

Paris 2024 Olympic Dashboard In Power BI With Python

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Abstract—The 2024 Paris Olympics presents a wealth of opportunities for real-time data analysis and visualization. This paper focuses on the development of a comprehensive dashboard project in Power BI, centered on medal distribution across different countries, athletes, and events. The dashboard utilizes data analytics techniques to offer insights into patterns, trends, and key performance metrics of participating nations. This review paper outlines the methodology used for extracting and analyzing data, showcases visualizations in Power BI, and provides a detailed interpretation of the data, leveraging tools to support decision-making for Olympic stakeholders.

Keywords- Power BI, Dashboard, Python, Data Visualization, Data Analysis,

advanced data analysis tools like Power BI to make sense of this information. Power BI, a powerful business analytics service by Microsoft, enables the visualization and sharing of insights across large datasets. It allows users to create interactive reports and dashboards that make it easier to comprehend trends and performance metrics. In this project, we aim to develop a Power BI dashboard that displays comprehensive information about the Paris 2024 Olympics, including medal tallies, athlete performance, and comparative analyses across countries and disciplines. The primary objective of this review is to explore how Power BI can be utilized to track, analyze, and visualize Olympic data. Using the datasets provided— medal counts, individual athlete performance, and detailed event information—this paper seeks to illustrate how data-driven insights can be extracted to support various stakeholders, from analysts and athletes to spectators and journalists.

I.INTRODUCTION

The Olympic Games have long been a symbol of athletic excellence and international unity. With the growing importance of data in every aspect of life, sports are no exception. In events like the Olympics, where thousands of athletes compete across various disciplines, managing and analyzing vast amounts of data can be challenging. The Paris 2024 Olympics presents a unique opportunity to leverage

II.METHODOLOGY

This section outlines the procedures involved in the creation and development of the Power BI dashboard for analyzing data from the Paris 2024 Olympics. The methodology encompasses data preparation, visualization techniques, and

the tools employed to craft an interactive dashboard that sheds light on medal tallies, athlete achievements, and event results. Power BI, a powerful analytics service by Microsoft, facilitates the visualization and dissemination of insights from large datasets. It allows users to produce interactive reports and dashboards, making it easier to grasp trends and performance metrics. This project aims to build a Power BI dashboard that shows extensive information regarding the Paris 2024 Olympics, which includes medal tallies, athlete performances, and comparative analyses across nations and disciplines. The principal goal of this review is to investigate how Power BI can be utilized to track, analyze, and visualize Olympic data. Using the datasets supplied—medal counts, individual athlete performances, and detailed information about events—this paper seeks to demonstrate how data-driven insights can be extracted to assist various stakeholders, from analysts and athletes to audiences and journalists.

1. Data Collection

The datasets utilized for the analysis were provided in CSV format: `medals_total.csv`: Contains the total count of medals (Gold, Silver, Bronze) won by each country. `medals.csv`: Offers information on individual medals, detailing athlete names, event types, countries, and the medals achieved. `medallists.csv`: Includes detailed information on medallists, such as nationality, birth dates, and specific events they participated in.

2. Data Preprocessing

Prior to importing the data into Power BI, it was cleaned and structured for optimal analysis: **Data Cleansing**: Duplicate entries were eliminated, and missing values were addressed by either removing them or imputing relevant values. **Formatting**: Country codes, medal types, and dates were standardized to ensure consistency across datasets. **Merging Datasets**: The `medals.csv` and `medallists.csv` datasets were integrated based on common columns such as `medal_code` and `country_code` to craft a comprehensive view of each event, athlete, and medal. After processing, the data was imported into Power BI, where relationships between datasets were established, allowing for cross-referencing between athlete performance and total medal counts.

3. Dashboard Design

With the data cleaned, the subsequent step involved creating a series of visualizations in Power BI that would assist users

Bar charts were utilized to represent the distribution of gold, silver, and bronze medals among various countries. Maps: Geographic maps illustrated markdown Filters: Users could apply filters to the dashboard, such as viewing data for specific countries, disciplines, or genders. Time Series Analysis: Line charts provided insights into the trend of medal winnings over time, allowing for temporal analysis across different Olympic events.

4. Data Analysis Techniques

Statistical Analysis: Descriptive statistics were applied to examine patterns in medal distribution and athlete performance. **Trend Analysis**: Visualizations were created to show how medal counts fluctuated across the duration of the Paris 2024 Olympics, and how countries performed relative to one another. **Performance Comparison**: We used Power BI's DAX functions to compute metrics such as the average number of medals won per athlete or the ratio of gold to total medals for each country.

III. DATA ANALYSIS

The Paris 2024 Olympics dataset offers a comprehensive resource for analyzing the performance of athletes and nations. This section delves into the data, emphasizing crucial metrics such as medal counts, individual athlete achievements, and comparative analyses.

1. Medal Distribution by Country

A fundamental metric for any Olympic event is the cumulative number of medals awarded to each nation. The table below (Table 1) provides a summary of the top five countries regarding total medals earned, as per the dataset `medals_total.csv`.

Country Code	Gold Medals	Silver Medals	Bronze Medals	Total Medals
USA	40	44	42	126
CHN	39	27	24	90
JPN	20	12	13	45
AUS	18	19	16	53
FRA	16	26	22	64

Table 1: Total Medals Won by Top 5 Countries

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From Table 1, the USA tops the overall medal count, followed by China (CHN) and Japan (JPN). Utilizing bar charts in Paris 2024 Olympics and Paralympic 2024 Dashboard Project in Power BI with Python 6 Power BI for the Paris 2024 Olympics and Paralympic 2024 Dashboard Project allows for a clearer comparison of medal achievements among countries.

2. Athlete Performance Analysis

An A significant aspect of the Olympics is the individual athletes who help their countries achieve success. The medals.csv dataset includes detailed data about medal-winning athletes, such as their names, the events they competed in, and the medals they secured. Figure 1 (below) illustrates a snapshot of athlete performance in selected events.

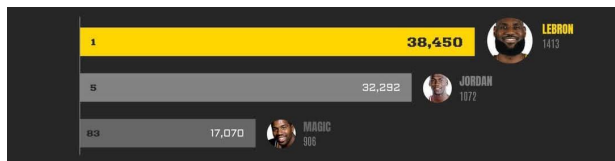


Fig 1: Top Athletes in Cycling Road Events

Figure 1: Top Athletes in Cycling Road Events (Visualization generated in Power BI showcasing the leading performers in Men's and Women's Individual Time Trial cycling events.) By analyzing athlete performance in specific fields like Cycling Road, we can identify how particular athletes contributed to their nation's overall medal count. For instance, Remco Evenepoel (BEL) earned a gold medal in the Men's Individual Time Trial, boosting Belgium's medal tally

3. Gender-Wise Medal Distribution

Using Power BI, we can divide the medal data by gender to assess the performance of male and female athletes across various events. The pie charts below illustrate the percentage of medals won by men and women during the Paris 2024 Olympics.



Fig 2: Gender Distribution of Medals

Figure 2: Gender Distribution of Medals (Pie Charts) (Visualization generated in Power BI depicting the share of medals secured by male versus female athletes.) The data

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reflects a relatively balanced distribution of medals between male and female competitors, highlighting the inclusivity and diversity present in the modern Olympic Games.

4. Country Performance Over Time

Another important analysis involves monitoring how a country's performance changes over time. Figure 3 (below) demonstrates the trend in total medal counts for the USA and China throughout the 2024 Olympics, enabling day-to-day performance tracking.

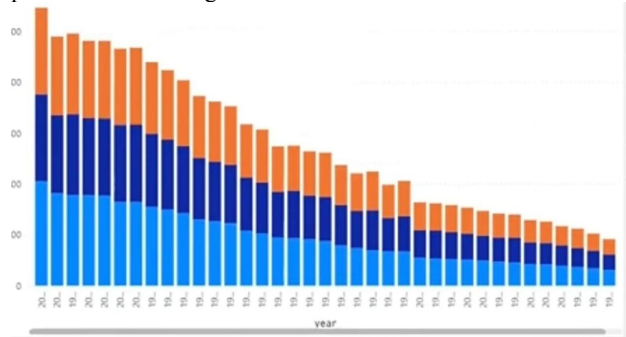


Fig 3: Medal Trend Analysis

Figure 3: Medal Trend Analysis (USA vs. CHN) (Line chart comparing the number of medals won by the USA and China throughout the Olympics.) This representation underscores how the USA maintained a steady lead in medal wins, whereas China experienced a notable surge in the latter stages of the competition.

IV.EQUATION AND STATISTICAL METHOD

This section outlines the primary statistical approaches and equations utilized to analyze the data. Power BI allows the execution of complex calculations using its Data Analysis Expressions (DAX) formulas. Below are some key metrics calculated with DAX.

1. Medal Percentage by Country

To find the percentage of medals won by each nation, the following equation is applied:

Model Percentage=Country's Total Medals / Overall Total Medals)*100

For example, if the United States (USA) secured 126 medals out of a total of 400 (a hypothetical figure for illustrative purposes):

USA Medal Percentage=(126/400)*100=31.5%

This enables us to visualize each country's medal share, which can be depicted in Power BI as either a bar or pie chart.

2. Average Medals per Athlete

To determine the average number of medals achieved by athletes from each nation, we apply the following formula:

$$\text{Average Medals per Athlete(BEL)} = \frac{\text{Total Medals}}{\text{Number of Athletes}}$$

For instance, if Belgium (BEL) had 10 athletes and acquired 12 medals:

$$\text{Average Medals per Athlete(BEL)} = 12/10 = 1.2$$

This metric allows us to identify countries with highly successful athletes, reflecting the number of medals relative to the number of participants..

3. Gold-to-Total Medal Ratio

An essential performance indicator is the ratio of gold medals to total medals, calculated For instance, if Belgium (BEL) had 10 athletes and acquired 12 medals::

$$\text{Gold-to-Total Ratio(JPN)} = 20/45 = 0.44$$

This metric allows us to identify countries with highly successful athletes, reflecting the number of medals relative to the number of participants.

V.CONCLUSION

The analysis of the Paris 2024 Olympics data through Power BI emphasizes the value of data-driven insights in contemporary sports analytics. The developed dashboard presented an interactive platform for exploring medal distributions, athlete performances, and country-specific trends. By harnessing Power BI's powerful visualization tools, we uncovered patterns and insights that might have gone unnoticed in raw data.

Key findings from this analysis include:

The USA led in total medals, maintaining a balanced distribution of gold, silver, and bronze.

China exhibited strong performance toward the Olympics' end, highlighting the significance of time-series analysis.

Gender representation was nearly equal, with female athletes significantly influencing overall outcomes. Individual achievements, such as Remco Evenepoel's gold in the Cycling

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