

## **Data Visualisation and Analysis of ICC Cricket World Cup 2023 Using Tableau**

B. Sawan Baijal, UG Student, Dept. of AI&DS, Methodist College of Engineering, Hyderabad, India

K. Kumar Bhargav, UG Student, Dept. of AI&DS, Methodist College of Engineering, Hyderabad, India

R. Akhil, UG Student, Dept. of AI&DS, Methodist College of Engineering, Hyderabad, India

Dr Diana Moses, Professor, Dept. of CSE, Methodist College of Engineering and Technology, Hyderabad, India

### **ABSTRACT**

This investigation presents a comprehensive assessment of the 2023 ICC Cricket World Cup through the application of Tableau-driven visualisation techniques. The research utilises an extensive repository of match-level data, incorporating team identities, venue locations, game outcomes, and victory margins alongside individual accolades and scoring statistics. The primary objective is to transform raw sports records into sophisticated analytical narratives via interactive dashboards and specialised visual frameworks.

A diverse array of methodologies, such as bar charts, trend lines, heatmaps, and highlight tables, were employed to measure team efficiency, stadium-specific influences, and player impact. Findings suggest that **India and South Africa** maintained elite performance levels, characterised by high cumulative runs and authoritative winning margins. Spatial analysis revealed distinct scoring trends across host grounds, while athlete-specific metrics identified key performers whose contributions were fundamental to their squads' success.

The study demonstrates how quantitative modelling distils complex datasets to support enhanced strategic planning in the field of **sports analytics**. These results underscore the vital role of visualisation tools in identifying performance patterns and optimising decision-making within the modern professional landscape.

## Introduction

The dataset used for this project is situated within the **sports analytics sector**, focusing on granular match attributes such as participant teams, scoring totals, venues, and various success indicators. Sports analytics is a rapidly evolving discipline that integrates data processing and visual storytelling to derive objective conclusions from historical performance records.

This field has become increasingly indispensable in our data-driven era, with professional organisations relying on these insights to drive tactical and operational choices. By mapping match statistics visually, trends in competitive dominance, victory probability, individual masterclasses, and regional venue effects can be more precisely interpreted and disseminated.

The data repository offers significant advantages to multiple stakeholders. **Athletes and coaching staff** leverage these trends to evaluate skill sets and address specific performance gaps. **Management teams and analysts** utilise this information for squad selection and strategic planning. **Supporters and media outlets** gain a more profound perspective on game statistics, enhancing fan engagement and appreciation. Furthermore, **students and researchers** find value in applying analytical methods to real-world datasets to refine their technical expertise.

Key groups active within this analytical framework include:

- Professional franchises and international sports clubs
- Coaches and technical support personnel
- Statistical analysts and sports researchers
- Media networks and broadcasting corporations

- Fan bases and global sporting communities

Over the past fifty years, cricket has shifted from a traditional, endurance-based pastime into a high-speed global entertainment industry. Originally defined by the technical demands of Test matches, the sport transitioned through One Day Internationals and T20 cricket, becoming more aggressive and condensed to attract a vast global audience. Modernization via data analytics and technological aids like the Decision Review System has further elevated performance standards and accuracy.

In the context of India, cricket has evolved into a fundamental pillar of national identity. The iconic 1983 World Cup victory under Kapil Dev acted as a catalyst for widespread popularisation, while legendary figures such as Sachin Tendulkar and Virat Kohli solidified India's global standing. The inception of the IPL revolutionised the landscape by merging athletics with commercial success. Today, India is a dominant force in international cricket, characterised by advanced infrastructure and a steady pipeline of elite talent.

### Literature Survey

1. Research conducted by **Sanjay Kumar et al.** analysed machine learning models to forecast player performance during the 2023 ODI tournament. By testing various algorithms, the authors identified precise methods for predicting individual impact using historical data like batting and bowling averages. Their results suggest that these computational tools provide a strong, data-driven foundation for modern scouting and selection processes.
2. In their investigation, **Swamynathan et al.** employed Support Vector Regression to identify MVPs in T20 cricket. The framework used key stats like total runs and match influence to show how predictive models optimise team selection. This research demonstrates how advanced analytics can pinpoint high-value players through objective performance metrics.
3. The study by **Bonya Broti Mondal et al.** utilised the TOPSIS methodology to rank teams and predict outcomes for the 2023 World Cup. By combining criteria like

world rankings and scoring history, the research provided a structured way to identify frontrunners. These findings confirm that multi-criteria decision-making tools are effective for evaluating team strength in professional tournaments.

4. Focusing on the T20 World Cup, **Anupam Tiwari** examined how AI can improve victory predictions through the analysis of historical match data and player trends. The study used various machine learning structures to enhance the accuracy of match forecasting. This work highlights the increasing integration of artificial intelligence within the field of sports statistical analysis.

5. The collaborative research of **Kuldeep Dahal and Sanjib Choudhury** applied factor analysis to evaluate skill sets across different match formats. Their study identified benchmarks like economy rates and strike consistency to establish a robust statistical framework. This allows for a detailed assessment of player efficiency relative to the specific demands of international competition.

6. Using heuristic optimisation, **Subhasis Ray and Soma Roychowdhury** analysed game strategies and team compositions via Markovian equilibrium. Their mathematical approach sought to maximise team results by identifying optimal batting and bowling combinations. The study shows how quantitative models serve as an essential resource for tactical planning in high-level cricket.

7. The statistical analysis by **M. Bailey and S.R. Clarke** offered a systematic method for measuring the dominance of international teams. By reviewing historical outcomes and bowling performance, the researchers developed a way to assess parity and future success. These findings suggest that standardised metrics are vital for understanding competitive balance on a global scale.

8. A ranking framework for athletes based on objective match contributions was introduced by **H.H. Lemmer**, focusing on impact and consistency. The study highlights the shift toward using quantifiable data to drive player evaluation and team selection. The results support the necessity of statistical evidence in professional team management.

9. The well-known Duckworth-Lewis method, by **F.C. Duckworth and A.J. Lewis**, continues to be a staple of sports statistics for managing weather-interrupted matches. This tool calculates fair targets by balancing available overs and wickets. Its global use

demonstrates the value of mathematical modelling in ensuring competitive fairness during unpredictable events.

10. Through data mining techniques, **A. Kaluarachchi and A. Varde** analysed match outcomes using large datasets of team and player statistics. Their project focused on building predictive models that provide better clarity into game dynamics. The research concludes that these analytical methods are indispensable for gaining high-value insights into sports forecasting.

## Methods and Materials

### ABOUT DATASET:

The information utilised for this research is sourced from **Kaggle** and contains thorough details regarding cricket competitions. It includes specific match-level data such as participants, venues, scores, and match results, making it ideal for visual exploration and performance analysis.

The data set comprises roughly **18 variables (columns)** and **48 entries (rows)**. Of these, **3 variables are quantitative** (including match numbers, runs, and wickets taken), **14 are categorical** (such as team names, results, venue locations, and player awards), and **1 variable is dedicated to temporal information** (the match date). The focus is on metrics like cumulative runs and winning margins to provide analytical conclusions.

In terms of spatial attributes, the data includes **city names and specific venue identifiers** for all matches played. However, it **excludes exact coordinate data** like latitude and longitude, which restricts geographical mapping to the city level. Even so, these attributes are vital for identifying regional performance trends and stadium-specific outcomes.

### INTRODUCTION TO TABLEAU:

Tableau is recognised as a leading **business intelligence and data visualisation** tool in the industry today. It allows users to turn complex, raw information into dynamic and compelling visual stories. Through its simple drag-and-drop interface, users can build

sophisticated analytics without requiring intensive programming knowledge. As a result, it is widely adopted by analysts and researchers to drive insights and strategic decisions.

A major benefit of Tableau is its ability to connect to various data sources, including local files, databases, and cloud-based platforms. Once the data is connected, it can be easily filtered and represented through different styles such as **heat maps, bar charts, and trend lines**. These visualisations are key to discovering hidden patterns, performance shifts, and data outliers that might not be visible in standard tables.

In this analysis, Tableau was utilised to investigate the **ICC Cricket World Cup 2023** using interactive dashboards. The visualisations were designed to assess team performance, venue-specific statistics, individual player records, and overall tournament trends. Features like tooltips and custom filters were used to enable a more detailed study of the data and improve the analytical process.

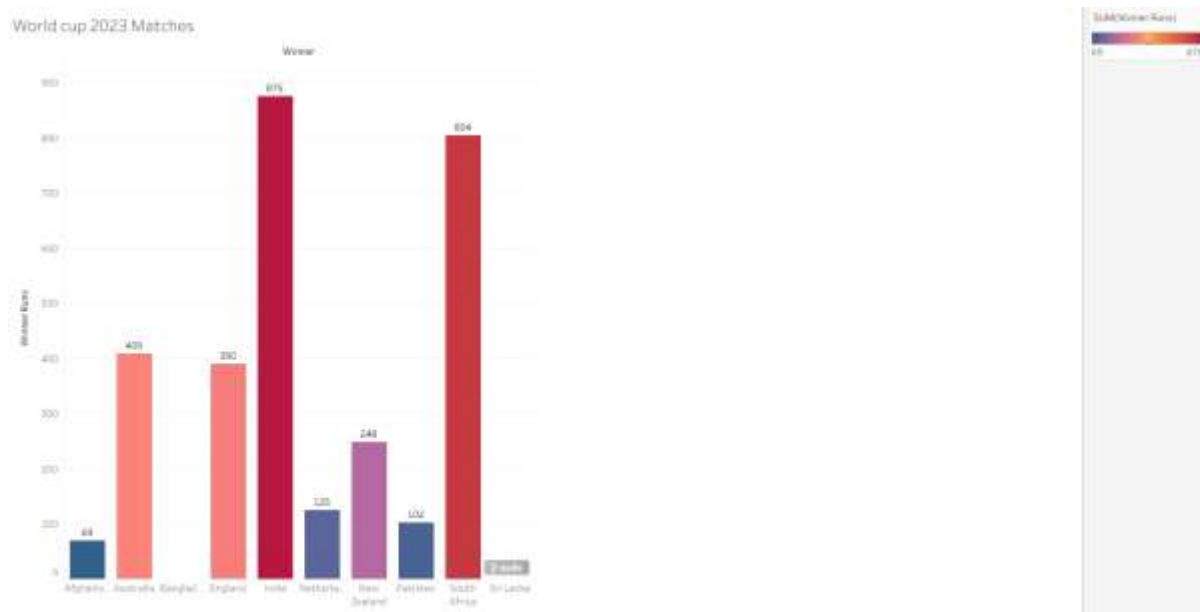
Furthermore, Tableau's **dashboard features** allow for combining multiple charts into one interactive interface. This was vital for the project, enabling the comparison of team standings, venue impacts, and player achievements at the same time. This integrated approach ensures that various aspects of the data are viewed together in a cohesive context.

To conclude, Tableau is essential in **modern data analytics**, transforming raw data into clear visual insights. Its powerful functionality and accessible design make it a crucial tool for sports analytics and strategic planning. By using these methods, this study successfully converted raw match data into valuable conclusions about the World Cup tournament.

## **Analysis And Discussion**

### Comparative Batting Dominance

### Chart 1: Comparative Batting Dominance



The illustrated bar chart evaluates team efficiency across the 2023 tournament based on cumulative scoring in victorious matches. Each vertical entry distinguishes a specific nation, where the bar elevation corresponds to the total runs achieved during their successful outings. Visual evidence confirms that squads like **India and South Africa** maintained high performance standards, consistently recording substantial totals. Conversely, participants such as Afghanistan and the Netherlands displayed relatively condensed scoring patterns. This visual narrative facilitates an efficient comparison of competitive dominance and highlights the superior batting caliber of the frontrunners throughout the championship.

### Chart 2: Bowling Proficiency and Wicket Distribution



This analytical highlight table measures bowling proficiency by examining the wickets secured by winning sides. Through varied color saturation, the chart identifies teams with high impact; deeper tones signify a larger volume of wickets, while lighter shades represent fewer dismissals. The metrics indicate that **India** emerged as a significant bowling force, frequently dismantling opposition lineups in their triumphs. This visualization provides a clear perspective on defensive strength, allowing for a rapid assessment of which bowling units were most effective in driving match outcomes.

### Chart 3: Heatmap of Run Totals by Winning Squad



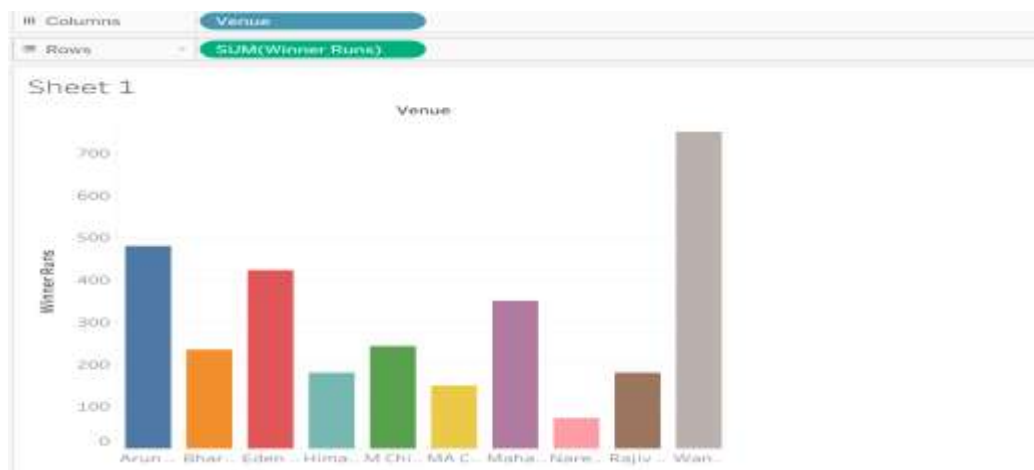
The following heatmap offers a systematic review of run totals for each winning squad in the tournament archive. By mapping team identities against run metrics, the visualisation uses chromatic density to denote scoring magnitude—darker regions highlight elite batting performances. The data pinpoint **India and South Africa** as the primary scoring leaders, while teams like the Netherlands and Afghanistan exhibited lower statistical footprints. This format serves as a robust analytical tool for identifying outliers and recognising consistent performance patterns across the global field.

**Chart 4: Regional Analysis of Victory Margins by City**



This regional analysis examines how victory margins differ across various host cities. The results suggest that **Mumbai** served as a hub for high-scoring encounters, closely followed by metropolitan centers like Delhi and Kolkata. In contrast, Ahmedabad recorded the most conservative winning scores among the identified locations. These trends clarify the influence of geographical venue on match dynamics, highlighting specific urban centres where teams achieved their most aggressive batting results.

**Chart 5: Venue-Specific Scoring Variations**



The provided bar chart details the scoring variations observed across specific tournament grounds. Notably, the **Wankhede Stadium** emerged as the premier venue for expansive

batting displays, hosting numerous high-total victories. Significant run aggregates were also observed at the **Arun Jaitley Stadium** and **Eden Gardens**, while the **Narendra Modi Stadium** registered lower winning margins. This venue-level exploration identifies regional hotspots for performance and confirms that specific stadium conditions played a vital role in determining scoring outcomes.

**Chart 6: Correlation of Player of the Match Accolades with Run Margins**



Individual impact is assessed here by correlating **Player of the Match** accolades with victory run margins. The findings highlight that **Mohammed Shami** was pivotal in matches featuring high winning scores, with athletes such as **H Klaasen**, **Q de Kock**, and **TM Head** also delivering standout performances. While many players provided steady contributions, these specific masterclasses were frequently the primary catalysts for their team's tactical success and dominant scoreboard presence.

VENUE-SPECIFIC PERFORMANCE ANALYSIS

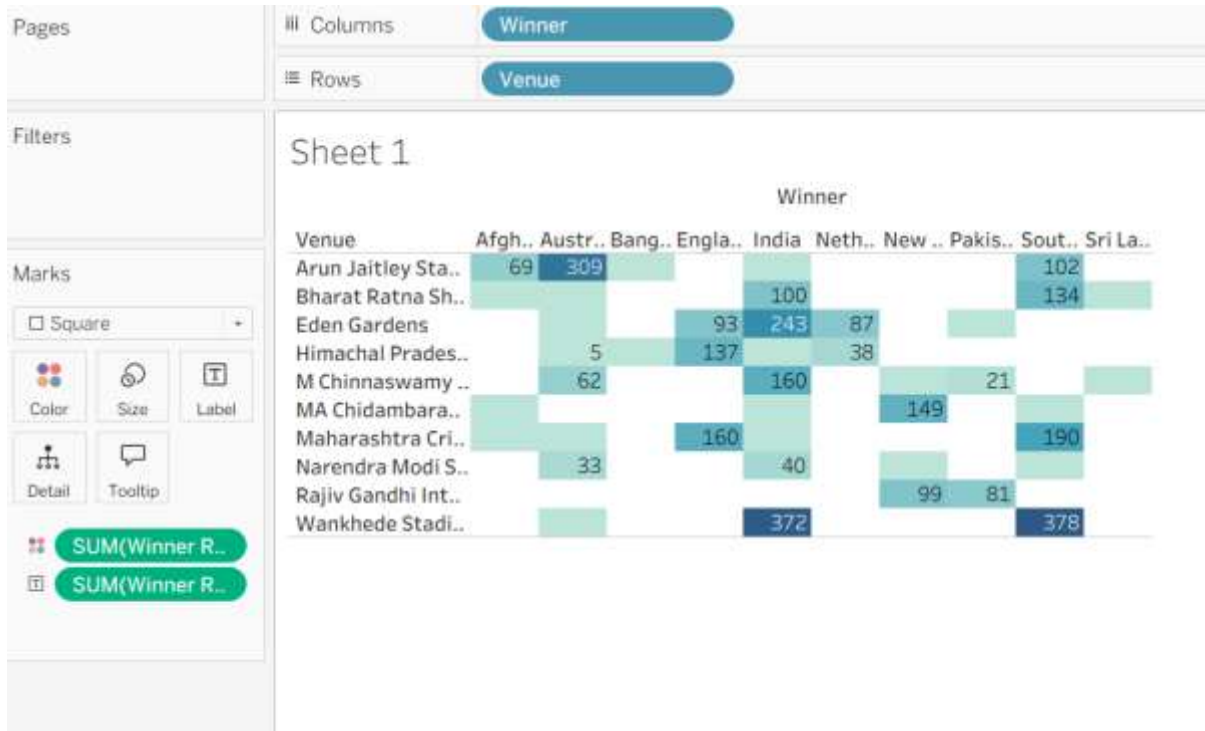


Chart 7: Winner Runs by Stadium and Squad

This specialized highlight table maps the distribution of **winner runs relative to specific stadium locations and squads**. Darker visual markers indicate superior scoring feats, revealing that **South Africa and India** achieved their most dominant results at grounds like the **Wankhede Stadium** and the **Maharashtra Cricket Association Stadium**. This integrated view clarifies how team efficiency was often optimized at particular venues, illustrating the intersection of team strategy and regional stadium dynamics.

CHRONOLOGICAL TREND ANALYSIS

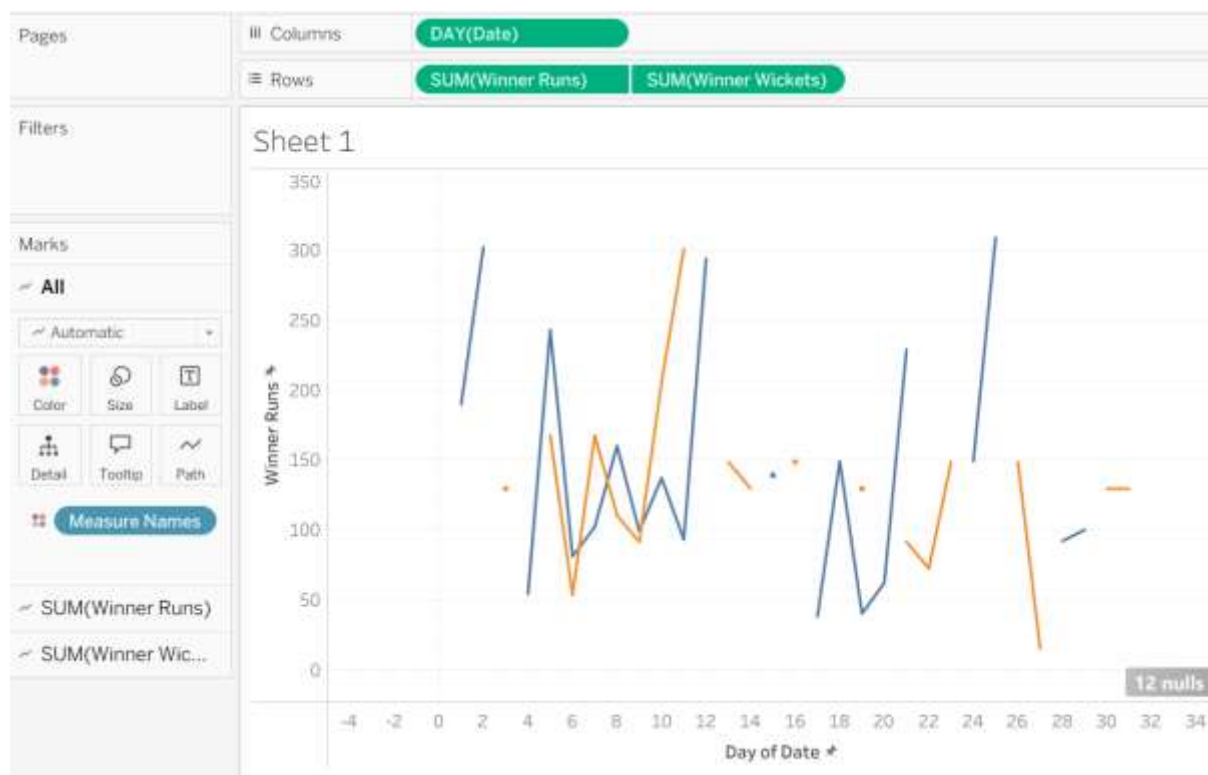


### Chart 8: Chronological Trend Analysis of Tournament Scoring

The illustrated line chart tracks the trajectory of **tournament scoring patterns over the 2023 schedule**. The trend indicates a steady escalation in winning scores from early October, peaking significantly toward the month's conclusion. Subsequently, the scoring margins entered a period of decline through November, reaching a cyclical low in the tournament's final stages. This temporal analysis suggests that teams achieved their highest offensive efficiency during the mid-tournament phase.

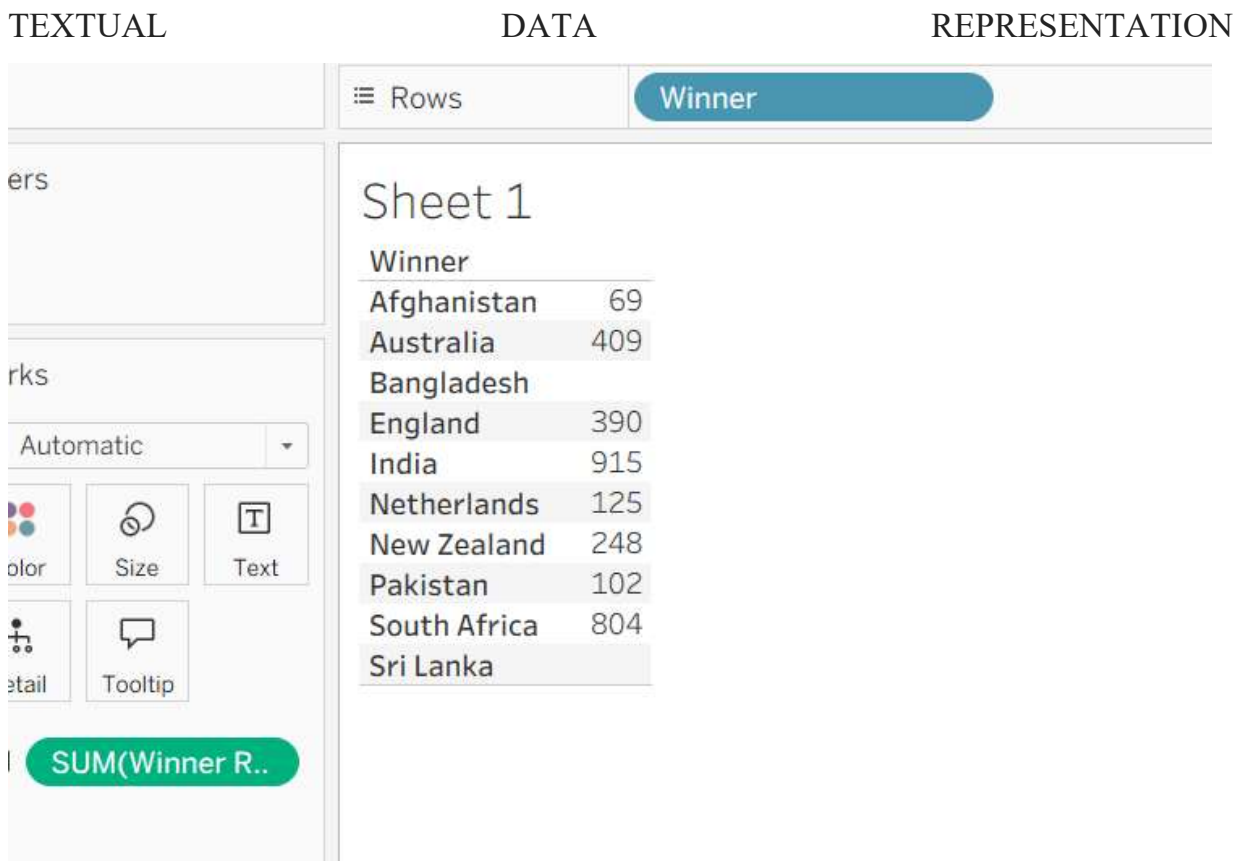
### Chart 9: Integrated Batting and Bowling Performance Metrics

INTEGRATED PERFORMANCE METRICS



This dual-axis visualization compares **batting totals and bowling impact across match days**. The fluctuations observed throughout the championship indicate that different phases were defined by either scoring dominance or bowling precision. While wicket-taking remained relatively consistent, run peaks on specific dates suggest that batting conditions played a disproportionate role in those particular outcomes. The chart

effectively captures the shifting competitive balance between bat and ball during the competition.



**Chart 10: Aggregate Winning Run Margins**

This visual summary quantifies the aggregate winning run margins achieved by each participant in the ICC Cricket World Cup dataset. It serves as a benchmark for comparing national success through the lens of victory disparity.

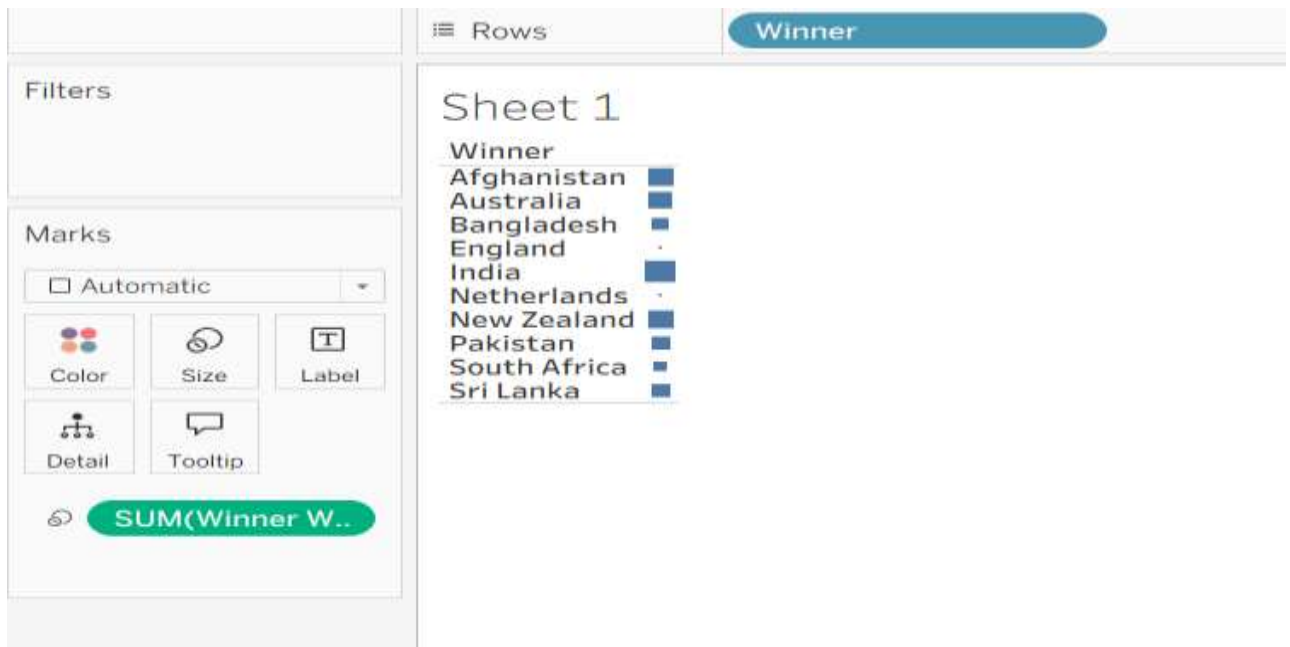
Statistical review confirms that **India** led the field with a total of 915 winning runs, followed closely by **South Africa** at 804. Australia and England also demonstrated competitive strength with totals of 409 and 390 runs, respectively. In contrast, teams such as Pakistan, Afghanistan, and the Netherlands recorded more modest cumulative margins.

The data identifies India and South Africa as the most authoritative teams in terms of securing convincing, high-margin victories. These elevated metrics are indicative of elite level execution and consistent tactical dominance throughout the tournament cycle.

Ultimately, this representation offers a transparent ranking of team parity, pinpointing the squads that maintained the highest performance standards across the championship.

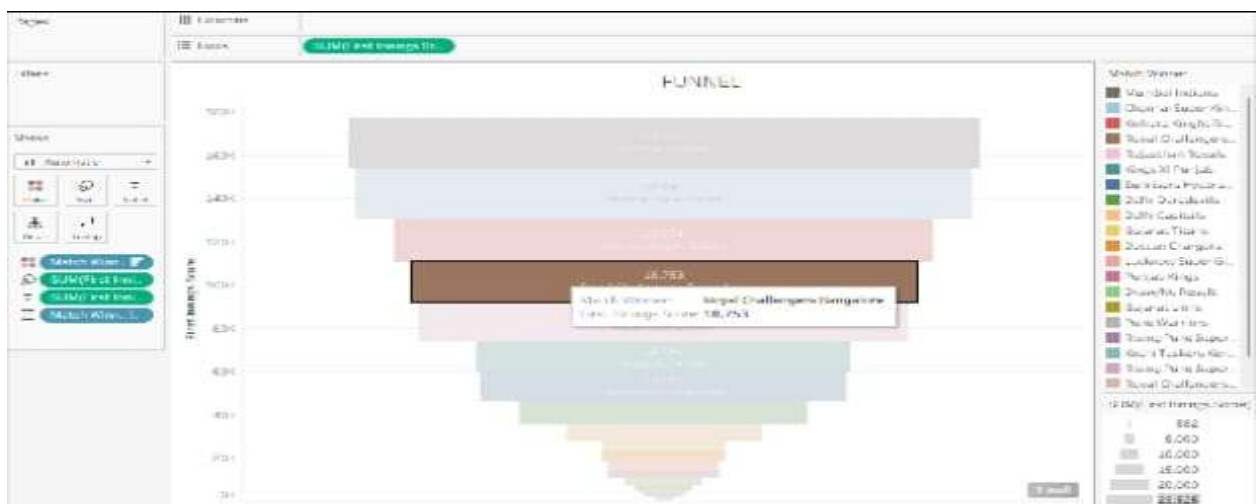
SPATIAL SCORING DENSITY

**Chart 11: Spatial Scoring Density Analysis**



COMPETITIVE SUCCESS FUNNEL

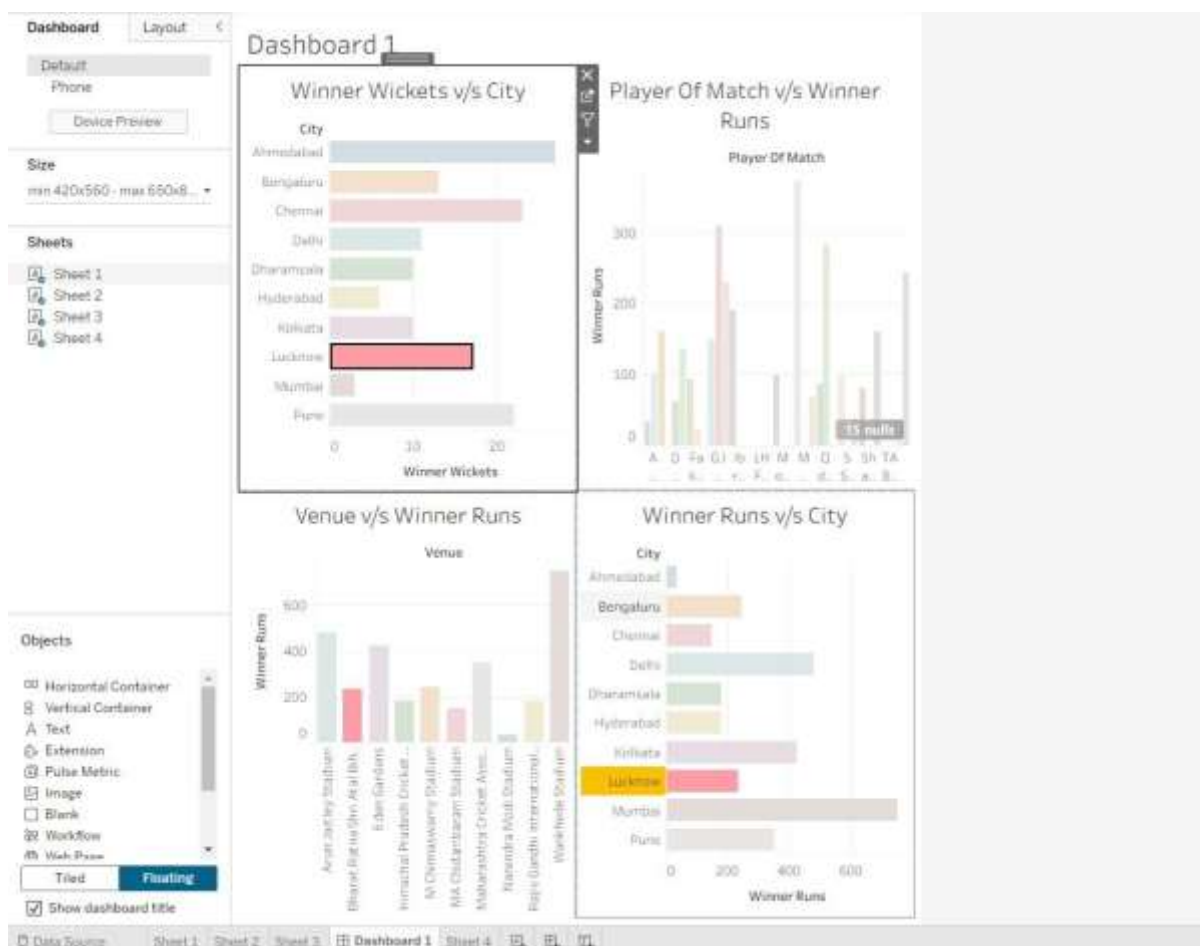
**Chart 12: Competitive Success Funnel**



This funnel visualization illustrates the distribution of match victories across the international field. Segment width reflects the cumulative win count for each nation, with the most triumphant teams positioned at the top. This structured approach simplifies the comparison of team efficacy and clearly identifies the most successful franchises throughout the World Cup tournament.

### ANALYTICAL DASHBOARD I

**Chart 13: Analytical Dashboard: Scoring and Bowling Metrics**



The primary dashboard integrates four distinct visualizations to evaluate scoring margins, bowling metrics, and athlete impact across metropolitan host sites. By implementing interactive highlight actions centered on the **City** variable, users can isolate specific

regional data—such as Lucknow—to observe its performance footprint across all charts. This functionality preserves the broader dataset for context while enabling precise comparative research, ensuring the analytical process remains both efficient and cohesive.

## ANALYSIS AND DISCUSSION

The dataset concerning the **2023 ICC Cricket World Cup** offers a comprehensive archive of match-specific attributes recorded throughout the tournament. Key variables include team identities, geographical host cities, stadium locations, and granular details like toss outcomes, final winners, and individual player accolades alongside victory margins. This specific information repository was selected for the Tableau exploration as it provides a multifaceted range of data types suitable for advanced visual interpretation and analytical modeling. By leveraging this content, the project successfully mapped team efficiency and highlighted pivotal competitive milestones observed across the championship duration.

The initial analytical phase prioritized team efficiency metrics. Through the implementation of bar graphs, the study facilitated a direct comparison of success rates between competing nations. These findings revealed that India maintained a period of high dominance during the group stages, whereas Australia demonstrated tactical consistency that ultimately culminated in their World Cup triumph. Furthermore, the strong competitive standings of South Africa and New Zealand added significant depth and parity to the international tournament.

An additional investigative focus examined the **correlation between toss decisions** and eventual game outcomes. Visual evidence suggested a prevalent trend where captains favoured bowling first upon winning the toss. Nevertheless, the analytical charts confirmed that securing the toss was not a guaranteed predictor of victory. Multiple instances occurred where squads overcame an initial toss loss to secure a win, reinforcing the conclusion that strategic execution and collective performance are more critical factors than pre-match coin flips.

Spatial visualisations at the venue and city levels provided clarity on the tournament's logistical framework. Diverse metropolitan hubs across India served as hosts for various fixtures, showcasing the immense scale of the event's organisation. The use of specialised charts and maps enabled an efficient comparison of match distribution across different stadiums, pinpointing regional centres of activity throughout the host nation.

An evaluation of victory margins offered insights into the competitive balance of the matches. The data illustrated a spectrum of intensity, ranging from high-stakes, closely contested encounters to matches defined by substantial scoring disparities. This analysis successfully identified both dominant team performances and instances of intense parity, highlighting the varying levels of execution between professional squads during the competition.

Individual player impact was assessed through **Player of the Match** statistics. Specific athletes were recognised multiple times for their exceptional batting, bowling, or versatile all-round contributions. These individual masterclasses were frequently identified as the primary drivers behind their teams' tactical advancement and success in critical tournament phases.

In summary, the Tableau-based visualisations transformed raw sporting records into accessible analytical narratives. The project enhanced the understanding of team trajectories, result trends, venue influences, and individual achievements. It further validates Tableau as a robust instrument for sports statistical analysis, capable of presenting complex information through a clear and interactive visual lens.

## CONCLUSION

This project has successfully utilised Tableau to interpret the 2023 ICC Cricket World Cup data through an analytical framework. A variety of visualisation strategies were employed to examine team standings, stadium influences, individual impact, and broader tournament patterns. The results indicate that India and South Africa were notably dominant, characterised by high cumulative runs and consistent performance standards.

These visual tools have provided critical insights into how variables like geographical venue, athlete contribution, and specific match dynamics shaped the outcomes. The use of interactive dashboards facilitated a multifaceted exploration of the data, allowing for efficient comparative analysis from diverse viewpoints.

Ultimately, this research highlights the role of Tableau in the field of **modern sports analytics**. By converting extensive raw datasets into meaningful visual summaries, the project supports enhanced performance assessment and informed strategic planning within the professional sports landscape.

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