VISUALIZING US NATURAL DISASTER DECLARATION – TRENDS AND PATTERNS

Week 5 Documentation

Visualization and Data Modelling in Power BI

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1. Introduction

Week 5 focused on understanding the types of data used in Power BI, selecting appropriate visualization techniques, and learning the fundamentals of data modelling. These concepts are essential for building meaningful dashboards that not only display data but also reveal insights through relationships between tables.

2. Types of Data in Power BI

2.1 Categorical Data

- Examples: High/Low, Male/Female, State, Country etc
- Represents discrete groups or categories.
- Best suited for comparison and distribution charts.

2.2 Numerical Data

- Examples: Sales figures, population counts, revenue.
- Represents continuous values that can be aggregated or compared.

2.3 Time-Based Data

- Examples: Dates, timestamps, fiscal years.
- Enables trend analysis and time-series visualizations.

3. Visualization Techniques

3.1 Categorical Data Charts

- **Bar Chart**: Compare values across categories (e.g., Male vs Female).
- **Pie Chart**: Show distribution of categories.
    - Avoid using more than 6 categories in a pie chart.
    - When slicers or filters are applied, ensure that proportions sum to 100%.

3.2 Time Series Data Charts

- **Line Chart**: Best for trends over time (e.g., stock market performance).

4. Data Modelling in Power BI

4.1 Concept

- Data modelling creates relationships between tables using **Primary Keys** and **Foreign Keys**.

- Ensures data integrity and enables cross-table analysis.

4.2 Table Types

- **Fact Table**: Contains references and transactional data (e.g., sales records).

- **Dimension Table**: Contains descriptive details (e.g., customer names, product categories).

4.3 Relationships

- Connections require a **common column** between tables.

- Power BI automatically creates relationships if column names match.

- Relationship types:

  - **Many-to-One (* → 1)**: Most common, e.g., many sales records linked to one customer.

  - **One-to-Many (1 → *)**

  - **One-to-One (1 → 1)**

  - **Many-to-Many (* → *)**: Rarely used due to complexity.

4.4 Schemas

Star Schema: Central fact table connected to multiple dimension tables.

For Example:
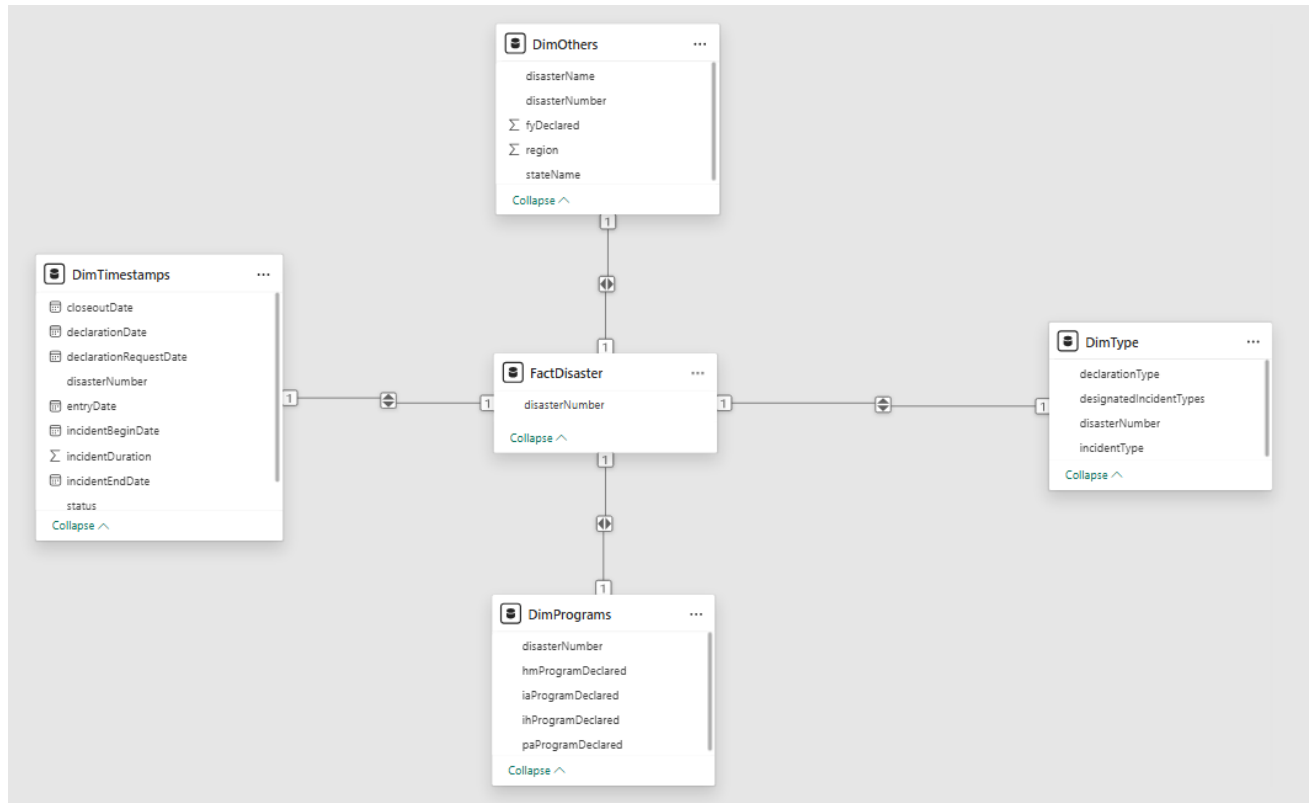
5. Outcome of Week 5

By the end of Week 5:

- Learned how to classify data into categorical, numerical, and time-based types.
- Understood which charts are appropriate for each data type.
- Gained knowledge of data modelling concepts, including fact and dimension tables.
- Practiced creating relationships between tables in Power BI.
- Explored schema design for scalable and professional dashboards.

6. Next Steps (Week 6 Preview)

Explore DAX functions for calculated measures in PowerBI.