



Space Mission Dashboard Project

End-to-End Data Pipeline Report

Overview

This report documents the complete process of building the Space Mission Dashboard—from data extraction and transformation in Excel to data modeling and visualization in Power BI. The final solution is structured using a star schema and hosted on GitHub for collaboration, reproducibility, and scalability.

1. Source Data and Initial Setup

- **File:** 3.-Space_Missions_Challenge-3.xlsx
 - **Sheet:** Space_Missions_Challenge 3
 - Loaded into Power Query Editor for cleaning and transformation.
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2. Power Query Data Transformation (Excel & Power BI)

Key Steps

◆ Load Source Data

- Promoted headers and assigned data types.
- Cleaned and standardized all columns (e.g., dates, prices, IDs).

◆ Create Dimension Tables

- **dimDate:** Extracted Month Name, Year, and added DateID.
- **dimLocation:** Parsed Country from Location, added LocationID.
- **dimCompany:** Assigned CompanyID after removing duplicates.
- **dimRocket:** Cleaned rocket names and statuses, assigned RocketID.

◆ Build FactMission Table

- Cleaned MissionName, removed special characters, and trimmed spaces.
- Replaced "unknown" in Price with 0, converted to numeric, and rounded.

- Joined dimension IDs and dropped descriptive columns.
- Final structure:

[MissionID, MissionName, MissionStatus, Price, LocationID, CompanyID, DateID, RocketID]

3. Power BI Query Editor Workflow

◆ FactMission Table

- Cleaned mission names using Text.Clean, Text.Remove, and Text.Trim.
- Filtered out rows with null or empty mission names.
- Replaced unknown price entries and rounded values.

◆ Dimension Tables (dimRocket, dimLocation, dimDate, dimCompany)

- Loaded sheets, promoted headers, set appropriate types.
 - Removed duplicates to ensure referential integrity.
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4. Data Model Design in Power BI

Star Schema Structure

- **Fact Table:** FactMission
- **Dimension Tables:** dimDate, dimCompany, dimLocation, dimRocket

Relationships

- One-to-many, active relationships from each dimension to FactMission:
 - CompanyID, LocationID, RocketID, DateID
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5. DAX Measures and Calculations

◆ Core Measures in FactMission

Total Mission = COUNTROWS(FactMission)

Successful Missions = CALCULATE([Total Mission], FactMission[MissionStatus] = "Success")

FailureRate = DIVIDE([Total Mission] - [Successful Missions], [Total Mission])

SuccessRate = DIVIDE([Successful Missions], [Total Mission])

Mission_Cost = SUM(FactMission[Price])

Cumulative Upto Previous Year = CALCULATE([Total Mission], FILTER(ALL(dimDate), dimDate[Year] < MAX(dimDate[Year])))

Total Mission YoY% = DIVIDE([Total Mission] - [LY Missions], [LY Missions])

◆ Country-Specific Measures (in Table)

Total Mission - USA = CALCULATE([Total Mission], dimLocation[Country] = "USA")

- Similar measures created for CHN, RUS, FRA, and KZK.

6. Dashboard Design in Power BI

◆ Visual Components

- **Cards:** KPIs such as total missions and success rate
- **Bar/Column Charts:** Mission count by company, year, and country
- **Line Charts:** Trends in launches over time
- **Slicers:** Filter by year, company, and mission status
- **Tables/Matrices:** Detailed mission-level insights

Formatting & UX Enhancements

- Applied custom JSON theme for brand consistency
- Used tooltips, alignment, and conditional formatting
- Enabled interactivity through drill-through and slicer sync

7. GitHub Integration

Repository Structure

/data # Raw and transformed Excel files

/reports # Power BI .pbix dashboard file

/docs # Supporting documentation

README.md # Project overview and usage instructions

Version Control Advantages

- Promotes transparency and team collaboration
 - Ensures reproducibility for future iterations
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Conclusion

This project showcases a complete business intelligence workflow—from raw data extraction and transformation to model development and visual storytelling. With clean design practices and thoughtful DAX implementation, the Space Mission Dashboard enables efficient analysis and insight delivery. Hosting on GitHub guarantees open access and ongoing improvement.