were administered with the assistance of Research Assistants who were adequately trained on how to administer the instruments as well as how to gain the co-operation of the research subjects.

3.6 Data Analysis Procedures

This study aims to examine customer engagement techniques in green spare parts initiatives. a study of Nigeria bottling company. The data extracted from the questionnaires are converted into attributes that relates to variables used for research. This study used both descriptive and inferential statistical methods to analyse demographic variables, research questions and hypothesis testing. The descriptive statistical method was used to present data with presentations of frequencies, table, mean, and standard deviation. For the inferential statistical technique, a multiple regression analysis was adopted with the aid of statistical package for science solution. This was applied so as to test the effect of the independent and its sub-variables on corresponding dependent variables. The reason for the adoption of multiple regression analysis is based on the fact that it tests the effect of the independent variable with its correspondent, the independent variable tends to measure the corresponding dependent sub-variables of the study to be tested. For the present survey, SPSS 30 was used as statistical tool to process the primary data collected from survey and also for analysing the data.