🍕 *Pizza Sales Analysis Dashboard*

(Power BI)

✴️ Project Overview

This project presents an end-to-end Pizza Sales & Operational Intelligence Dashboard built using Power BI to analyze product performance, revenue distribution, and kitchen operational efficiency.

The objective was to design a clean relational data model, implement robust DAX measures, and deliver executive-ready insights connecting sales demand with preparation time analysis.

The dashboard integrates financial KPIs with operational metrics to simulate a real-world restaurant performance monitoring system.

🎯 Business Objectives

- ★ Measure overall Revenue Performance
- ★ Identify Top Revenue-Generating Pizzas
- ★ Analyze Product Category & Size Contribution
- ★ Detect Peak Demand Hours
- ★ Evaluate Average Preparation Time
- ★ Identify Operational Pressure Windows
- ★ Design a professional multi-page interactive dashboard

📂 Dataset Description

The dataset consists of the following tables:

Table	Description
tab_orders	Order-level data (order_id, date, time)
tab_order_details	Line-level order quantity per pizza
tab_pizzas	Pizza attributes (name, category, size, price)
tab_operations	Kitchen preparation start & end time

🧱 Data Model Design

The model follows a clean relational structure:

```
                    tab_orders
                        |

        |                                    |
 tab_order_details                    tab_operations
        |
    tab_pizzas
```

- ❖ order_id connects orders, order details, and operations
- ❖ pizza_id connects order details to pizzas
- ❖ Single-direction relationships used
- ❖ No ambiguous or bidirectional filters
- ❖ Proper aggregation context maintained

This structure ensures accurate revenue calculation and clean filter propagation across visuals.

🔢 Key DAX Measures Implemented

Core Sales KPIs :-

- ★ Total Revenue
- ★ Total Orders
- ★ Total Quantity Sold
- ★ Average Order Value (AOV)

Product Intelligence Measures :-

- ★ Revenue by Category
- ★ Revenue by Size
- ★ Top N Revenue Ranking
- ★ Top N Quantity Ranking

Operational Metrics :-

- ★ Prep Duration (Calculated Column)
- ★ Average Prep Time
- ★ Orders by Hour
- ★ Revenue by Hour
- ★ Peak Hour Detection

Dynamic UX Measures

```
Category Title Color =
VAR SelectedCat =
    SELECTEDVALUE(tab_pizzas[pizza_category])
RETURN
SWITCH(
    TRUE(),
    ISBLANK(SelectedCat), "#333333",      -- Neutral for All Categories
    SelectedCat = "Classic", "#6b2328",
    SelectedCat = "Chicken", "#6d5a00",
    SelectedCat = "Spicy", "#3a2761",
    SelectedCat = "Veggie", "#702254",
    SelectedCat = "Supreme", "#36003e",
    "#1D3557"  -- Default fallback
)
```

```
Selected Category =
SELECTEDVALUE(tab_pizzas[pizza_category], "All Categories")
```

```
Avg Prep Time =
AVERAGEX(
    tab_operations,
    DATEDIFF(
        tab_operations[prep_start_time],
        tab_operations[prep_end_time],
        MINUTE
    )
)
```

```
Total Revenue =
SUMX(
    tab_order_details,
    tab_order_details[quantity] *
    RELATED(tab_pizzas[price])
)
```

```
Lowest/Peak Hour =
MAXX(
    TOPN(
        1,
        SUMMARIZE(
            tab_orders,
            tab_orders[Order Hour],
            "OrderCount", [Total Orders]
        ),
        [OrderCount],
        ASC / DESC -- Asc for Lowest Hour and Desc for Peak Hour
    ),
    tab_orders[Order Hour]
)
```

This ensured:

- ❖ Selected Category (Dynamic Title)
- ❖ Category-based Conditional Formatting
- ❖ Filter-Sensitive KPI Calculations
- ❖ All measures were built with proper aggregation logic to avoid row-context errors and ensure KPI integrity.

📈 Dashboard Pages

1️⃣ Executive Overview

- ❖ Total Revenue
- ❖ Total Orders
- ❖ Total Quantity
- ❖ Average Order Value
- ❖ Revenue by Category
- ❖ Revenue by Size
- ❖ Hourly Order Trend

Purpose: Provide a high-level business performance snapshot for management.

2️⃣ Product Performance

- ❖ Top 5 Pizzas by Revenue
- ❖ Top 5 Pizzas by Quantity
- ❖ Revenue by Category
- ❖ Revenue by Size
- ❖ Interactive Category Filtering
- ❖ Dynamic Page Title

Purpose: Identify revenue drivers and demand leaders.

3️⃣ Operational Insights

- ❖ Orders by Hour
- ❖ Revenue by Hour
- ❖ Average Preparation Time by Hour
- ❖ Peak Demand Identification
- ❖ Kitchen Pressure Analysis

Purpose: Connect demand patterns with operational efficiency.

🎨 Advanced UX Features

- ★ Multi-page structured navigation
- ★ Dynamic page titles using DAX
- ★ Conditional formatting for category-based styling
- ★ Clean executive layout design
- ★ Export-safe embedded visuals
- ★ Balanced visual spacing & consistent formatting
- ★ Slicer-based interactive filtering

The dashboard balances analytical clarity with professional presentation design.

🔍 Key Business Insights

- ★ Identified peak sales hours and revenue concentration windows.
- ★ Observed demand spikes aligned with increased preparation time.
- ★ Detected high-volume pizzas not necessarily generating the highest revenue.
- ★ Identified size contribution patterns affecting revenue mix.
- ★ Highlighted operational pressure during peak demand periods.

💼 Business Recommendations

- ★ Increase staffing during peak hours.
- ★ Monitor prep time during high-demand windows.
- ★ Promote high-margin pizzas during slower hours.
- ★ Consider pricing adjustments for top-performing sizes.
- ★ Use hourly analysis to optimize production planning.

🧪 KPI Integrity Validation

To ensure accuracy:

- ★ Cross-validated revenue = price × quantity
- ★ Verified relationship direction for correct filter propagation
- ★ Confirmed hour-based aggregation consistency

- ★ Tested category filtering impact across pages
- ★ Validated prep time logic using row-level calculations
- ★ Ensured no circular dependencies in model

Data type corrections were applied where necessary (time columns).

🛠️ Tools Used

- ★ Power BI Desktop
- ★ DAX (Advanced Filter Context Handling)
- ★ Data Modeling (Star Schema Principles)
- ★ Power Query (ETL & Data Type Correction)
- ★ Relational Data Modeling
- ★ CSV data sources

🗃️ Project Files

```
Pizza-Sales-Operational-Intelligence/
│
├── data/
│   ├── tab_orders.csv
│   ├── tab_order_details.csv
│   ├── tab_pizzas.csv
│   ├── tab_operations.csv
│
├── dashboard/
│   └── Pizza_Sales_Operational_Dashboard.pbix
│
├── report/
│   └── Pizza_Sales_Operational_Dashboard.pdf
│
├── template/
│   └── Pizza_Sales_Operational_Template.pbit
│
├── assets/
│   ├── dashboard_preview.png
│   ├── model_view.png
│
└── README.md
```

🚀 Portfolio Value

This project demonstrates:

- ★ End-to-end BI development
- ★ Strong relational data modeling
- ★ Practical DAX implementation
- ★ Operational analytics integration
- ★ Business KPI design thinking
- ★ Dashboard UX optimization
- ★ Debugging and data-type correction skills

It reflects the ability to move beyond basic revenue reporting and deliver integrated financial and operational intelligence.

👦🏻 Author

Anirudha Das
Aspiring Data Analyst / Business Intelligence Professional
📍 Bolpur, WB, India