Pizza Place Sales

Background

The dataset contains sales information from a pizza place over the span of a year. It includes details about order timings, pizza types, sizes, quantities, prices, and ingredients. Analyzing this data offers an opportunity to understand customer preferences, identify peak sales periods, and optimize menu offerings to enhance business performance.

Problem Statement

The pizza place seeks to improve its operational efficiency, customer satisfaction, and profitability by leveraging its sales data. Key challenges include:

1. Identifying daily customer traffic and peak hours for better resource allocation.
2. Understanding pizza preferences to enhance the menu.
3. Analyzing revenue trends and detecting seasonality in sales.
4. Determining underperforming menu items and formulating effective promotional strategies.

Data Overview

The dataset consists of **48,621 rows and 11 columns**, providing detailed insights into the sales and operations of a pizza place. Below is a summary of the dataset's structure:

Columns Overview:

1. **Order Details ID**:
    - Unique identifier for each order detail record.
2. **Order ID**:
    - Identifier linking individual pizza orders to a single transaction.
3. **Date**:
    - The specific date and time of each order, crucial for identifying trends such as peak hours and seasonal variations.
4. **Pizza ID**:
    - Unique identifier for each pizza type.
5. **Pizza Type ID**:
    - Categorical identifier linking pizzas to specific types (e.g., meat, vegetarian).
6. **Size**:
    - Indicates the pizza size (e.g., Small, Medium, Large), impacting revenue and customer preference analysis.
7. **Quantity**:
    - Number of pizzas ordered per entry, useful for understanding order size trends.
8. **Price**:
    - Cost per pizza, enabling revenue calculation and profitability analysis.
9. **Name**:
    - The specific name of each pizza aids in bestseller identification.
10. **Category**:
    - Broad classification of pizza types, such as vegetarian or meat-based.
11. **Ingredients**:
    - A list of components for each pizza is useful for identifying customer preferences or developing new offerings.

Methodology

1. **Data Sources**

- Source: https://www.kaggle.com/datasets/mysarahmadbhat/pizza-place-sales

- **Data Dimensions:** 48,621 rows and 11 columns, containing details like order dates, pizza types, sizes, and prices.

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2. **Data Preparation and Wrangling**
   - **Data Understanding:**
     - Review the dataset's structure, attributes, and patterns.
     - Identify key columns relevant to analysis, such as date, pizza type, size, and price.
   - **Data Cleaning:**
     - Address missing values (e.g., filling in or removing missing data).
     - Resolve inconsistencies in data (e.g., standardizing pizza names and sizes).
     - Remove duplicate records and outliers.
   - **Data Transformation:**
     - Extract time-based insights (e.g., day, month, hour) from the date column.
     - Normalize and aggregate data for trend analysis (e.g., monthly revenue).

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3. **Data Merging and Manipulation**
   - **Joining Related Data:**
     - Combine multiple datasets if available (e.g., ingredient details with sales data).
   - **Calculating Metrics:**
     - Compute derived metrics like total revenue per order, average order size, and revenue by pizza type.

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4. **Data Analysis**
   - **Behavioral Analysis:**
     - Identify peak order hours and daily customer trends.
     - Analyze order quantities to determine average pizzas per order.
   - **Revenue Analysis:**
     - Calculate total yearly revenue and monthly breakdowns.
     - Detect seasonal trends in sales.
   - **Product Performance:**
     - Identify bestsellers and underperforming pizzas.
     - Evaluate ingredient usage patterns for menu optimization.

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5. Data Visualization
   - **Utilize tools like Power BI, Tableau, or Excel to create dynamic and insightful visualizations.**
     - **Line Charts:** For tracking revenue trends and peak hours.
     - **Bar Charts:** To compare pizza performance across categories.
     - **Heatmaps:** For visualizing peak hours and seasonal trends.
     - **Pie Charts:** To show revenue contributions by pizza type or size.

Technical Processes

- Use pivot tables for summarizing data.
- Calculate averages, variances, and growth rates.
- Create charts and graphs for visual representation.
- Apply filters and sorting for specific analyses.

- Use functions like Count and Sum IF for data aggregation.

Key Findings

1. **Customer Behavior**
   - **Peak Hours:**
     - The busiest periods for orders are 12 PM to 1 PM and 5 PM to 6 PM.
   - **Daily Customer Count:**
     - An average of 60 customers visit daily.

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2. **Pizza Preferences**
   - **Order Size:**
     - The average number of pizzas per order is 3.
   - **Best-Selling Pizza:**
     - The top-selling pizza is Big_Meat_S, indicating a preference for meat-heavy options.

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3. Revenue Analysis
   - **Total Revenue:**
     - The total revenue generated over the year is $801,944.7.
   - **Seasonality:**
     - Sales are highest during the Spring season, suggesting a seasonal preference.

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4. **Menu Optimization and Promotions**
   - **Low-Sales Items:**
     - The_Greek_Xxl pizza recorded the lowest sales, indicating it may not resonate with customers.
   - **Promotion Opportunities:**
     - **Combo Deals:** Introducing combo offers during peak hours could increase order sizes.
     - **Seasonal Discounts:** Offering discounts in the spring season can further boost sales.

Recommended Analysis

1. How many customers do we have each day? Are there any peak hours?
2. How many pizzas are typically in order? Do we have any bestsellers?
3. How much money did we make this year? Can we identify any seasonality in the sales?
4. Are there any pizzas we should take off the menu, or any promotions we could leverage?

Conclusion

The analysis of the pizza place's sales data reveals valuable insights into customer behavior, pizza preferences, and revenue trends. Peak hours, popular pizza choices, and seasonal revenue patterns provide a clear understanding of customer demands. By optimizing the menu, introducing targeted promotions, and adjusting operations during peak times, the pizza place can improve profitability and enhance customer satisfaction. The recommended strategies for menu optimization and promotional offers are expected to drive sales and increase efficiency, leading to overall business growth.

Project Owner

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