

GAMES OF GLORY : A VISUAL ODYSSEY OF THE SUMMER OLYMPICS



**Developing a Power BI Dashboard to analyze and visualize
key trends and data from the modern Summer Olympics,
covering the Sydney 2000 to Rio 2016 Games.**

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01. Introduction

The Olympic Games is recognized as a pinnacle of the global sporting events which is celebrated and endured, showcasing athletic prowess and international unity, bringing together athletes from around the world to compete at the highest level.

This report delves into a comprehensive analysis of the historical data from five modern summer Olympic Games, spanning from the Sydney 2000 Games to the Rio 2016 Games. This task aims to explore and visualize key aspects of the Olympics, such as trends in athlete participation, medal distribution, and performance metrics, through the development of an interactive Power BI dashboard. By leveraging data visualization techniques, the report aims to uncover patterns and insights that highlight the evolving landscape of the Summer Olympics, providing a deeper understanding of the factors contributing to the glory and legacy of this prestigious event.

02. Explanation and Preparation of the Dataset

The Olympics dataset rich with the information of many historic Olympic Games, provides a robust foundation for analyzing these trends and patterns, offering a unique opportunity to visualize the achievements and stories that define the modern Olympic Legacy. This data set can be obtained using the following link.

https://figshare.com/articles/dataset/Olympic_history_longitudinal_data_scraped_from_www_sports-reference_com/6121274?file=11693840

The dataset contained 271,116 rows and 15 columns initially, including the null values. First, the dataset was imported to Microsoft Power BI, where it was subsequently cleaned, wrangled, and pre-processed by transforming it to meet our specific requirements using. This process involved addressing missing data, eliminating null values and duplicates, and addressing any anomalies before moving forward with the analysis.

After pre-processing and preparing the dataset, the necessary tables and relevant relationships were also established using the Microsoft Power BI Platform. Subsequently, we focused on creating insightful visualizations to construct an interactive dashboard.

03. Implementation and Designing of the Dashboard

An interactive dashboard was developed using Microsoft Power BI, with the primary objective of exploring and visualizing critical aspects of the Summer Olympic Games, including trends in

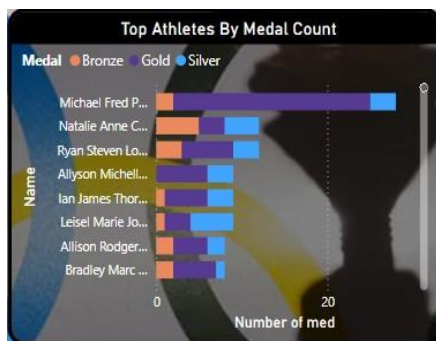
athlete participation, medal distribution, and performance metrics, through the application of various data visualization techniques such as various graphs and charts.

The dashboard we created using Microsoft Power BI consists of 6 pages.

- **Page 1 : The Cover Page** (Acts as an introductory page to the dashboard)
- **Page 2 : Athletes' Performances Overview** (Shows a comprehensive summary of athlete performances based on demographic features such as gender, age, height, weight, etc.)
- **Page 3 : Medal Distribution Analysis** (Shows the breakdown of an Athlete's medal achievements, highlighting the types of medals won and analyzing trends over time, etc)
- **Page 4 : Sports and Events Highlights** (A page that explores the number of events an athlete has participated in, with a focus on win loss records, most popular games, event trends over time, etc.)
- **Page 5 : Host City Highlights** (A visualization of the global distribution of Olympic host cities and participants, and achievements)
- **Page 6 : The Last Page** (The concluding page to the dashboard)

04. Key Patterns and Insights

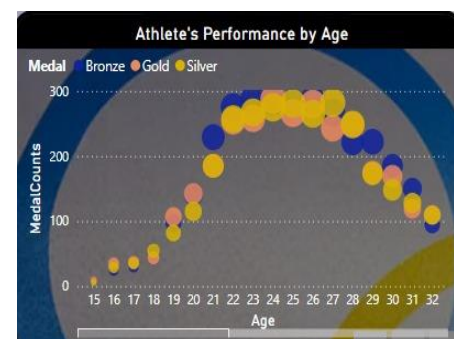
Out of all the visualizations, the following plots/graphs highlight a few key patterns and insights.

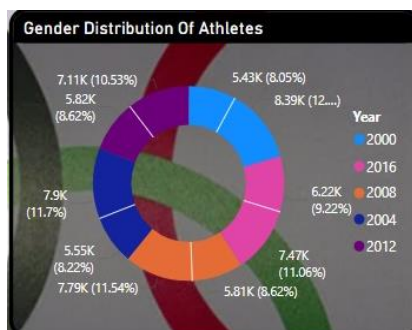


• The Athlete's Performance Analysis

There are several factors that affect the success rates and performance rates of an athlete. This chart helps to identify the top athletes according to their medal achievements. Accordingly, *the top 3 athletes with the highest number of Olympic medals are Michael Fred Phelps, Natalie Anne Coughlin and Ryan Steven Lochte. Michael Phelps clearly dominates with an overwhelming number of gold medals. Though the sum of medals achieved by Ryan S. Lochte is less than Natalie A. Coughlin, the number of gold medals won by him is higher than Natalie A. Coughlin. Most athletes have a relatively even medal distribution, emphasizing Phelp's unmatched Olympic success compared to other top competitors.*

According to this scatter plot that shows the correlation between athletes' ages and medals won, it shows that *the athletes peak in performance between the ages 23 – 27 with gold medals most common in this period. Medal counts decline steadily after age 27, reflecting typical decline in athletic performance with age. This pattern reflects the general athletic trend where peak physical performance declines with the athlete's age, with mid 20 age athletes frequently exhibiting peak physical performance.*





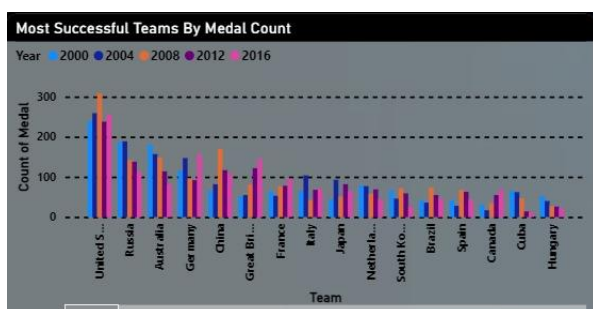
The "Gender Distribution of Athletes" chart by year reveals that *the 2000 Olympics had the highest athlete participation, accounting for 20.48% of the total, while 2012 had the lowest at 19.15%. The most number of female participation was observed during the year 2016 (21.29%) while the male participation was seen in year 2000 (21.71%). The key pattern observed through this chart is that the female participation at the Olympic Games has gradually increased while the male participation shows a significant decline.*

- Medal Distribution Analysis**

This card shows the sum of medal distribution under each medal category. As it is shown, *the total number of medal count in descending order is Bronze, Gold and Silver.*



Other than that, key patterns under the medal distribution analysis we observed through the clustered bar chart of Most Successful teams by Medal Count.



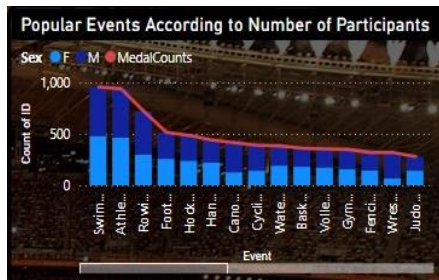
This chart compares the sum of medals of different countries at each hosted year, where *the United States has been consistently leading in each year, peaking significantly in 2016. Russia and Australia maintains strong presence, though their medal counts fluctuates across the years. Countries like Great Britain and Germany also shows steady performances. There's a significant rise in the China's medal*

count in 2008. Other nations like France, Italy and Japan maintain solid positions, while countries like the Netherlands and South Korea contributes steadily with lower medal counts. Overall, this illustrates the global competition among top-performing countries and the shifting dynamics of Olympic success over time.

- Sports Events and Highlights**

This table showcases an insightful overview of the Olympic Games from 2000 to 2016, spotlighting key events and standout performances by athletes across various sports. It captures the essence of each Olympic event, showcasing memorable achievements, record-breaking performances, and the athletes who left an indelible mark on the Games with their achievements. The table shows the achievements mainly categorized under the hosted years and they are further sub-categorized under each event and the medal categories displaying the athlete's names under each relevant category.

Olympic Medalists By Event	
Year	Name
2000	Aaron John McIntyre
2004	Aaron Egbele
2008	A. Joshua "Josh" V
2012	Aaron Gate
2016	Aaron Brown
Archery Men's Individual	Brady Lee Ellison
Archery Men's Team	Alec Potts
Archery Women's Individual	Chang Hye-Jin
Archery Women's Team	Chang Hye-Jin
Athletics Men's 1,500 metres	Matthew Gerald "Ma
Athletics Men's 10,000 metres	Mohamed Muktar J
Athletics Men's 100 metres	Andre De Grasse
Athletics Men's 110 metres Hurdles	Dimitri David Basco
Athletics Men's 20 kilometres Walk	Cai Zelin
Athletics Men's 200 metres	Andre De Grasse
Athletics Men's 3,000 metres Steeplechase	Conseslus Kipruto
Athletics Men's 4 x 100 metres Relay	Aaron Brown
Athletics Men's 4 x 400 metres Relay	Alonzo Russell
Total	A. Joshua "Josh" V



Further, the bar chart below illustrates that *Swimming and Athletics are the most popular Olympic events, with the highest participation. Except for Rowing and Cycling which exhibit a slight male dominance, gender distribution is relatively balanced across most sports. The line indicating medal counts reveals that high participation sports like Swimming and Athletics offer more medals opportunities. Overall, this chart highlights the prominence of certain sports in terms of both participations according to gender distribution and medal distribution.*

05. Recommendations for further Analysis

To build upon the insights obtained from this analysis, several areas require further exploration. First, a detailed understanding of the factors contributing to an Olympian athlete's performance. This can include analyzing the impact of training conditions, coaching quality, economic factors in an athlete's native country.

Furthermore, analyzing how technological improvements affect performance in other sports may highlight important differences. The evolution of gender representation in the Olympics is another topic of study, with an emphasis on the variables influencing higher female participation and how that affects medal distribution. While this report has highlighted the increasing participation of female athletes, a more focused analysis could explore the barriers and facilitators of female participation in various nations and sports.

Lastly, broadening the analysis to include the Olympic Winter Games or other international competitions could provide a more comprehensive understanding of global athletic trends and competition.

06. Conclusion

In conclusion, this comprehensive analysis of historical data from five modern Summer Olympic Games, spanning from Sydney 2000 to Rio 2016, has provided valuable insights into crucial aspects of the Olympics, such as athlete participation, medal distribution, and performance metrics.

The analysis shows that the United States consistently emerges as the most successful team, particularly excelling in Swimming, which stands out as the most popular event. The findings also revealed that Bronze emerges as the most frequently awarded medal. Michael Fred Phelps is recognized as the most decorated athlete. The 2000 Sydney Olympics had the highest number of

participants, and the peak performance age for the athletes was identified as between 23 and 27 years.

This interactive dashboard, developed using Microsoft Power BI, not only visualizes these patterns but also highlights the evolving dynamics of the Summer Olympics, providing a deeper understanding of the achievements, accomplishments and narratives that define the modern Olympic legacy.

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