**Project Report**

**Title: Exploring the Cosmos: Analyzing ISRO's Mission Launches with Power BI**

1. Introduction

This project focuses on analyzing the Indian Space Research Organisation's (ISRO) mission launches using Power BI. The primary aim is to derive actionable insights from historical data of ISRO launches by employing visual data analytics. The analysis includes metrics such as launch counts, success rates, launch vehicles, and orbits classified by application.

2. Objectives

The objectives of this project are:

1. To analyze the number of launches conducted over the years.

2. To assess launch activity by month.

3. To calculate the total number of launches.

4. To determine the total number of successful and unsuccessful launches.

5. To analyze launches by launch vehicles.

6. To evaluate the distribution of launches into different orbits based on application.

7. To visualize the number of launches into specific orbits.

3. Methodology

3.1 Data Collection

Data on ISRO launches was collected from publicly available sources, including ISRO’s official website, research papers, and credible secondary sources.

3.2 Tools and Software

- Microsoft Power BI for data visualization.

- Excel or CSV files to store and preprocess the data.

3.3 Data Preparation

The data was cleansed, formatted, and standardized into structured columns including:

- Launch Year

- Launch Month

- Launch Vehicle

- Launch Outcome (Success/Failure)

- Orbit Type

- Application Type (e.g., Communication, Navigation, Earth Observation, etc.)

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4. Key Visualizations and Insights

4.1 Number of Launches by Year

- A line chart was used to display the trend in the number of launches over time.

- Insight: The chart reveals growth patterns in ISRO's launch frequency.

4.2 Number of Launches by Month

- A bar chart categorized by months shows launch preferences.

- Insight: Identified months with peak launch activities, indicating seasonality trends.

4.3 Total Number of Launches

- A card visual displayed the total number of ISRO missions.

- Insight: Provides an overall picture of ISRO's cumulative efforts.

4.4 Total Number of Successful Launches

- A card illustrates the proportion of successful launches.

- Insight: High success rate indicates ISRO’s robust technology and execution.

4.5 Total Number of Unsuccessful Launches

- A card illustrates the proportion of unsuccessful launches.

- Insight: Offers perspective on challenges faced by ISRO.

4.6 Total Number of Launches by Launch Vehicle

- A clustered bar chart displays launches categorized by vehicles (e.g., PSLV, GSLV, SSLV).

- Insight: Highlights ISRO's reliance on specific launch vehicles for missions.

4.7 Total Number of Launches into Orbits by Application

- A stacked bar chart classifies orbit types (LEO, MEO, GTO, etc.) based on application.

- Insight: Demonstrates how ISRO prioritizes satellite applications for Earth Observation, Navigation, etc.

4.8 Number of Launches into Orbits

- A pie chart displays the distribution of orbits (LEO, MEO, GTO, etc.).

- Insight: Identifies ISRO’s focus areas for orbit-based launches.

5. Results

1. The yearly analysis indicates a consistent increase in ISRO’s launch frequency, especially in recent years.

2. Certain months exhibit higher launch activities, suggesting optimal weather conditions.

6. Conclusion

This project highlights ISRO's achievements and contributions to space exploration through comprehensive data visualization. The use of Power BI enabled dynamic insights into ISRO's launch trends, application priorities, and technological capabilities.