STRATEGIC DECISION-MAKING USING POWER-BI

REPORT SUBMISSION

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1. Problem Statement

Our pizza business is looking to optimize its sales and operational efficiency. We need a comprehensive dashboard to analyze key metrics and identify areas for improvement. This dashboard should provide insights into sales trends, customer behavior, and product performance to help us make data-driven decisions.

Objective of the Power BI Dashboard

1. **Identify peak sales periods:** Understand the busiest days and months to optimize staffing and inventory levels.
2. **Analyze customer behavior:** Gain insights into average order value, total orders, and pizzas per order to tailor marketing strategies and promotions.
3. **Evaluate product performance:** Determine the best-selling pizza categories and sizes to refine the menu and promotional offers.
4. **Monitor overall sales performance:** Track total revenue, pizzas sold, and total orders to assess business health and identify potential growth areas.

Expected Outcomes

1. Identifying Peak Sales Periods:

- **Busiest Days:** Pinpoint the days of the week with the highest sales volumes to optimize staffing schedules and inventory levels.
- **Peak Months:** Identify the months with the strongest sales to plan marketing campaigns, promotions, and seasonal offerings.

2. Analyzing Customer Behavior:

- **Average Order Value:** Understand the typical spending per order to tailor promotions and upselling strategies.
- **Total Orders:** Track the overall number of orders to assess customer engagement and loyalty.
- **Pizzas per Order:** Analyze the average number of pizzas per order to identify potential cross-selling opportunities.

3. Evaluating Product Performance:

- **Best-Selling Categories:** Determine the most popular pizza categories to focus on marketing and promotions.
- **Popular Sizes:** Identify the preferred pizza sizes to adjust inventory and pricing strategies.

4. Monitoring Overall Sales Performance:

- **Total Revenue:** Track the overall sales revenue to assess business health and growth.
- **Pizzas Sold:** Monitor the total number of pizzas sold to gauge product demand and popularity.
- **Total Orders:** Analyze the total number of orders to understand customer frequency and loyalty.

Decision-Making Insights:

- **Staffing Optimization:** Adjust staffing levels to match peak demand periods.
- **Inventory Management:** Optimize inventory levels to avoid stockouts and reduce waste.
- **Marketing and Promotions:** Develop targeted marketing campaigns and promotions to drive sales.
- **Menu Engineering:** Refine the menu by highlighting popular items and introducing new offerings.
- **Pricing Strategies:** Implement effective pricing strategies to maximize revenue.

By leveraging the insights gained from this dashboard, the pizza business can make data-driven decisions to improve operational efficiency, enhance customer satisfaction, and ultimately boost sales and profitability.

2. DATA REQUIREMENT

pizza_	order_	pizza_name_id	quantit	order_date	order_time	unit_price	total_price	pizza_size	pizza_category	pizza_ingredients	pizza_name
1	1	hawaiian_m	1	01-01-2015	11:38:36	13.25	13.25	M	Classic	Sliced Ham, Pineapple, Mozzarella Cheese	The Hawaiian Pizza
2	2	classic_dlx_m	1	01-01-2015	11:57:40	16	16	M	Classic	Pepperoni, Mushrooms, Red Onions, Red Peppers, Bacon	The Classic Deluxe Pizza
3	2	five_cheese_l	1	01-01-2015	11:57:40	18.5	18.5	L	Veggie	arella Cheese, Provolone Cheese, Smoked Gouda Cheese, Romano Cheese, Blue Cheese, (	The Five Cheese Pizza
4	2	ital_supr_l	1	01-01-2015	11:57:40	20.75	20.75	L	Supreme	Calabrese Salami, Capocollo, Tomatoes, Red Onions, Green Olives, Garlic	The Italian Supreme Pizza
5	2	mexicana_m	1	01-01-2015	11:57:40	16	16	M	Veggie	omatoes, Red Peppers, Jalapeno Peppers, Red Onions, Cilantro, Corn, Chipotle Sauce, Garl	The Mexicana Pizza
6	2	thai_ckn_l	1	01-01-2015	11:57:40	20.75	20.75	L	Chicken	Chicken, Pineapple, Tomatoes, Red Peppers, Thai Sweet Chilli Sauce	The Thai Chicken Pizza
7	3	ital_supr_m	1	01-01-2015	12:12:28	16.5	16.5	M	Supreme	Calabrese Salami, Capocollo, Tomatoes, Red Onions, Green Olives, Garlic	The Italian Supreme Pizza
8	3	prsc_argla_l	1	01-01-2015	12:12:28	20.75	20.75	L	Supreme	Prosciutto di San Daniele, Arugula, Mozzarella Cheese	The Prosciutto and Arugula Pizza
9	4	ital_supr_m	1	01-01-2015	12:16:31	16.5	16.5	M	Supreme	Calabrese Salami, Capocollo, Tomatoes, Red Onions, Green Olives, Garlic	The Italian Supreme Pizza
10	5	ital_supr_m	1	01-01-2015	12:21:30	16.5	16.5	M	Supreme	Calabrese Salami, Capocollo, Tomatoes, Red Onions, Green Olives, Garlic	The Italian Supreme Pizza
11	6	bbq_ckn_s	1	01-01-2015	12:29:36	12.75	12.75	S	Chicken	Barbecued Chicken, Red Peppers, Green Peppers, Tomatoes, Red Onions, Barbecue Sauce	The Barbecue Chicken Pizza
12	6	the_greek_s	1	01-01-2015	12:29:36	12	12	S	Classic	Kalamata Olives, Feta Cheese, Tomatoes, Garlic, Beef Chuck Roast, Red Onions	The Greek Pizza

Source: Kaggle Dataset (pizza_sales.csv)

To execute the analysis, the following columns are required:

1. **Order ID:** A unique identifier for each order.
2. **Order Date and Time:** Timestamp of the order.
3. **Customer ID:** Unique identifier for each customer.
4. **Pizza Name:** Name of the pizza ordered.
5. **Pizza Size:** Size of the pizza (small, medium, large).
6. **Pizza Category:** Category of the pizza (e.g., classic, veggie, supreme).
7. **Quantity:** Number of pizzas ordered.
8. **Unit Price:** Price per pizza.
9. **Total Price:** Total price of the order.
10. **Ingredients:** List of ingredients used in the pizza.

3. Data Collection

Primary Data Collection:

- **Surveys and Questionnaires:** Direct questioning of respondents.
- **Interviews:** In-depth conversations with individuals or groups.
- **Observations:** Watching and recording behaviors.
- **Experiments:** Controlled tests to gather data.

Secondary Data Collection:

- **Public Databases:** Accessing existing data from government or research sources.
- **Web Scraping:** Extracting data from websites.
- **API Access:** Retrieving data from online services.

4. Data Validation

Purpose: Ensure data accuracy, consistency, and reliability for analysis by identifying and correcting errors or anomalies.

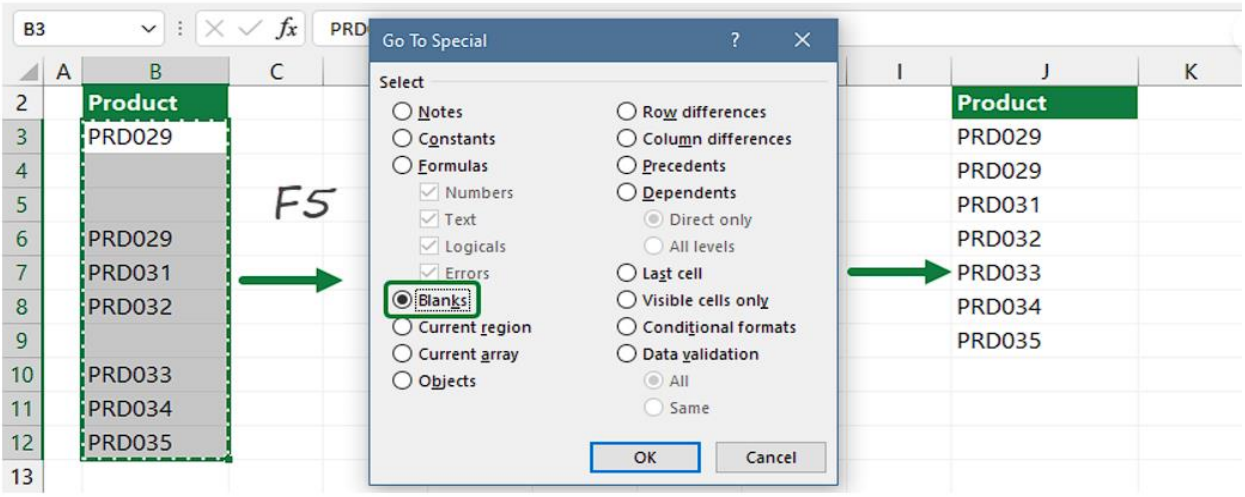

Figure 1, Data Cleaning, https://exceldashboardschool.com/15-ways-to-clean-data-in-excel

Steps

1. **Validate Column Headers**:
    - Confirm headers match the expected schema.
    - Fix missing, extra, or misnamed columns.
2. **Check for Missing Data**:
    - Highlight blank cells.
    - Handle missing values (e.g., impute or remove rows).
3. **Data Type Validation**:
    - Ensure numeric columns (e.g., "Sales") contain only numbers.
    - Check categorical columns for consistent entries.

4. **Check for Duplicates**:
    - Remove duplicate rows to retain unique records.
5. **Validate Numerical Ranges**:
    - Identify outliers in "Sales" and "Item Visibility."
    - Verify reasonable min, max, and average values.
6. **Ensure Categorical Consistency**:
    - Standardize categories (e.g., "Low Fat" and "LF").
7. **Cross-Check Relationships**:
    - Verify logical links (e.g., "Outlet Type" matches "Outlet Identifier").
8. **Data Completeness**:
    - Confirm the dataset covers all expected records and timeframes.
9. **Document Validation**:
    - Log all cleaning actions and detected issues.
10. **Test Final Dataset**:
    - Create test summaries to verify data readiness.

5. Data Cleaning

Purpose: Ensure the dataset is accurate, consistent, and ready for analysis by eliminating errors and irrelevant information.

Data Cleaning:

- **Remove duplicates:** Identify and remove any duplicate records.
- **Handle missing values:** Decide on appropriate strategies to handle missing data (e.g., imputation, deletion).
- **Correct inconsistencies:** Fix any errors or inconsistencies in the data, such as incorrect dates or misspelled product names.

6. TOOLS

Tools to be Used for Analysis and Visualization:

1. **Power BI:** For creating interactive dashboards and visualizations.
2. **Microsoft Excel:** For data cleaning, validation, and basic exploratory analysis.

7. DASHBOARD

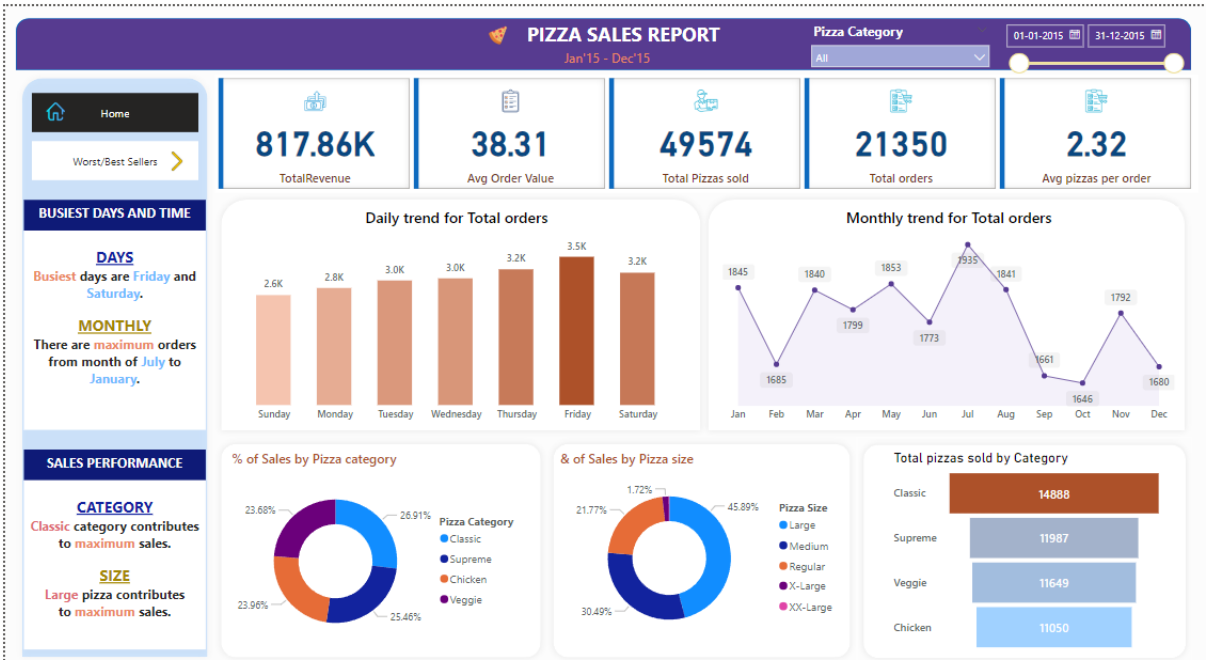

Figure 2, Demo Pizza Sales Report

Key Components of the Dashboard:

A well-designed pizza sales dashboard should provide a clear and concise overview of key performance indicators (KPIs) and trends. Here are some essential components:

1. Sales Metrics:

- Total Revenue: Overall sales generated.
- Average Order Value: Average amount spent per order.
- Total Orders: Number of orders placed.
- Pizzas Sold: Total number of pizzas sold.

2. Product Performance:

- Best-Selling Pizzas: Top-performing pizzas based on sales volume or revenue.
- Popular Toppings: Most frequently ordered toppings.
- Pizza Category Performance: Sales performance by pizza category (e.g., classic, veggie, supreme).
- Pizza Size Sales: Sales distribution by pizza size (small, medium, large).

3. Customer Insights:

- Customer Segmentation: Analysis of customer demographics and preferences.
- Customer Loyalty: Tracking repeat customers and their spending habits.

- Customer Feedback Analysis: Insights from customer reviews and surveys.

4. Operational Metrics:

- Order Fulfillment Time: Average time taken to fulfill orders.
- Delivery Time: Average delivery time for orders.
- Labor Costs: Analysis of labor costs and productivity.
- Inventory Management: Tracking inventory levels and usage.

5. Visualizations:

- Line Charts: To track sales trends over time.
- Bar Charts: To compare sales across different categories or time periods.
- Pie Charts: To visualize the distribution of sales by category or size.
- Maps: To analyze geographical sales patterns.

6. Interactive Features:

- Drill-Down Capabilities: To explore data at a more granular level.
- Filtering Options: To segment data based on specific criteria.
- Customizable Dashboards: To tailor the dashboard to specific user needs.

By incorporating these components, a pizza sales dashboard can provide valuable insights to help businesses make informed decisions, optimize operations, and improve overall performance.

8. STORYTELLING

Storytelling Your Pizza Sales Dashboard: A Narrative Approach

A well-crafted narrative can breathe life into your data and make it more engaging and impactful. Here's a storytelling approach to present your pizza sales dashboard to your business:

1. Set the Stage:

- **Hook:** Begin with a captivating question or statement, like "Are we truly understanding our customers' cravings?" or "Is our menu maximizing profits?"
- **Context:** Briefly explain the business's goals and challenges.
- **Problem Statement:** Clearly articulate the specific problem the dashboard aims to solve, such as declining sales, low customer satisfaction, or inefficient operations.

2. Unveil the Solution:

- **Introduce the Dashboard:** Highlight the key features and benefits of the dashboard, emphasizing how it provides actionable insights.
- **Walkthrough the Metrics:**

    - **Sales Performance:** Discuss the overall sales trend, peak sales periods, and revenue growth.
    - **Product Performance:** Highlight the best-selling pizzas, popular toppings, and underperforming items.
    - **Customer Insights:** Share insights into customer preferences, loyalty, and feedback.
    - **Operational Efficiency:** Analyze order fulfillment times, delivery times, and labor costs.

3. Tell a Story with Data:

- **Highlight Success Stories:** Showcase instances where data-driven decisions led to positive outcomes, such as increased sales or improved customer satisfaction.
- **Identify Areas for Improvement:** Discuss opportunities to optimize operations, enhance marketing strategies, or refine the menu.
- **Uncover Hidden Trends:** Use data to uncover unexpected patterns or trends that might inform future business strategies.

4. Call to Action:

- **Encourage Data-Driven Decision Making:** Emphasize the importance of using data to guide business decisions.
- **Suggest Next Steps:** Recommend specific actions based on the insights from the dashboard, such as launching a new pizza, adjusting pricing, or improving customer service.
- **Set Goals and KPIs:** Establish clear goals and key performance indicators to track progress and measure success.

Example Narrative:

For years, we've been serving delicious pizzas, but have we truly been serving what our customers crave? Our new sales dashboard reveals surprising insights. It shows that while our classic pizzas are steady sellers, our innovative creations are driving growth. By focusing on these trends, we can tailor our menu to delight our customers and boost our bottom line. Let's use this data to take our pizza business to new heights.

Remember:

- **Keep it Simple:** Avoid overwhelming your audience with too much data. Focus on the key takeaways and actionable insights.
- **Visualize Effectively:** Use clear and concise visualizations to communicate complex information.
- **Practice Your Delivery:** Rehearse your presentation to ensure a smooth and engaging delivery.
- **Be Prepared to Answer Questions:** Anticipate questions and be ready to provide additional details or insights.

By following these storytelling principles, you can effectively communicate the value of your pizza sales dashboard and inspire data-driven decision-making within your organization.