Here is your comprehensive technical documentation for the Power BI project, structured in three chapters as requested:

Technical Documentation: Power BI Data Model

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1. Data Modeling: Architecture and Data Flows

1.1 Model Overview

- **Model Name:** Model
- **Culture:** fr-FR (French locale)
- **Default Power BI Data Source Version:** powerBI_V3
- **Source Query Culture:** fr-FR
- **Data Access Options:**
    - Legacy redirects enabled
    - Error values returned as NULL

1.2 Architecture

The model consists of two main tables:

- **Dim_Date:** A calculated date dimension table, generated programmatically for the date range 2021–2030.
- **Fact_Sales:** A fact table containing sales data, imported from an Excel file.

Data Flow:

1. **Dim_Date:**
    - **Source:** Programmatically generated using DAX (CALENDAR function).
    - **Purpose:** Provides a comprehensive date hierarchy for time intelligence and filtering.
    - **Data Category:** Time
2. **Fact_Sales:**
    - **Source:** Excel file (Sales.xlsx), transformed using Power Query (M language).
    - **Purpose:** Stores sales values by date.
    - **Transformation Steps:**
        - Load data from Excel.
        - Promote headers.
        - Unpivot columns to normalize date-value pairs.

- Rename columns for clarity.

3. **Relationship:**
   - **Fact_Sales.Date → Dim_Date.Date:** Establishes a link between sales data and the date dimension.

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2. List of Tables and Measures

2.1 Tables

Tables

Table Name	Type	Description
Dim_Date	Calculated	Date dimension with hierarchical levels (Year, Month, Day, etc.).
Fact_Sales	Imported	Sales data with values associated with dates.

2.2 Columns in Dim_Date

Dim_Date Columns

Column Name	Data Type	Format	Description	Lineage Tag
Date	Date	General Date	Primary key.	4f0b183d-a93f-4b76-93d6-a1b0942448c2
Year	Text	0	Year (e.g., 2024).	53f72a62-40b7-4911-91c3-5d4d4d54b771
YearSemester	Text	-	Year and semester (e.g., 2024-S1).	fad97932-5b2f-4afb-a125-4769aa8652f4
YearQuarter	Text	-	Year and quarter (e.g., 2024-Q1).	f6177fc6-3ff9-48fa-a61d-0f60ad33e410
YearMonth	Text	-	Year and month (e.g., 2024-01).	11ea6d69-6b4c-428d-9592-c39ff26d56cc
YearWeek	Text	-	Year and week (e.g., 2024-W1).	9f95c5f4-50d3-41f2-92be-af01693db2a2
Semester	Text	-	Semester (S1 or S2).	9cabef71-a107-4a1c-858e-d7ecb1680461
Quarter	Text	-	Quarter (Q1, Q2, Q3, Q4).	58ba883a-edd3-480b-8da4-afe02dfb9366

Column Name	Data Type	Format	Description	Lineage Tag
MonthLong	Text	-	Full month name (e.g., January).	7ba06ce6-48da-4518-b794-ceb1c7b0df90
Month	Text	-	Short month name (e.g., Jan).	ba92a18c-c279-4f11-b175-b8e7353d00e2
Week	Text	-	Week number (e.g., W1).	b1f5f128-3ab0-4e70-b0d3-8e47da05f957
Day	Text	-	Day name (e.g., Monday).	8432e01d-b852-45bd-b645-7a8d49a12b1a
NumMonth	Number	0	Numeric month (1–12).	cb857866-b5d5-4a47-9d5e-bc857f09d6f0
NumWeek	Number	0	ISO week number (1–53).	17219801-7445-486f-a049-5cfb4cd58738
NumDayWeek	Number	0	Day of the week (1–7, Monday=1).	55feeea7-ee78-4888-81fc-d27b977a9203
NumDayMonth	Number	0	Day of the month (1–31).	29274bd9-136d-4108-83e8-9f807d61808c
MonthShort	Text	-	Abbreviated month (e.g., J for January).	4a427417-b36e-48aa-b159-76b041c387d2

- **Hierarchy:** Date Hierarchy (Year → Month)

2.3 Columns in Fact_Sales

Fact_Sales Columns

Column Name	Data Type	Format	Description	Lineage Tag
Date	DateTime	Long Date	Foreign key to Dim_Date.Date.	052d24a0-2fea-4a23-9c9b-6989e72d8181
Value	Int64	0	Sales value (summarized by sum).	b6c00bb0-53f5-440b-b9d9-cef03f618ed3

2.4 Measures

- **No explicit measures** are defined in the provided TDML code. Measures can be added in Power BI Desktop for aggregations (e.g., Total Sales = SUM(Fact_Sales[Value])).

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3. Maintenance: Guide to Data Sources and Best Practices

3.1 Data Sources to Update

1. **Dim_Date:**
    - **Update Trigger:** Adjust the date range in the CALENDAR function (e.g., extend beyond 2030 if needed).
    - **Location:** TDML script (calculated table).
2. **Fact_Sales:**
    - **Update Trigger:** Replace or update the source Excel file (Sales.xlsx).
    - **Location:** C:\Users\Personnel\OneDrive\Documents\Patou Tips\# Patou Tips\#50 Patou Tips (Develop faster with TDML - Develop faster)\Sales.xlsx
    - **Steps:**
        - Update the Excel file with new data.
        - Refresh the Power BI dataset to import changes.

3.2 Best Practices

Data Modeling:

- **Date Dimension:** Ensure Dim_Date covers all required dates in Fact_Sales.
- **Relationships:** Verify the active relationship between Fact_Sales.Date and Dim_Date.Date.

Data Refresh:

- **Automate Refresh:** Schedule automatic refreshes in the Power BI Service for the Excel source.
- **Error Handling:** Monitor for errors in the Excel file (e.g., missing columns, data type mismatches).

Performance:

- **Partitioning:** Consider partitioning Fact_Sales for large datasets.
- **Query Optimization:** Simplify Power Query steps to reduce load times.

Documentation:

- **Lineage Tags:** Use lineage tags for impact analysis and auditing.
- **Annotations:** Document changes to the TDML script for future reference.

Collaboration:

- **Version Control:** Store TDML scripts in a version control system (e.g., Git).

- **Culture Settings:** Ensure consistency between culture: fr-FR and data sources.

3.3 Troubleshooting

- **Common Issues:**
    - **Missing Dates:** Extend the CALENDAR range in Dim_Date.
    - **Broken Relationships:** Check for mismatched data types or NULL values in key columns.
    - **Excel Changes:** Validate column names and data types after updating the source file.

Would you like me to generate a visual diagram of the data model or provide sample DAX measures for common calculations?