**Project Documentation: Nana Supermarket Sales Dataset Analysis**

BACK STORY

In the past 2 years, the economy in Nigeria has suffered some setbacks, in order to preserve and ensure maintenance and growth of the business – NANA’s Supermarket, my services were employed. I had gone over the sales data, to understand the business and generate insights and some business development recommendations.

**Project Overview**

The objective of this project is to perform an in-depth analysis of the supermarket sales dataset using Microsoft Excel. The dataset contains key information about sales transactions across various product categories, customer demographics, and locations. By leveraging Excel's powerful data analysis and visualization tools, the aim is to uncover actionable insights to assist in making data-driven decisions.

**Problem Statement**

The company seeks to improve its operational efficiency and customer experience by understanding sales trends, customer preferences, and performance across branches. Key challenges include:

* Identifying best-selling product lines and their performance across branches.
* Analysing customer purchasing patterns by demographics and payment methods.
* Evaluating branch performance and gross income contributions.
* Assessing customer satisfaction and its correlation with sales metrics.

**Dataset Summary**

* **Source:** The Data Immersed
* **Period Covered:** Jan 2019 – March 2019.
* **Frequency:** Hourly as purchases was made.
* **Size:** Contained 1000 rows and 17 columns.
* **Format:** In xslx format, Excel.

**Data Description**

The dataset contains the following columns:

| **Column Name** | **Description** |
| --- | --- |
| **Invoice ID** | Unique identifier for each sales transaction. |
| **Branch** | Branch of the supermarket (A, B, or C). |
| **City** | Location of the supermarket branch. |
| **Customer Type** | Member (1) or Normal (0). |
| **Gender** | Customer gender (Male or Female). |
| **Product Line** | Categories of products purchased. |
| **Unit Price** | Price per unit of product ($). |
| **Quantity** | Number of products purchased. |
| **Tax** | 5% tax applied on purchases. |
| **Total** | Total price, including tax. |
| **Date** | Date of purchase (from January to March 2019). |
| **Time** | Time of purchase (between 10 AM and 9 PM). |
| **Payment** | Payment method used (Cash, Credit Card, Ewallet). |
| **COGS** | Cost of Goods Sold. |
| **Gross Margin Percentage** | Gross margin percentage. |
| **Gross Income** | Income from the sale. |
| **Rating** | Customer satisfaction rating (1 to 10). |

**Objectives**

1. **Branch Performance Analysis:**
   * Determine the branch with the highest sales and gross income.
   * Identify the branch with the highest average customer satisfaction ratings.
2. **Product Line Analysis:**
   * Rank product lines by total sales and gross income.
   * Analyse the average rating for each product line to assess customer satisfaction.
3. **Customer Demographics:**
   * Analyse purchase patterns based on gender and customer type (Member vs. Normal).
   * Examine sales trends over time (by day, month, and hour).
   * Identify peak shopping times and days for each branch.
   * Determine the preferred product lines for different customer demographics.
4. **Payment Method Analysis:**
   * Identify the most popular payment method and its impact on sales.
5. **Customer Satisfaction:**
   * Assess the relationship between customer ratings and sales metrics (e.g., Total Sales, Quantity).

**Data Analysis Tools**

Microsoft Excel will be the primary tool used for:

* **Data Cleaning:** Removing duplicates, correcting inconsistencies, and handling missing values.
* **Data Analysis:** Using formulas, PivotTables, and Pivot Charts for exploration.
* **Visualization:** Creating charts and graphs for visual representation of insights.

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**Detailed Steps For Implementation**

**Step 1: Data Cleaning**

* Remove duplicate records.
* Check for missing values and fill or drop them as appropriate.
* Standardize column names and formats (e.g., dates and times).
* Change data types of certain columns to the most appropriate type and rounded off to 2 decimal places to ensure neat visibility
* Expand the date column to give a month, date and time columns
* Create new columns for the Gender column, to give M-Male and FM-Female; do same for the Customer type column

**Step 2: Data Analysis**

1. **Branch Performance:**
   * Use PivotTables to calculate total sales, gross income, and average ratings by branch.
2. **Product Line Analysis:**
   * Analyse total sales and gross income for each product line.
   * Use PivotTables to assess average ratings for each product category.
3. **Customer Demographics:**
   * Segment sales data by gender and customer type.
   * Explore product preferences within each demographic group.
4. **Payment Method Analysis:**
   * Count the number of transactions for each payment method.
   * Analyse the total sales generated by each method.
5. **Temporal Analysis:**
   * Create time-based Pivot Charts to visualize sales trends.
   * Identify peak sales hours and days for each branch.
6. **Customer Satisfaction:**
   * Correlate ratings with total sales and product lines.
   * Identify factors contributing to high customer satisfaction.

**Step 3: Visualization**

* Use Excel charts and conditional formatting to highlight key patterns.
* Create dashboards summarizing key metrics.

**Step 4: Key Insights Summary**

* Documented insights such as the most profitable branches, best-selling product lines, and preferred payment methods.

**Step 5: Presentation**

* Summarizeded findings in a PowerPoint presentation with visuals to support recommendations.

**Recommendations for the Supermarket**

Based on the key focus areas identified for analysis, here are specific recommendations for the supermarket to help make informed decisions that enhance inventory management, improve customer satisfaction, and drive overall sales growth:

1. Impact of Membership Cards

Comparing the spending patterns of customers with and without membership cards. We determined that membership cardholders had equal transaction frequencies to non-card membership customers.

-Recommendation: Loyalty Program Enhancements: For membership cards to positively impact sales, consider enhancing the loyalty program by offering exclusive discounts, rewards points, or personalized offers to encourage more customers to sign up and increase their shopping frequency.

2. Identifying Monthly Sales Performance:

- Monthly Sales Analysis: Yangon branch was the best performing branch in March but also the least performing in February. Mandalay branch has maintained a steady sales performance in the past 3 months while being the best performing branch for February. Naypyitaw was the best performing branch in January and least performing branch in March.

- Targeted Promotions: Using the insights from monthly sales performance we need to plan targeted promotions and marketing campaigns across all branches to boost sales. Additionally, ensure adequate stock levels to meet increased demand.

3. Determining Total Revenue and Opportunities to Increase Sales:

- Revenue Analysis: Naypyitaw generated the most revenue in Q1, while the other two branches generated approximately the same revenue via their gross income.

- Sales Opportunities: Identified that the 3 branches are underperforming and need to investigate the reasons for low sales. Consider strategies such as bundling, discounts, or better placement within the store to improve their sales. Additionally, cut back on costs of goods, procurement and other miscellaneous expenses while also increasing profit from 5% to 8% to increase overall revenue.

4. Identifying Consumer and Gender to Target for Specific Product Lines:

- Customer Segmentation: Analyzed purchase data to segment customers based on demographics such as gender. Identified certain product lines popular among different segments. Fashion Accessories was the most purchased product line amongst female customers while Health and Beauty was the most purchased amongst male customers. Sports and Travel was the least purchased product line among male customers while Health and Beauty was the least among female customers

- Targeted Marketing: Develop targeted marketing campaigns for the specific product lines based on the preferences of different customer segments. For example, Fashion Accessories product line is popular among female customers, design promotions and advertisements that appeal to this demographic.

5. Preferred Day and Time of the Week with Most Sales:

- Sales Pattern Analysis: Identified the days and times with the highest sales volume across the various branches. This can help in optimizing store operations, staffing, and promotional activities. With Saturday and Tuesday being the busiest across the branches while Monday is the least busy day of the week

- Optimized Promotions: Schedule promotions and special events during peak sales periods to maximize customer engagement and sales. For example, offering discounts on weekends if they are identified as high-sales days. Scheduling lesser staff on Mondays and more staffs during peak days.

6. Preferred Means of Payment Amongst Customers:

- Payment Method Analysis: Review transaction data to determine the most popular payment methods among customers (i.e. cash, credit card, E-wallet). Among the 3 branches, Yangon has done the most effort to implement the cashless policy.

- Payment Expansion: Ensure that the supermarket supports a wide range of payment methods to ensure a seamless payment experience to customer preferences. Promote the availability of preferred payment options to enhance the shopping experience and convenience for customers

**Recommendations for Future Analysis**

* Conduct sentiment analysis on customer feedback if available.
* Explore cross-selling opportunities among product lines.
* Perform a profitability analysis incorporating operating costs per branch.