# CHAPTER THREE: METHODOLOGY

## 3.1 Introduction

This study employs a mixed methodology in which the quantitative and qualitative research techniques are mixed to attain a comprehensive understanding of customer engagement strategies in Nigeria’s FMCG sector and predictive analytics for financial optimization in this sector. It matters for this approach to capture the big picture, the main trends in consumer behavior, the driving motivators, and the context of these behaviours. One type of quantitative method that is used to collect data from a large sample and offers statistical insights on customer preferences, behavior, and engagement levels are surveys. Examples include the use of surveys to assess the success of customer retention strategies and measure the link between customer satisfaction and financial results, as has been done in some studies carried out in Nigeria’s FMCG sector (Olugbenga & Bamidele, 2024). They bring statistical insight for building predictive models that can predict customer behavior, give financial decision-making, and improve the possibility of financial optimization (Hair et al., 2020).

Qualitative methods, especially interviews, deliver extensive knowledge about consumer motivations and perceptions while providing contextual data that quantitative methods cannot produce independently. Through interviews, researchers uncover the motivational reasons behind customer actions because they reveal cultural elements and emotional influences on purchasing behaviour (George et al., 2024). The thorough nature of this approach brings great value to market research in Nigeria because the country's consumers respond strongly to cultural and economic influences. The incorporation of qualitative analysis enables FMCG corporations to create customized and performance-oriented engagement methods that combine predictive model data with relevant market context (Creswell & Creswell, 2005).

Combining these research approaches using triangulation methods strengthens the design to improve the quality of findings through valid and reliable results. The wide scope of quantitative surveys provides a broad view of consumer behavior patterns, but qualitative interviews provide rich insights that explain these behaviours, according to Tanrikulu, (2021). These research methods combine to form an effective framework that provides an in-depth understanding of the analysis of customer engagement behaviours, predictive analytics, and financial optimization in Nigeria’s FMCG market. The combined methodology enhances predictive model accuracy while guaranteeing actionable features that adapt to market conditions at the local level (Pearlson et al., 2019).

## 3.2 Research Philosophy

This study seeks to combine quantitative and qualitative methods with flexibility and a practical approach. Hence, Pragmatism is the chosen research philosophy. The use of pragmatism allows for the use of mixed methods, which would employ methods most appropriate given the situation and aims of the study (Shah & Shah, 2018). This philosophy is useful in dealing with complex social phenomena related to customer engagement strategies due to its capability to integrate both statistical analysis and qualitative insights that contribute to a holistic understanding of the research problem (Silva et al., 2018). Considering this study, pragmatism allows the use of surveys on quantitative data and interviews on qualitative data to achieve the research objective of improving customer engagement strategies in the FMCG sector of Nigeria for financial optimization.

The research objectives of improving customer engagement strategies through predictive analytics require both actionable insights from quantitative data (e.g., identifying trends) and a deeper contextual understanding of consumer motivations through qualitative methods (e.g., exploring cultural nuances). This dual focus is supported by the pragmatism that allows the predictive models to be integrated with the local market insights such that the developed strategies are empirically robust but contextually relevant (Creswell & Piano Clark, 2023). This flexibility also allows for the potential limitations in data of the Nigerian FMCG sector, given that sparse quantitative data can be triangulated with qualitative fieldwork to enhance the analysis (Oyedijo et al., 2021).

The pragmatism approach is more adaptable than positivism, which highlights its strength of rigid, quantitative data and generalized (Pearlson et al., 2019). Interpretivism will ignore the necessity of empirical data to validate predictive models (Bryman, 2016). Thus, pragmatism is the most appropriate philosophy for use in this study since it can strike a balance between the need for empirical rigor and depth of context, the attributes that are most suitable for the study of customer engagement strategies using predictive analytics (Shah & Shah, 2018)

## 3.3 Data Collection Process for Quantitative Data

### ****3.3.1 Survey Design****

The survey will be structured to collect quantitative and qualitative information from Nigerian FMCG companies about predictive analytics, financial performance indicators, and customer engagement practices. It employs closed-ended questions primarily along with open-ended questions to measure efficiency in data analysis for specific issues.

The survey plan contains different sections to maintain a structured sequence. At the beginning of the survey, the Introduction Section will detail its main goal, which involves examining predictive analytics usage in Nigeria's FMCG industry for customer strategies and their effects on financial optimization. Participating respondents will receive guidance through the introduction on the estimated duration of the survey, which should take between 10 and 15 minutes. The introduction section will contain a statement about how data confidentiality applies alongside a description of data utilization.

The first part of the survey contains Demographic Questions to acquire background information from participating companies. Questions will include:

* **"What is the size of your company?"**
  + Small, Medium, Large
* **"In which region of Nigeria is your company primarily located?"**

The second section examines the general practices and strategies that FMCG companies use to interact with their customers. Questions will include

* **"Which customer engagement strategies do you currently employ?"** (Multiple-choice: Email marketing, social media engagement, Personalized promotions, Loyalty programs, etc.)
* **"How often do you update your customer engagement strategies?"** (Likert scale from 1-5: Never, Rarely, Occasionally, Frequently, Always)

The third section evaluates predictive analytics utilization for customer engagement through metrics to determine technology implementation levels in these strategies. Sample questions will include:

* **"Do you currently use predictive analytics to enhance your customer engagement efforts?"** (Yes/No)
* **"How frequently do you use predictive analytics to forecast customer behavior?"** (Likert scale: Never, Rarely, Occasionally, Frequently, Always)
* **"Which predictive analytics tools do you use?"** (Multiple choice: IBM SPSS, SAS, Python, etc.)

Financial Performance Indicators will be the final section to understand how predictive analytics-based customer engagement solutions affect financial outcomes. Questions will include

* **"How do you measure the effectiveness of your customer engagement strategies in terms of financial performance?"** (Multiple choice: Increase in sales, Customer retention rate, Profit margin, etc.)
* **"What financial metrics are most influenced by your customer engagement strategies?"** (Likert scale: Strongly disagree to agree Strongly)

Some of the questions in the survey are made mandatory so that respondents cannot submit the survey unless they answer these questions. This method ensures that all necessary information is obtained and avoids receiving incomplete or irrelevant answers. For example, "Do you use predictive analytics in any of your customer engagement strategies currently?" To make sure that one of the key requirements in the usage of predictive analytics is captured for all respondents, (Yes/No) will be mandatory. Moreover, parts will give respondents just one alternative from a gathering of predefined decisions, for example, 'What is the size of your organization?'. It can be a selection of (Small, Medium, or Large) with only one choice. For other sections, multiple selections are allowed (see Which of the following customer engagement strategies do you currently use). (Email marketing, social media engagement, Loyalty program, etc.). The integrity of the data is maintained, and unnecessary or wasteful responses are minimized by structuring the survey in this manner.

As noted by Zlatanova-Pazheva, (2024), the questions will be carefully prepared to eliminate confusion and bias. Although limited to 25 questions, the survey will stay direct, thus preserving participant attention and reducing survey burnout. As suggested by (Hamilton et al., 2024), a preliminary survey evaluation with a small group will occur to discover any concerns regarding question precision and logical sequencing.

### 3.3.2 Sampling Method

#### 1. Sampling Strategy

Every FMCG company operating in Nigeria will have an equal opportunity to be selected through random sampling, which results in a representative sample and reduces bias while enhancing the findings' general applicability.

#### 2. Sample Size

Thirty FMCG businesses form the target sample population because researchers considered data availability alongside the study parameters and time limitations. This specific Nigerian sector makes it reasonable to work with 30 companies, but participant accessibility remains limited due to confidentiality concerns and limited resources. The objective is to collect sufficient data to spot meaningful patterns. The selected sample size contains sufficient participants to achieve a balanced representation among FMCG companies that perform predictive analytics at different levels.

#### 3. Inclusion Criteria

To ensure the relevance and accuracy of the data:

* FMCG Companies employing predictive analytics or expressing interest in it will receive selection for the study. The selection of informed companies that directly provide first-hand reports about predictive analytics together with customer engagement practices ensures accurate results.
* The research will include companies spread across different Nigerian regions, putting Abuja, Port Harcourt, and Lagos within its sampling scope to understand the local variations of predictive analytics implementation.
* Large-scale FMCG companies, as well as medium and small-sized FMCG organizations, make up the sample group for the study.

#### 4. Stratification

Suppose random sampling proves that responses differ substantially between company types (such as small versus large). In that case, the researcher should use stratified sampling by dividing the sample into distinct subgroups (for instance, company size and region) to obtain random selections from each subgroup. The research design will include methods to confirm the representation of actual variations in customer engagement and predictive analytics adoption between different company sizes and regions.

#### 5. Response Rate and Follow-Up

The survey response rate will benefit from follow-up communications that will be sent after the first round of survey distribution. The appropriate response rate for business sector online surveys generally falls between 60-70 percent. After the initial survey distribution, there will be a follow-up that functions both as a reminder and addresses any remaining uncertainties of the participants. The data collection process will end after offering an additional week for non-respondents to join.

### 3.3.3 Data Collection Process

#### 1. Survey Distribution

The survey will be administered through Google Forms online due to its ease of access, real-time data collection, and efficiency. Email invitations will be distributed to the points of distribution and will include a brief explanation of the purpose of the survey, how much time it will take to complete the survey (approximately 15 to 20 minutes), and a thank you note for participating.

The survey may be promoted through social media platforms that reach out to the Nigerian FMCG sector, such as LinkedIn and Twitter, where companies engage their customers on issues of predictive analytics, customer engagement, and so on. The survey will be conducted through both email and social media, spreading further and wider within the FMCG industry.

#### 2. Timing of Distribution

This survey will be *distributed* for a week. So that they can complete the survey, the link will be sent early in the week to increase participation. Furthermore, halfway through the distribution period, periodic reminder emails will be sent *to* encourage participation and remind companies about the survey’s significance in enhancing customer engagement strategies in Nigeria’s FMCG sector.

#### 3. Response Collection

After the initial distribution of the survey, the survey will be open for responses for two weeks. It gives respondents enough time to fill out the survey but also gives an incentive to respond quickly to keep the study on schedule. During this period, data will be stored securely for analysis once data is collected automatically within the Google Forms platform. If the survey response rate is low, the survey distribution will be extended by another week.

#### 4. Pretest and Pilot Survey

The survey questions will undergo a pretest with a small group of about 5 to 10 members of the target population. They will also give feedback on the clarity of the survey, the logic of the flow, the appropriateness of the questions, and any technical functionality issues. The insights from this pilot survey will be used to improve the final survey and make it more valid. Adjustments to question phrasing, answer options, and instructions will be made if needed.

#### 5. Data Cleaning and Validation

The survey responses require a complete validation process after data collection ends to ensure their completeness and consistency. Any responses that are incomplete or inconsistent will be flagged and either excluded or reviewed for potential follow-up. For example, some respondents may choose opposite answers to the same question, such as "How satisfied are you with our product quality?" when agreeing and disagreeing with its quality. Clarification flags variables containing conflicting responses, such as "Very satisfied" plus "Very dissatisfied". When unresponsive participants prevent data clarification, such cases will lead to the removal of information to preserve the dataset. The approached data selection method removes all unreliable data points, so the analysis contains only validated usable information.

If missing data is present, various methods will be considered. The analysis excludes responses that have substantial missing data points. To impute smaller missing values, prediction methods through information obtained from other respondents will be used. Various methods will preserve dataset completeness and reduce potential biases through their application.

All survey responses stored securely on Google Forms platform will undergo export into Excel or R to undertake cleaning and analysis procedures. Statistical analysis will begin only after resolving both inconsistent data points and outliers.

#### 6. Timeline

Week 1: Survey distribution and initial responses.

Week 2: Follow-up reminders and extended participation window.

Week 3: Response collection completion and data cleaning.

## ****3.4 Data Collection Process for Qualitative Data****

Interviews with FMCG sector experts and stakeholders will serve as the qualitative method of data collection to examine predictive analytics usage within customer engagement strategies in Nigeria’s FMCG sector. Industry experts and relevant stakeholders from the FMCG sector will be interviewed to obtain detailed information about the difficulties and advantages of predictive analytics implementation throughout this area.

### ****3.4.1 Interviewee Selection****

Purposive sampling techniques will determine the participant selection process to include experts and experienced professionals in the study. Interview participants will be selected from FMCG organizations that perform predictive analytics either currently or plan to implement this technology. The selection process includes several groups among them:

* **Senior managers** in marketing or customer engagement departments.
* **Data analysts** and **predictive analytics specialists** within FMCG companies.
* **Industry consultants** or **academics** specializing in predictive analytics applications in the FMCG sector.
* **Technology vendors** that provide predictive analytics tools to FMCG companies.

### ****3.4.2 Interview Duration and Setting****

The scheduled interviews will extend from 15 to 30 minutes allowing interviewees to share their viewpoints and experience about predictive analytics implementation. To ensure privacy and comfortability which is suitable for honest discussions for the interviews, The interviews will use virtual platforms such as Zoom or Microsoft Teams because of the combination of geographical needs and easy access. Face-to-face meetings can be organized if the situation allows, especially in major urban areas of Nigeria, to allow for a more personal discussion.

### ****3.4.3 Interview Process and Recording****

The interviews use a semi-structured format to maintain pre-planned questions but let the researcher ask additional questions when needed for more detailed exploration. There will be 10 to 15 questions structured within an interview guide.

* The **current use** of predictive analytics within the company.
* **Challenges** faced in adopting and implementing predictive analytics.
* The **impact** of predictive analytics on customer engagement and financial outcomes.
* **Opportunities** for further integration of predictive analytics.
* **Strategic recommendations** for overcoming barriers and enhancing effectiveness.

Example questions might include:

* **"What are the primary challenges your company faces in adopting predictive analytics for customer engagement?"**
* **"How has the use of predictive analytics influenced your company’s customer retention strategies?"**
* **"In your opinion, what opportunities does predictive analytics offer for improving financial performance in Nigeria's FMCG sector?"**

Interviews will be recorded by audio methods only after obtaining consent from the interviewee to capture their responses precisely for transcription and analysis purposes. The researcher will record brief notes when necessary to obtain extra clarity. Transcript generation of verbatim recordings will occur after personal identification information gets removed for the purpose of maintaining confidentiality.

## 3.5 Quantitative Data Analysis

### ****3.5.1 Analysis Techniques****

The quantitative data analysis will use regression analysis together with structural equation modelling (SEM) as primary statistical techniques. Using regression analysis will investigate the relationships between predictive analytics implementation and customer engagement approaches with their resulting financial outcomes of customer retention and sales expansion. Through this method, we can measure the extent to which financial outcome variables (such as sales revenue and customer retention rates) can be explained through customer engagement strategies and predictive analytics implementation. The application of regression analysis allows researchers to verify the hypothesis, which states that predictive analytics leads to substantial improvements in FMCG company customer retention levels.

The analysis with SEM will examine how multiple variables relate to one another simultaneously to demonstrate the complete structure between predictive analytics customer engagement practices and financial performance. SEM is advantageous for this investigation because it permits researchers to study both straight and roundabout relations between different variables affecting customer engagement results. SEM analysis will map the sequential paths linking predictive analytics to customer loyalty, which eventually generates financial returns for the company. The R software will be used to perform regression analysis and SEM because it provides both flexibility and extensive statistical packages in academic research contexts.

### ****3.5.2 Variable Types****

In this study, a combination of **categorical, ordinal,** and **continuous variables** will be analyzed.

* **Categorical variables** will include factors such as company size (small, medium, large) or region (North, South, East, West) where the FMCG companies operate.
* **Ordinal variables** will include responses from Likert scale questions, such as "How often does your company use predictive analytics?" (Never, Rarely, Occasionally, Frequently, Always).
* **Continuous variables** will include numerical data such as customer retention rates, sales revenue, or other performance metrics.

The collected variables will receive categorization like company size, regional characteristics and engagement strategies. Predictive analytics users will constitute their subgroup within the analysis as researchers analyze engagement strategy differences with non-predictive analytics companies. The classification system will facilitate a valid assessment of predictive analytics' performance results.

### ****3.5.3 Hypotheses Testing****

The primary hypothesis tested in the quantitative analysis will be:

* **H1**: "Predictive analytics significantly improves customer retention in FMCG companies." Additional hypotheses may include:
* **H2**: "There is a positive correlation between the use of predictive analytics and financial performance (sales revenue, profit margins)."
* **H3**: "Customer engagement strategies influenced by predictive analytics lead to higher levels of customer satisfaction and retention."

The study will use a p-value threshold of 0.05 to identify statistically significant results. Researchers will consider statistical significance in results when p-values fall below 0.05 since this indicates unlikely chance events between variables. The models' robustness will be checked through evaluations of RMSEA (Root Mean Square Error of Approximation) and CFI (Comparative Fit Index) fit indices in both regression analysis and SEM.

### ****3.5.4 Descriptive Statistics****

Descriptive statistics will be calculated to summarize the dataset and provide an overview of the key variables. Specific measures will include:

* **Mean** and **standard deviation** for continuous variables like customer retention rates or sales figures, which will provide insights into the central tendency and spread of the data.
* **Frequency distributions** for categorical variables like company size or region, helping to identify patterns in how companies in different regions or sizes are engaging with predictive analytics.
* **Median** will also be calculated where appropriate, particularly for ordinal variables, to understand the central tendency when the data is skewed.

These descriptive statistics will help establish a foundational understanding of the data before more complex analyses are conducted.

### 3.5.5 ****Data Interpretation****

The study analyses the relationship between predictive analytics use and customer engagement strategies through its quantitative results to interpret financial performance outcomes. The predictive analytics usage demonstrates significant statistical relationships with higher customer retention rates according to the regression analysis results. This evidence will be used to demonstrates predictive analytics functions as an essential factor that boosts customer engagement alongside FMCG financial achievements.

The analysis will translate research-based conclusions to the study's main objectives and hypothesis then deliver applicable knowledge to FMCG businesses about predictive analytics optimization for improved customer relationships and financial performance.

## 3.6 Qualitative Data Analysis

### ****3.6.1 Analysis Method****

Qualitative data analysis will use thematic analysis as the method. This method enables the detection of patterns (themes) in interview data, analyzes their contents, and prepares reports. Also, the thematic analysis method will ensure a deep analysis of interview data about adopters’ perspectives on predictive analytics use for customer engagement within Nigeria’s FMCG sector.

The initial phase of coding begins with open coding from preliminary categories through repeated concepts and ideas in the interview responses. During axial coding, the relationships between initial categories will be established as part of theme refinement. The analytical process will lead to a better comprehension of how predictive analytics impacts both customer engagement methods and financial performance in Nigeria's FMCG sector. To ensure the **reliability** and **validity** of the qualitative findings, several steps will be taken:

* **Peer debriefing**: The data analysis will be reviewed by a colleague or research assistant with expertise in qualitative research to discuss interpretations and ensure consistency.
* **Member checking**: Selected interviewees will be asked to review the themes and interpretations to ensure that the researcher’s understanding aligns with their intended meanings and experiences.

### ****3.6.2 Interview Data****

A total of 10 to 15 interviews will be analyzed, featuring industry experts and key stakeholders who work for FMCG companies in Nigeria and understand predictive analytics in customer engagement.

Every detail from the interviews will be recorded through verbatim transcription. The method allows accurate analysis of spoken statements to be maintained. Manual transcription methods will guarantee full attention to each participant's responses. Transcription software will be used to boost efficiency although he will maintain strict adherence to the authentic interview data during the transcription process.

Manual coding techniques will serve to analyze the data. The interview transcript will be examined, and meaningful words or phrases as codes that match relevant research themes or concepts will be extracted. During the analysis, codes can be added or modified through an iterative process.

### ****3.6.3 Theme Identification****

A deductive approach will be used to derive themes by starting with pre-established themes based on the interview questions, including challenges, opportunities, benefits, and financial performance effects. The first themes will be modified throughout the analysis when new insights develop from the data.

Key themes that will be explored include:

* **Challenges in adopting predictive analytics**: Identifying obstacles such as resource constraints, lack of skills, or resistance to change within the company.
* **Opportunities created by predictive analytics**: Understanding how predictive analytics can drive customer engagement, improve loyalty, and enhance sales performance.
* **Perceived benefits of using predictive analytics**: Examining how FMCG companies perceive improvements in operational efficiency, decision-making, and customer satisfaction.
* **Impact on financial performance**: Investigating how the integration of predictive analytics affects key financial indicators such as sales revenue, profit margins, or customer retention.

### ****3.6.4 Contextual Interpretation****

Interpretation of qualitative insights will be made against the backdrop of customer engagement in the Nigeria FMCG sector. To understand the data, it will be critical to understand how cultural, economic, and regional factors shape the adoption and impact of predictive analytics. To give a global reading of the findings, interview data will be connected to the broader literature on predictive analytics and customer engagement.

Quotes from the interviews will be used directly to highlight the important points and main themes. For example, a participant’s statement about the challenge of adapting to predictive analytics could be provide an insightful illustration of a typical barrier and challenges faced by FMCG companies

### ****3.6.5 Triangulation****

To improve the validity of the findings, the data is triangulated by combining qualitative data from interviews with quantitative data from the survey. This integration will validate the findings; what is seen in the survey data can be further explored in the qualitative data interviews and vice versa. The study will add robustness to its conclusions by triangulating data from multiple sources and enhancing its understanding of the research problem.

## 3.7 Ethical Consideration

Confidentiality and anonymity will be maintained in both qualitative and quantitative data collection and analysis to protect participants' privacy. During the qualitative phase, all interviewees will be informed about the study’s purpose, and they will give their informed consent before they are interviewed. Confidentiality assurances will be made that no identifying information will be included in transcriptions or final reports and that no identifying information about participants will be included. They will also have the right to withdraw from the study at any time without consequence. The nature of research, that participation is voluntary, and how data will be used will be explained in an informed consent form.

Ethical standards will also be followed for the quantitative data collection. The purpose of the study will be explained to the survey participants, and they will be assured that the responses will be anonymized and treated confidentially. The survey will be voluntary, and participants will enjoy the right to withdraw at any stage without penalty. The responses will be stored securely and only available to authorized personnel. Without a response, any incomplete or inconsistent one will be removed. In the qualitative phase of the study, there are no significant ethical risks as the study involves no physical harm; in the quantitative part of the study, no serious ethical risks are anticipated.

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