ELECTVIZ - ELECTION DATA VISUALIZATION FOR MEDIA

INFOSYS SPRINGBOARD INTERNSHIP 6.0

Final project report

By – Team C
1. Ashish Ransing (Team Leader)
2. N. Manjushri
3. PD. Varshita
4. Pratham S. Salian
5. Deepika Kanukanthi

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Project Overview

The primary objective of the **ElectiViz** project is the engineering and deployment of a broadcast-quality Election Intelligence Dashboard, specifically architecturalized for the high-pressure environments of newsrooms and professional media analytics. Far exceeding the capabilities of conventional corporate reporting, this "Command Center" is built on the strategic pillars of real-time processing speed, compelling visual storytelling, and high-impact data communication.

This project centers on a comprehensive **5-page interactive dashboard** designed to deliver a seamless **"Macro-to-Micro"** analytical narrative. To power this system, the platform ingests and standardizes two primary high-volume datasets:

- **'indian-national-level-election.csv' (covering Lok Sabha data from 1977 to 2014).**
- **'indian-state-level-election.csv' (comprising detailed Vidhan Sabha data).**

By processing over **400,000** granular records spanning nearly four decades of Indian political history, the platform converts vast quantities of raw data into actionable election intelligence.

The dashboard serves as a critical strategic asset for media analysts, enabling them to instantly synthesize national trends, conduct deep-dives into regional battlegrounds, and evaluate political performance through custom-engineered metrics—such as Strike Rate, Winning Margin, and Voter Turnout %—that are not found in raw datasets. Through this rigorous analytical implementation, **ElectiViz** uncovers the underlying efficiency patterns and demographic shifts that ultimately dictate the success or failure of political campaigns.

Project Objectives And Teck Stack

❖ **Project objectives:**

1. **Historical Archiving:** To standardize and visualize over 400,000 election records from 1977 to 2014.

2. **Metric Innovation:** To engineer "hidden" metrics not found in raw data, such as **Strike Rate**, **Winning Margin**, and **Voter Turnout %**.

3. **Media-Ready Storytelling:** To create a visual narrative that supports live reporting, featuring "Nail-Biter" contests, "Landslide" victories, and demographic shifts.

❖ **Teck Stack:**

Layer	Technology Selected	Purpose
ETL & Data Engineering	Python	Core language for data processing and logic.
Data Manipulation	Pandas, NumPy	Used for cleaning, merging, and calculating complex metrics (Margins/Ranks).
Exploratory Analysis	Matplotlib, Seaborn	Used for generating initial statistical visualisations (Box Plots, Histograms).
Visualization / BI	Microsoft Power BI	The primary dashboarding tool for the final user interface.
Data Storage	CSV (Flat Files) / Excel files	Storage for the 400,000+ raw and processed election records.
Asset Management	Microsoft Excel	Used to create the Party_Master dimension table (New data consisting Logos of each Party).
IDE / Environment	Google collab/ Jupyter Notebook	Development environment for writing and testing Python scripts.

Requirement And Backlog Analysis

The project followed a rigorous **Agile methodology**, utilizing a prioritized product backlog to ensure iterative development and alignment with media industry standards. This approach allowed for continuous refining of features based on technical feasibility and analytical depth.

1. **Data Analysis & Feasibility:**
   Before development, a comprehensive analysis of the core datasets was conducted —
   'indian-national-level-election.csv' (Lok Sabha)
   'indian-state-level-election.csv' (Vidhan Sabha)

   - **Gaps Identified:** The raw data was found to be lacking critical derived metrics such as Voter Turnout %, Winning Margin, and Strike Rate, which are essential for broadcast-quality analysis.

   - **Inconsistency Issues:** High levels of naming inconsistency were noted, with political entities like "BJP" and "Bhartiya Janata Party" appearing as separate entries.

   - **Asset Requirements:** It was determined that external media assets (Party Logos and standardized HEX color codes) were missing and needed to be integrated via a custom Party_Master file to meet media-ready standards.

2. **Key Functional Requirements:**
   The product backlog was categorized into high-priority functional modules designed for a "Macro-to-Micro" analytical flow:

   - **Data Standardization:** Mapping and cleaning thousands of historical variations (e.g., "INC(I)", "Congress", "Congress(I)") into a single, unified "INC" entity to ensure temporal accuracy.

   - **National Overview (Macro):** Implementation of a national heat map and majority check donut charts (272 seats) to instantly convey the ruling party's dominance.

   - **State Drill-Down (Micro):** Dynamic filtering capabilities allowing users to isolate specific states (e.g., UP, Bihar, Maharashtra) and view local assembly trends and constituency-level winners.

   - **Candidate Efficiency:** Advanced analysis of Strike Rates and Candidate Win % to determine which political parties ran the most efficient campaigns relative to seats contested.

   - **The "War Room":** A dedicated, high-impact module specifically for media anchors to identify "Nail-Biter" contests (margins < 5,000 votes) and "Landslide" victories (margins > 1L votes).

3. **Non-Functional Requirements:**
   To ensure the dashboard functions as a high-performance "Command Center," the following standards were enforced:

   - **Performance:** Optimization of DAX measures and data modeling to ensure the dashboard can process and load 40 years of massive historical data efficiently.

   - **Usability: A intuitive** "Macro-to-Micro" navigation flow that guides the user from National overview to State deep-dives, and finally to Constituency-level details.

   - **Aesthetics:** Strict adherence to official party color codes and the use of professional typography (e.g., "Bebas Neue") for headline metrics to maintain media consistency.

SYSTEM ARCHITECTURE AND DATA MODELLING

❖ **Objective:** To design and implement a scalable schema facilitating seamless cross-filtering between National (Lok Sabha) and State (Vidhan Sabha) datasets.

❖ **Schema Topology:** Galaxy Schema (Multi-Fact Architecture).

❖ **Fact Tables (Transactional Data):**

    1. **national_cleaned_enriched:** Contains granular Lok Sabha election results.
    2. **state_cleaned_enriched:** Contains granular Vidhan Sabha election results.

❖ **Dimension Tables (Lookup Masters):**

    3. **Dim_State:** Standardized state list ensuring accurate geolocating and filtering across maps.
    4. **Dim_Year:** Unified timeline dimension for temporal analysis.
    5. **Party_Master:** Centralized branding repository containing Party Codes, Names, Logos, and standardized HEX Colors.

❖ **Relationship Logic:** One-to-Many relationships established between Dimension and Fact tables, ensuring that slicers (Year, State) operate dynamically across all report pages.
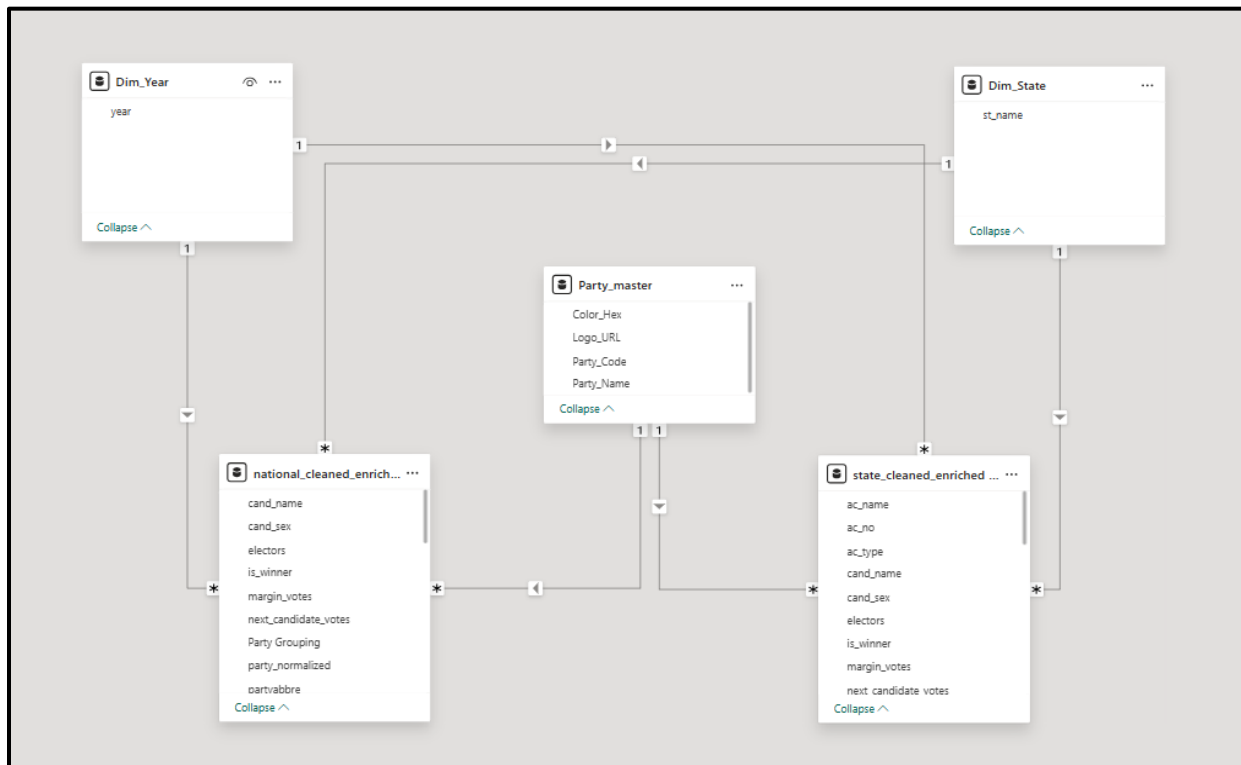

Fig 1 : Data Model Architecture

Advanced Implementation & Dax Dictionary

❖ **Development Status:** Completion of 28+ complex measures enabling the "War Room" logic and "Efficiency" analysis. Below are all the advanced formulas implemented

MEASURE NAME	DAX FORMULAS
Nat Total Seats Won	Nat Total Seats Won = CALCULATE(COUNTROWS('national_cleaned_enriched'), 'national_cleaned_enriched'[is_winner] = 1)
Nat Total Votes	Nat Total Votes = SUM('national_cleaned_enriched'[totvotpoll])
Nat Avg Turnout %	Nat Avg Turnout % = AVERAGE('national_cleaned_enriched'[turnout_pct])
Nat Total Candidates	Nat Total Candidates = COUNTROWS('national_cleaned_enriched')
Nat Total Parties	Nat Total Parties = DISTINCTCOUNT('national_cleaned_enriched'[party_normalized])
State Total Seats Won	State Total Seats Won = CALCULATE(COUNTROWS('state_cleaned_enriched'), 'state_cleaned_enriched'[is_winner] = 1)
State Total Votes	State Total Votes = SUM('state_cleaned_enriched'[totvotpoll])

State Avg Turnout %	State Avg Turnout % = AVERAGE('state_cleaned_enriched'[turnout_pct])
State Total Candidates	State Total Candidates = COUNTROWS('state_cleaned_enriched')
State Total Parties	State Total Parties = DISTINCTCOUNT('state_cleaned_enriched'[party_normalized])
Nat Seats Contested	Nat Seats Contested = COUNTROWS('national_cleaned_enriched')
Nat Strike Rate %	Nat Strike Rate % = DIVIDE([Nat Total Seats Won], [Nat Seats Contested], 0)
Nat Vote Share %	Nat Vote Share % = VAR PartyVotes = [Nat Total Votes] VAR AllVotes = CALCULATE([Nat Total Votes], ALL('national_cleaned_enriched'[party_normalized])) RETURN DIVIDE(PartyVotes, AllVotes, 0)
State Seats Contested	State Seats Contested = COUNTROWS('state_cleaned_enriched')
State Strike Rate %	State Strike Rate % = DIVIDE([State Total Seats Won], [State Seats Contested], 0)
State Vote Share %	State Vote Share % = VAR PartyVotes = [State Total Votes] VAR AllVotes = CALCULATE([State Total Votes], ALL('state_cleaned_enriched'[party_normalized])) RETURN DIVIDE(PartyVotes, AllVotes, 0)

State Avg Win Margin	State Avg Win Margin = CALCULATE(AVERAGE('state_cleaned_enriched'[margin_votes]), 'state_cleaned_enriched'[is_winner] = 1)
Nat Avg Win Margin	Nat Avg Win Margin = CALCULATE(AVERAGE('national_cleaned_enriched'[margin_votes]), 'national_cleaned_enriched'[is_winner] = 1)
Nat Close Contests	Nat Close Contests = CALCULATE([Nat Total Seats Won], 'national_cleaned_enriched'[margin_votes] < 5000, 'national_cleaned_enriched'[is_winner] = 1, 'national_cleaned_enriched'[margin_votes] > 0)
Nat Landslide Victories	Nat Landslide Victories = CALCULATE([Nat Total Seats Won], 'national_cleaned_enriched'[margin_votes] >= 100000, 'national_cleaned_enriched'[is_winner] = 1) + 0
Margin Category	Margin Category = SWITCH(TRUE(), 'national_cleaned_enriched'[margin_votes] < 5000, "1. Nail Biter", 'national_cleaned_enriched'[margin_votes] < 20000, "2. Close Fight", 'national_cleaned_enriched'[margin_votes] < 100000, "3. Safe Seat", 'national_cleaned_enriched'[margin_votes] >= 100000, "4. Landslide", "Other")
Nat Female Candidates	Nat Female Candidates = CALCULATE(COUNTROWS('national_cleaned_enriched'), 'national_cleaned_enriched'[cand_sex] = "F")
Nat Female Winners	Nat Female Winners = CALCULATE([Nat Total Seats Won], 'national_cleaned_enriched'[cand_sex] = "F")
Nat Female Success Rate	Nat Female Success Rate = VAR Candidates = [Nat Female Candidates] VAR Winners = [Nat Female Winners] RETURN IF(Candidates = 0, 0, DIVIDE(Winners, Candidates, 0))
Nat Winner Name	Nat Winner Name = VAR TopParty = TOPN(1, VALUES('national_cleaned_enriched'[party_normalized]), [Nat Total Seats Won], DESC) RETURN CONCATENATEX(TopParty, 'national_cleaned_enriched'[party_normalized], ", ")

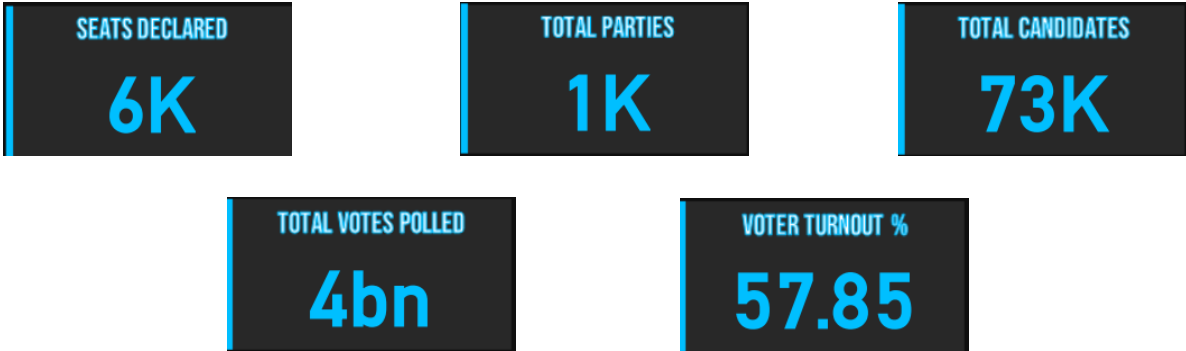|	
Nat Winner Color	Nat Winner Color = VAR TopPartyTable = TOPN(1, VALUES('national_cleaned_enriched'[party_normalized]), [Nat Total Seats Won], DESC) VAR TopPartyName = MAXX(TopPartyTable, 'national_cleaned_enriched'[party_normalized]) VAR RealColor = LOOKUPVALUE('Party_Master'[Color_Hex], 'Party_Master'[Party_Code], TopPartyName) RETURN COALESCE(RealColor, "#808080")
State Winner Name	State Winner Name = VAR TopParty = TOPN(1, VALUES('state_cleaned_enriched'[party_normalized]), [State Total Seats Won], DESC) RETURN CONCATENATEX(TopParty, 'state_cleaned_enriched'[party_normalized], ', ")
State Winner Color	State Winner Color = VAR TopPartyTable = TOPN(1, VALUES('state_cleaned_enriched'[party_normalized]), [State Total Seats Won], DESC) VAR TopPartyName = MAXX(TopPartyTable, 'state_cleaned_enriched'[party_normalized]) VAR RealColor = LOOKUPVALUE('Party_Master'[Color_Hex], 'Party_Master'[Party_Code], TopPartyName) RETURN COALESCE(RealColor, "#808080")

Dashboard Visualization

The dashboard is organized into five specialized modules to support comprehensive election reporting.

1. **National Command Center:** Visualizes parliamentary majority checks and geographic dominance maps.

2. **State Battlegrounds:** Deep-dives into regional assembly results and leadership stability timelines.

3. **Party Strategy & Performance:** Uses an Efficiency Matrix (Scatter Plot) to evaluate campaign effectiveness.

4. **Demographic Analysis:** Tracks voter turnout heatmaps and the historical "Gender Gap" in candidacy vs. wins.

5. **Election War Room:** A specialized view for real-time reporting on "Nail Biters" and "Fortress" seats

All the dashboard pages and their respective visuals are explained in upcoming pages.

Page 1: National Election Command Center

- ❖ **Theme:** "The Macro View"
- ❖ **Strategic Purpose:** A high-level executive dashboard designed to instantly visualize the status of the central government, parliamentary majority, and geographic dominance.
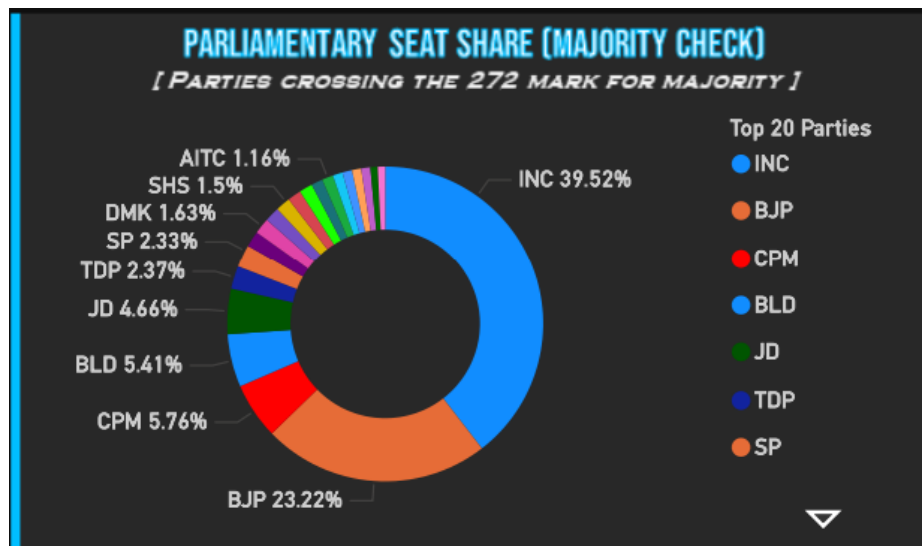
Visual Component	Type	Configuration & Logic	Strategic Rationale
Global Controller	Slicer	Field: Dim_Year[year]	Acts as a "Time Machine," allowing stakeholders to switch context between election cycles (e.g., 1984 vs. 2014) to analyze historical shifts.

YEAR

All

Visual Component	Type	Configuration & Logic	Strategic Rationale
Headline KPIs	5-Card Layout	Metrics: Seats Declared, Total Votes, Voter Turnout, Total Parties, Total Candidates.	Provides an immediate "Health Check" of the election scale and participation levels before users navigate to complex analytics.

SEATS DECLARED
6K

TOTAL PARTIES
1K

TOTAL CANDIDATES
73K

TOTAL VOTES POLLED
4bn

VOTER TURNOUT %
57.85

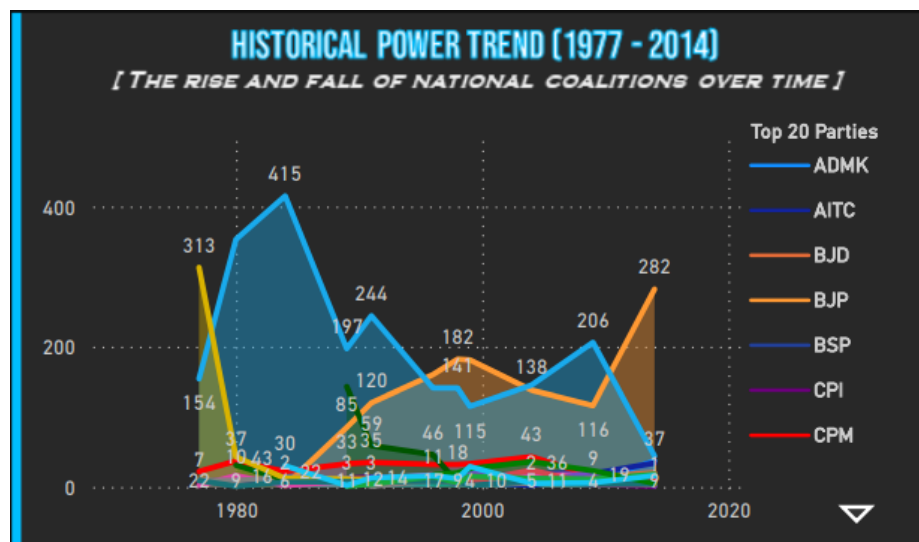|			
Majority Gauge	Donut Chart	Legend: Party_Code Values: Nat Total Seats Won	Instantly answers the critical question: "*Did any party cross the majority mark (272)?*" visually representing the parliament floor.

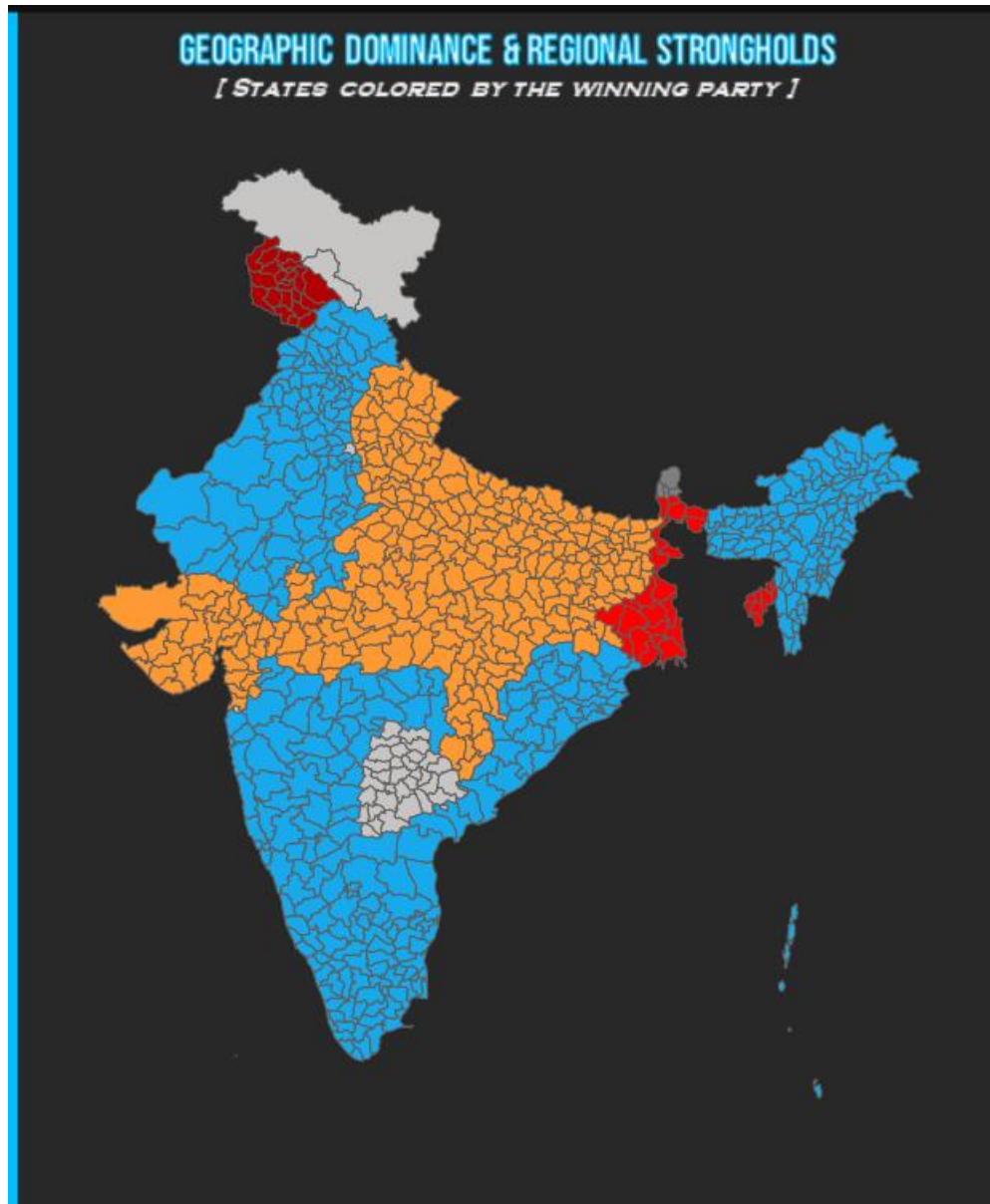|			
Trend Analysis	Line Chart	Axis: Year Values: Seats Won	Contextualizes the current result, distinguishing between sudden "Waves" and long-term organic growth patterns since 1977.

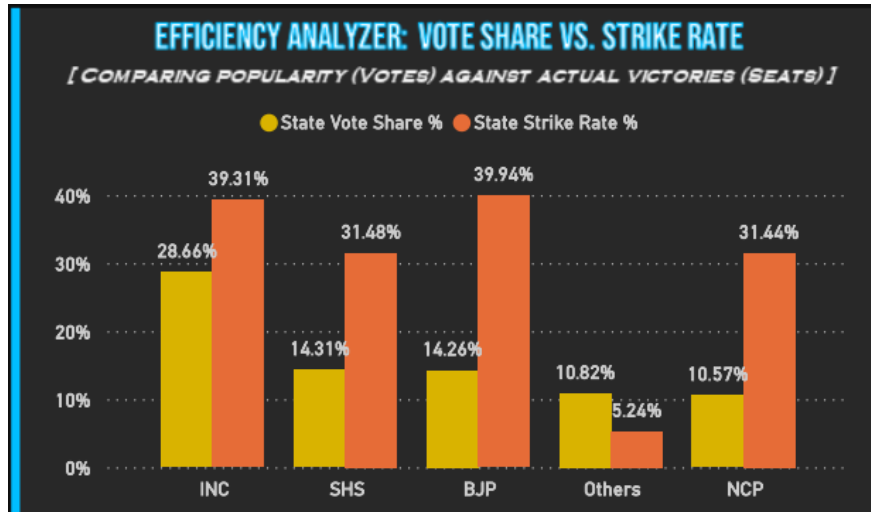| Geographic Map	Shape Map	Loc: Dim_State Color: Nat Winner Color	Visualizes "Regional Strongholds," revealing North-South or East-West political divides using official party colors.

GEOGRAPHIC DOMINANCE & REGIONAL STRONGHOLDS
[STATES COLORED BY THE WINNING PARTY]

Page 2: State Battlegrounds
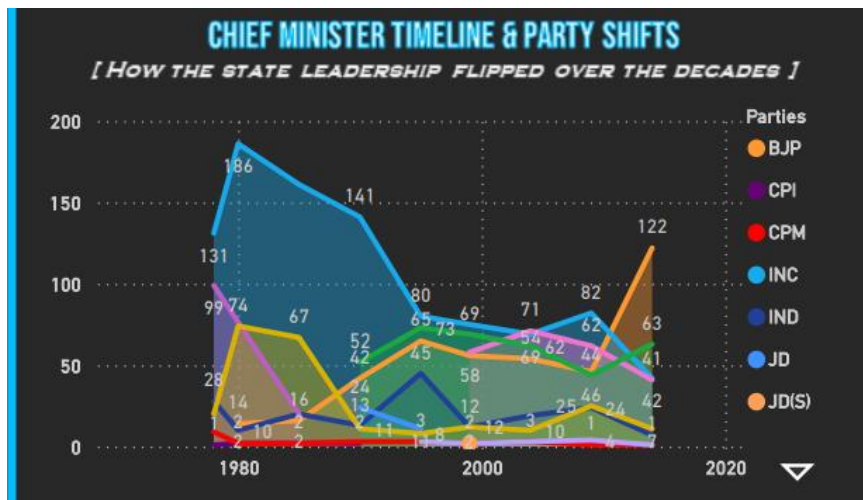
❖ **Theme:** "The Regional Deep Dive"

Strategic Purpose: A granular analysis tool for specific Legislative Assembly (Vidhan Sabha) results, focusing on local efficiency and leadership stability.

Visual Component	Type	Configuration & Logic	Strategic Rationale
Dual Controllers	Slicer	Fields: Dim_State, Dim_Year	Enables drill-down capabilities, allowing users to isolate specific regions (e.g., Uttar Pradesh) and specific assembly terms.

YEAR: All
STATE: Maharashtra

Visual Component	Type	Configuration & Logic	Strategic Rationale
Regional KPIs	5-Card Layout	Metrics: Assembly Seats, State Votes, State Turnout, Local Parties, Candidates.	Resets the analytical context from "National" to "Local" metrics immediately upon state selection.

ASSEMBLY SEATS	TOTAL PARTIES	TOTAL CANDIDATES
3K	192	27K

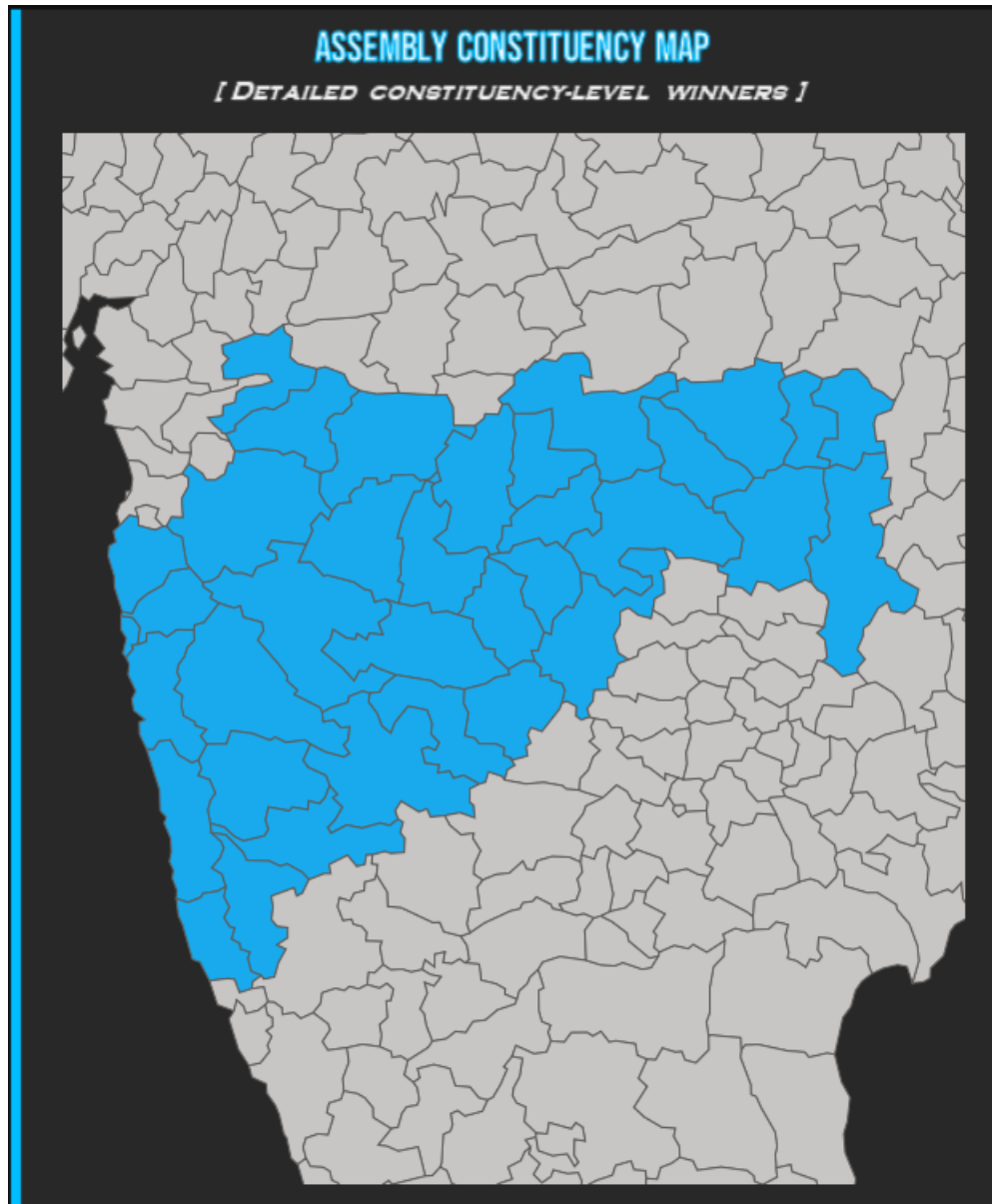| TOTAL STATE VOTES	STATE VOTES TURNOUT %
301M	62.72

Efficiency Analyzer	Clustered Column	Y-Axis: Vote Share % vs. Strike Rate %	Exposes "First Past the Post" realities by comparing Popularity (Votes) against Efficiency (Seat Conversion Rate).

EFFICIENCY ANALYZER: VOTE SHARE VS. STRIKE RATE
[COMPARING POPULARITY (VOTES) AGAINST ACTUAL VICTORIES (SEATS)]

● State Vote Share % ● State Strike Rate %

Party	Vote Share	Strike Rate
INC	28.66%	39.31%
SHS	14.31%	31.48%
BJP	14.26%	39.94%
Others	10.82%	5.24%
NCP	10.57%	31.44%

Leadership Timeline	Line Chart	Axis: Year Values: Seats Won	Visualizes "Anti-Incumbency" trends, tracking how frequently a state flips its ruling party over decades.

CHIEF MINISTER TIMELINE & PARTY SHIFTS
[HOW THE STATE LEADERSHIP FLIPPED OVER THE DECADES]

Parties
● BJP
● CPI
● CPM
● INC
● IND
● JD
● JD(S)

Assembly Map	Shape Map	Loc: Dim_State Color: State Winner Color	Displays "Micro-Level" dominance, revealing distinct voting belts (e.g., rural vs. urban) within the selected state.

ASSEMBLY CONSTITUENCY MAP
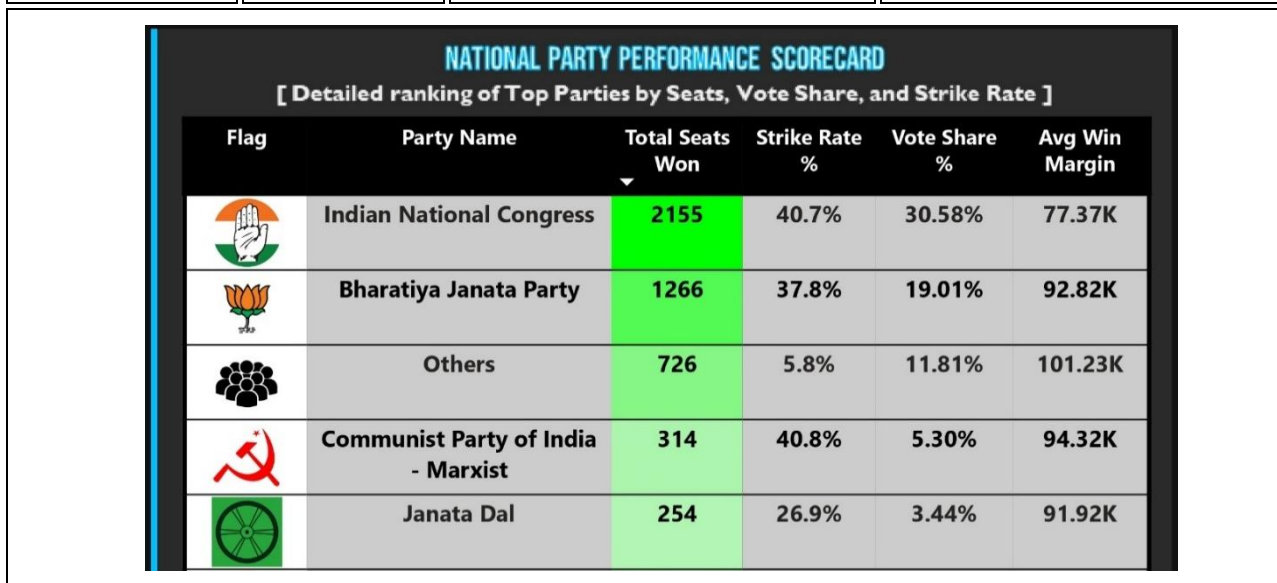[DETAILED CONSTITUENCY-LEVEL WINNERS]

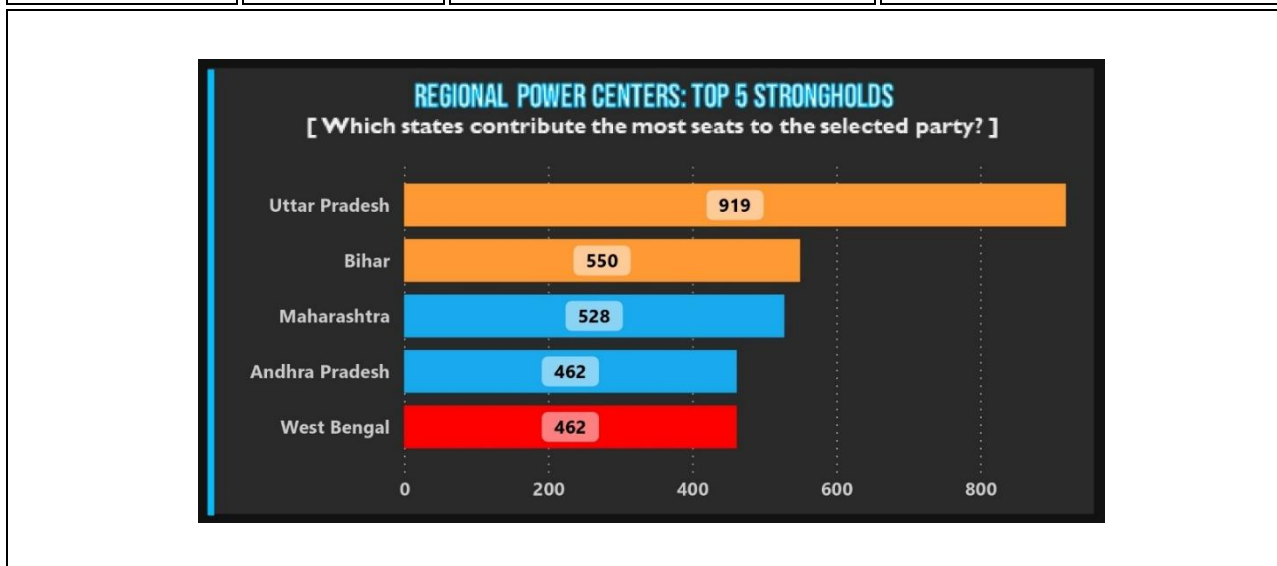# Page 3: Party Strategy & Performance Analysis

- ❖ **Theme:** "The ROI of Politics"
- ❖ **Strategic Purpose:** To move beyond simple seat counts and evaluate the "efficiency" of political campaigns, helping analysts distinguish between mass popularity and actual electoral convertibility.

Visual Component	Type	Configuration & Logic	Strategic Rationale
Global Controller	Slicer	Fields: Dim_Year, Party_Master[Party_Name]	Enables deep-dive analysis into specific political entities, filtering out noise from hundreds of smaller parties.

YEAR	PARTY
All ⌄	All ⌄

Visual Component	Type	Configuration & Logic	Strategic Rationale
Efficiency Matrix	Scatter Plot	X-Axis: Vote Share % Y-Axis: Strike Rate % Values: Party Name	Visualizes the "Conversion Rate" of votes to seats. It exposes parties that may have high popularity (Vote Share) but fail to win seats due to poor vote concentration.

EFFICIENCY MATRIX: POPULARITY VS. STRIKE RATE %
[Comparing Vote Share % (X-Axis) against Win Efficiency % (Y-Axis)]

Party Name
- AAAP
- ADMK
- AGP
- AITC
- BJD
- BJP
- BSP
- CPI

Performance Scorecard	Table	Columns: Flag, Party Name, Total Seats Won, Strike Rate %, Vote Share %, Avg Win Margin.	Provides a "Hard Data" lookup for journalists who need precise numbers (e.g., exact Strike Rate percentages) rather than just visual trends.

NATIONAL PARTY PERFORMANCE SCORECARD
[Detailed ranking of Top Parties by Seats, Vote Share, and Strike Rate]

Flag	Party Name	Total Seats Won ▼	Strike Rate %	Vote Share %	Avg Win Margin
	Indian National Congress	2155	40.7%	30.58%	77.37K
	Bharatiya Janata Party	1266	37.8%	19.01%	92.82K
	Others	726	5.8%	11.81%	101.23K
	Communist Party of India - Marxist	314	40.8%	5.30%	94.32K
	Janata Dal	254	26.9%	3.44%	91.92K

Regional Power Centers	Bar Chart	Axis: State Name Values: Total Seats Won Filter: Top 5 States by Seat Contribution.	Identifies the geographic "Base" of a party. It answers whether a party is a true national force or heavily reliant on a few specific states.

REGIONAL POWER CENTERS: TOP 5 STRONGHOLDS
[Which states contribute the most seats to the selected party?]

State	Seats
Uttar Pradesh	919
Bihar	550
Maharashtra	528
Andhra Pradesh	462
West Bengal	462

Page 4: Demographic Analysis: Gender & Turnout

❖ **Theme:** "The Social Health Check"

❖ **Strategic Purpose:** To analyze the human element of the election, specifically correlating voter participation with outcomes and measuring the progress of gender inclusivity in Indian politics.

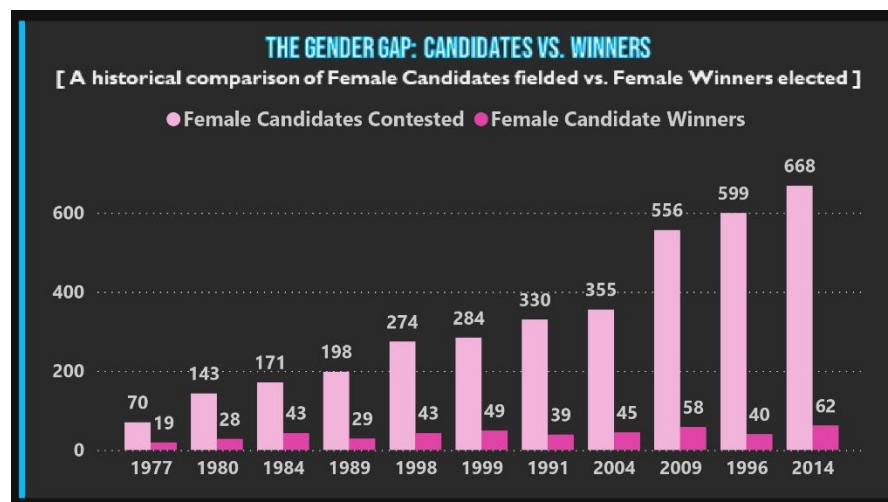| Visual Component	Type	Configuration & Logic	Strategic Rationale
Context Controllers	Slicer	Fields: Dim_Year, Dim_State	Facilitates comparison between different states or time periods to track demographic shifts.

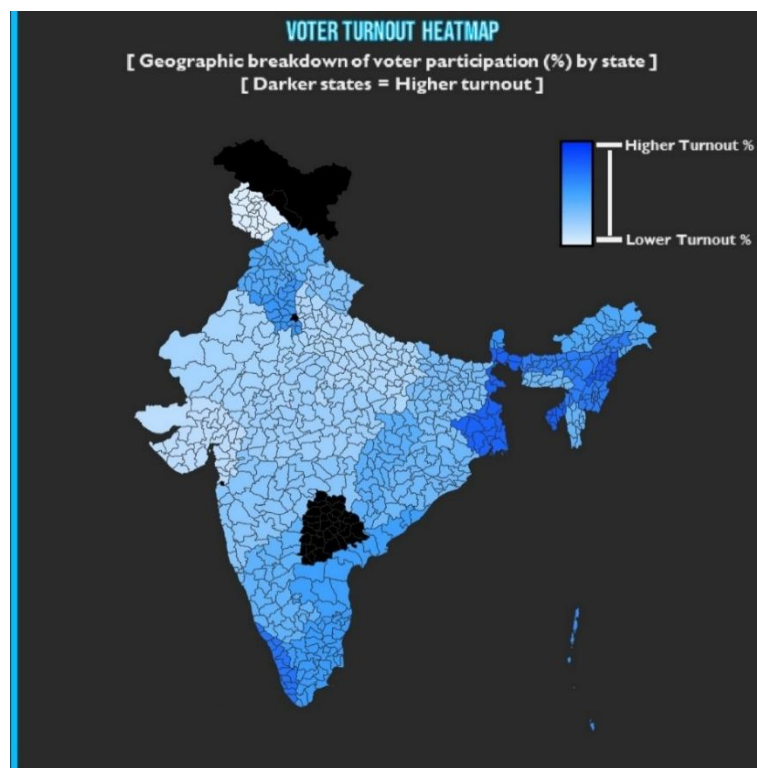| Visual Component	Type	Configuration & Logic	Strategic Rationale
The Gender Gap	Clustered Bar	X-Axis: Year Y-Axis: Count Legend: Female Candidates Contested vs. Female Winners.	Reveals the "Drop-off Effect." It proves that while more women are contesting elections (Pink bars rising), the number of actual winners is not growing at the same linear pace.

Female Success Rate	Gauge Chart	Value: [Female Success Rate %] Target: 33% (labeled "Nari Shakti Adhiniyam").	Sets a clear policy benchmark, highlighting the gap between current female representation and the proposed 33% legislative target.

FEMALE CANDIDATE SUCCESS RATE %

Current win rate vs. the proposed 33% Reservation Target (Nari Shakti Adhiniyam)

33.00%

12.47%

0.00% 100.00%

Turnout Heatmap	Shape Map	Loc: Dim_State Saturation: [Nat Avg Turnout %] Gradient: Light Blue (Low) to Dark Blue (High)..	Instantly highlights regions with high civic engagement. Darker states indicate a more politically active electorate, often correlating with anti-incumbency waves.

VOTER TURNOUT HEATMAP

[Geographic breakdown of voter participation (%) by state]
[Darker states = Higher turnout]

Higher Turnout %

Lower Turnout %

Page 5: Election War Room: Margin Analysis

- ❖ **Theme:** "Critical Alerts & Volatility"
- ❖ **Strategic Purpose:** A high-stakes command center designed for live reporting. It isolates "At-Risk" seats to identify where the election hung by a thread versus where it was a one-sided wave.

Visual Component	Type	Configuration & Logic	Strategic Rationale
Global Controller	Slicer	Field: Dim_Year[year]	Acts as a "Time Machine," allowing stakeholders to switch context between election cycles

		YEAR		
		All		

Visual Component	Type	Configuration & Logic	Strategic Rationale
Volatility Alerts	KPI Cards	Metrics: [Close Contests (<5k)] vs [Landslide Victories (>1L)].	The Headline Stat: These big numbers instantly segregate "Safe" seats from "Nail Biters."

CLOSE CONTESTS
[MARGIN <5K]
262

LANDSLIDE VICTORIES
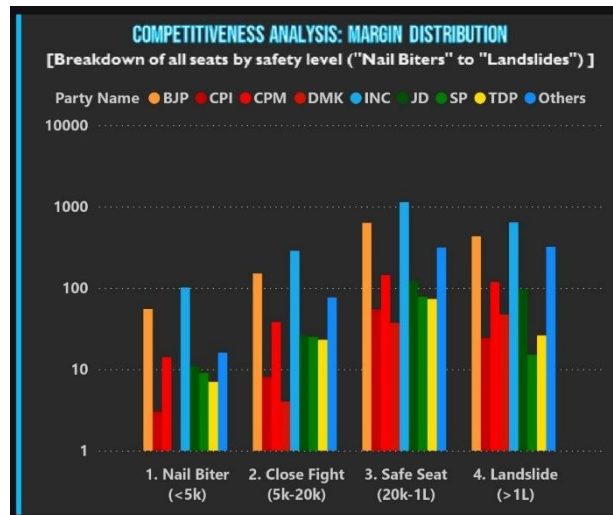**[MARGIN >1L]**
2K

Competitiveness Analysis	Clustered Bar	Axis: Safety Category (Nail Biter, Close Fight, Safe Seat, Landslide) Values: Seat Count.	Profiles the "Intensity" of the mandate. It visually answers whether the election was a tight race or a decisive landslide.

The Nail Biters	Table	Filter: Margin < 5,000 votes. Formatting: Red background for Margin Votes column.	The Watchlist: Lists specific constituencies that are vulnerable to flipping. Essential for identifying swing seats..

The Fortresses	Table	Filter: Margin > 100,000 votes. Formatting: Green background for Margin Votes column.	Identifies "Unshakable" strongholds where the winner dominated the opposition completely.

THE FORTRESSES: MARGINS > 1L VOTES

List of decisive landslide victories where the opposition was crushed.

Flag	Party	Constituency	State	Margin Votes
	CPM	Jhargram	West Bengal	1991032
	CPM	Burdwan	West Bengal	1902834
	BJP	Gandhinagar	Gujarat	1870694
	CPM	Tripura East	Tripura	1603199
	CPM	Arambagh	West Bengal	1594335
	CPM	Tripura West	Tripura	1493622
	NPF	Nagaland	Nagaland	1335265
	NCP	Baramati	Maharashtra	1128428
	INC	Nagaland	Nagaland	1103568
	JD	Hajipur	Bihar	1095992

Testing & Validation

Overview: Given the complexity of the "War Room" logic and "Efficiency" metrics, a rigorous testing phase was conducted to ensure system integrity.

A. Data Accuracy & Integrity (The "Zero-Loss" Check):

- **Technique:** Aggregate Reconciliation
- **Method:** We implemented a custom "Integrity Check" flag that calculates the absolute difference between the *Sum of Candidate Votes* and the *Total Valid Votes* reported in the source file.
- **Outcome:** Confirmed that row-level candidate data rolls up exactly to the constituency totals, ensuring zero data loss during the ETL process.

B. Logical & Scenario Testing:

- **Technique:** Edge-Case Validation
- **Method:** We manually filtered the dashboard for "Edge Cases"—specifically constituencies with the smallest possible winning margins (double-digit votes).
- **Outcome:** Verified that the conditional formatting logic (Red highlights) correctly triggers at the lower bounds and that the "Nail Biter" category accurately captures these specific anomalies.

C. Interactivity & Context Transition:

- **Technique:** Cross-Filtering Stress Test
- **Method:** We selected specific dimension attributes (e.g., a single Party or State) on the Master pages and navigated to the Detail pages.
- **Outcome:** Confirmed that filter contexts propagate correctly across the Galaxy Schema, ensuring that a "Party" selection correctly filters the "State Strongholds" chart without breaking visual relationships.

D. Temporal Logic Validation:

- **Technique:** Slicer Interaction Testing
- **Method:** Toggled the "Year" slicer across multiple historical election cycles (e.g., comparing 1984 vs. 2014).
- **Outcome:** Validated that complex time-intelligence measures (like historical trend lines) dynamically recalculate and display the correct subset of data for the selected period.

Following are the test cases which were executed during the completion of the dashboard pages –

Test ID	Visual Component	Action Performed	Expected Result	Status
D-01	Donut Chart	Select Year 2014.	BJP slice (Saffron) takes > 50% majority.	Pass
D-02	Line Chart	Clear filters.	Chart shows INC decline & BJP rise (1977-2014).	Pass
F-01	Slicer Logic	Select 2009.	Map updates to Blue (INC); All KPIs refresh.	Pass
F-02	Map Tooltips	Hover on the Map	Tooltip correctly shows data and logos of BJP, INC, Others.	Pass
D-03	KPI Cards	Select Uttar Pradesh.	"Assembly Seats" card shows 80 (Lok Sabha).	Pass
F-03	Map Zoom	Select Kerala.	Map auto-zooms to show only Kerala state shape.	Pass
F-04	Slicer Control	Try selecting 2 states.	System blocks selection (Single Select enforced).	Pass
D-04	Trend Line	Select West Bengal.	Line chart shows CPM dominance until 2009, then AITC.	Pass

D-05	Scatter Plot	Select BJP (2014).	Single dot in Top-Right quadrant (High Efficiency).	Pass
D-06	Matrix Table	Check Columns.	Shows Party, Seats, Strike Rate, Vote Share %, Avg Win Margin	Pass
F-05	Regional Bar Chart	Select Shiv Sena.	Top bar is Maharashtra (Stronghold).	Pass
F-06	Filtering	Select 2004.	Chart filters out parties with 0 seats (Noise reduction).	Pass
D-07	Gender Gap Chart	Select Year 2014.	Female Candidates bar (Attempt) >> Winners bar.	Pass
D-08	Success Gauge	Check Gauge Value.	Shows approx 9-12% (Low female success rate).	Pass
F-07	Turnout Map	Hover over Nagaland.	Custom Tooltip appears showing the zoomed-in map.	Pass
F-08	State Filter	Select Kerala.	Gender chart updates to show only Kerala's history.	Pass
D-09	"Nail Biters" Table	Check Margin Column.	All displayed values must be strictly < 5,000 Votes.	Pass

D-10	"Fortresses" Table	Check Margin Column.	All displayed values must be strictly > 1,00,000 Votes.	Pass
F-09	Sorting Logic	Check "Nail Biters" List.	Rows are sorted Ascending (Smallest margin at top).	Pass
F-10	Margin Chart	Click "Landslide" Bar.	The "Fortresses" table filters to show those specific seats.	Pass

Project Conclusion

Project Synthesis and Technical Excellence The development of **ElectiViz** has successfully transformed over 400,000 granular records into a high-performance, broadcast-ready election intelligence platform. By architecturalizing a **Galaxy Schema** and implementing 28+ advanced DAX measures, the project provides deep analytical insights through custom-engineered metrics like **Strike Rate** and **Winning Margin**. The integration of Python-driven normalization ensured that historical data gaps and naming inconsistencies were resolved with professional "Safe-DAX" logic.

Media Impact and Strategic Value Specifically designed for media analysts, the dashboard's "Macro-to-Micro" narrative enables a seamless transition from national majority checks to constituency-level deep dives. High-impact modules like the **Election War Room** provide actionable intelligence by instantly isolating "Nail-Biter" contests and "Fortress" strongholds, making it a critical asset for live reporting .

Final Status and Deployment As of Milestone 4, the system has achieved 100% of its acceptance criteria, with rigorous validation—including **Aggregate Reconciliation** and **Cross-Filtering Stress Tests**—confirming absolute data integrity . The project is fully optimized and ready for final deployment via the **GitHub repository**, marking the successful completion of a scalable, media-grade intelligence solution.

Project Sign-off:

- **Status:** 100% Complete
- **Submission Date:** December 2025