



Exploring people perception towards major political parties during Gujarat (India) Assembly Election campaign

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Abstract

This research article aims to explore the perception of people towards three major political parties (BJP, AAP, and Congress) by using ANOVA analysis. The researcher had collected totally 2999 tweets during Gujarat assembly Election campaign. The study found that there were significant differences in perception towards the BJP, AAP, and Congress, with BJP and AAP being preferred by different segments of the electorate, while BJP and Congress may have similar appeal to voters. The findings may be useful for political parties and election strategists in understanding voter perception and tailoring their campaigns accordingly. The article also reviews previous studies on forecasting election outcomes using sentiment analysis on Twitter data and highlights the advantages and disadvantages of utilizing Twitter data to forecast election outcomes.

Keywords: Twiter Analysis, Election Poll Prediction, Anova.

Introduction

In India, elections are a crucial component of the democratic process, and understanding people perception is essential for predicting election results. Indian elections are highly competitive, with multiple political parties vying for voter attention. In recent years, several new political parties have emerged, challenging the traditional dominance of established parties. Therefore, it is important to investigate the political perception of people towards different political parties. The present study aims to explore the political perception of Indian people towards three major political parties, the Bharatiya Janata Party (BJP), Aam Aadmi Party (AAP), and Indian National Congress (Congress), using ANOVA analysis.

Gujarat Assembly Election 2022: The election for Gujarat Assembly has been announced for 182 assembly seats on November 04, 2022. The Election will be held in two phases on 1 December 2022 and 5 December 2022. In the first phase, election held for 89 seats and second remaining 93 seats going for voting in second phase. During Gujarat election campaign, Political Parties used Social Media as a propaganda tool to get voters' attention.

In India most of political leaders and parties are using Twitter for their election campaign. The election result is announced on December 8, 2023. Totally, 156 seats won by BJP and 17 seats won by Congress. In Gujarat 92 seats needed to form government. In this regard, BJP had enough seats to form the government, but the AAP gave a tough fight to the BJP in many places^{1,2}.

Review of Literature: The results of the 2016 Indian general state elections were predicted using sentiment analysis on Hindi Twitter data in this work by Parul Sharma and Teng-Sheng Moh. The authors identified the sentiment of Twitter users towards each considered Indian political party using supervised and unsupervised methods with three different algorithms. The Bharatiya Janta Party (BJP) was found to have the highest levels of favorable sentiment, and SVM forecasted 78.4% likelihood that the BJP will win more elections in the general election³.

The role of elections as a fundamental aspect of democracy is well-established. Through voting, citizens determine which political party or individual politician will represent them. To gauge likely election outcomes and trends, pre-election polls have been the traditional tool.

However, recent research has indicated that predicting election results based on user activity on Twitter can be a cost-effective alternative. While prior studies have primarily concentrated on utilizing this method in developed countries, where its usefulness is contested, this paper presents a comprehensive argument for applying Twitter-based election forecasting in the developing world.

Using Indonesia's 2014 presidential elections as a case study, the researchers demonstrate that even the most basic Twitter predictor outperforms the majority of traditional polls, while the best-performing predictor surpasses all traditional polls on the national level⁴.

Daniel Gayo-Avello presents a meta-analysis of the current state of electoral prediction using Twitter data in this article. In order to clarify the primary methodologies used up until this point, as well as their shortcomings, he analyses existing research and suggests a strategy to categorise Twitter prediction methods. The study finds that while social media may give a peek of election results, there is currently insufficient evidence to support its replacement of traditional polls. The author contends that additional research on this subject and a tighter integration with conventional election forecasting research is needed⁵.

The systematic mapping study (SMS) aims to identify, categorize, and provide an extensive overview of the approaches, techniques, and tools employed in predicting election results on Twitter. The study examines works published between January 2010 and January 2021, identifying 787 related studies, of which 98 primary studies were selected based on inclusion/exclusion criteria.

The results indicate that most studies utilized sentiment analysis (SA), followed by volume-based and social network analysis (SNA) approaches. The majority of studies employed supervised learning techniques, particularly lexicon-based SA, volume-based, and unsupervised learning. Additionally, 18 types of dictionaries were identified. The analysis covered elections in 28 countries, with a majority focusing on the United States (28%) and India (25%). It was also found that 50% of the primary studies analyzed English tweets. Academic organizations and conference venues were found to be the most active in this domain.

In conclusion, the study shows that SA has been the most popular approach in predicting election outcomes on Twitter over the past 11 years. The utilization of SNA techniques is lower in comparison to SA. Additionally, there is a lack of appropriately labeled political datasets, particularly in languages other than English, indicating a need for the employment of deep learning methods to improve predictions⁶.

In the realm of politics, understanding public opinion is crucial for shaping effective campaign strategies. Sentiment analysis of social media data is widely regarded as a valuable tool for monitoring user preferences and inclinations. However, accurate sentiment analysis relies on supervised learning algorithms such as Naive Bayes and SVM, which necessitate labeled training data. The accuracy of these algorithms hinges on the quantity and quality of the training data, including relevant features and contextual relevance. Unfortunately, scarcity of training data often leads to cross-domain sentiment analysis, resulting in the omission of target data-relevant features and a decline in overall text classification accuracy. This paper introduces a two-stage framework that overcomes these challenges by leveraging mined Twitter data to create training data that upholds features and contextual relevance. Furthermore, a scalable machine learning model is proposed for election result prediction using this two-stage framework⁷.

In the realm of election monitoring and prediction, Twitter sentiment analysis has gained popularity due to its real-time nature and cost-effectiveness. Existing research primarily focuses on explicit mining of public sentiment using lexical and syntactic features in tweets, while neglecting the underlying implicit word relations and co-occurrences. This challenge becomes more complex when dealing with short-length tweets that have limited word capacity.

To address this issue, we propose a novel approach called Hybrid Topic-Based Sentiment Analysis (HTBSA) for capturing word relations and co-occurrences in short tweets to predict election outcomes. The method involves extracting latent topics from a diverse corpus of short texts using the Biterm Topic Model (BTM). Then learn sentiments for each topic using established lexical resources. Finally, we calculate the sentiment score of each tweet by considering the sentiment orientation and weight of the topics it contains.

The study employs a dataset of over 300,000 tweets collected during the Uttar Pradesh (U.P) legislative elections from 1st to 20th February 2017, leveraging geo-tagging for non-exclusive election-related keywords. Results demonstrate the superior performance of HTBSA compared to existing Twitter-based election prediction techniques, with a 3.5% decrease in Mean Absolute Error (MAE). This approach offers a scalable and efficient method for real-time election monitoring and future prediction applications⁸.

The use of Twitter for predicting X has gained popularity in the Twitter research subculture, with electoral prediction being particularly appealing and extensively studied. However, this research problem is not only interesting but also highly challenging. A notable concern is that many authors seem more focused on claiming positive results rather than providing robust and replicable methodologies.

Furthermore, recent papers tend to highlight studies supporting the idea that Twitter is a reliable predictor of elections, overlooking potential limitations. This is problematic because the predictive power of Twitter in electoral contexts has often been exaggerated, and there are still significant research challenges to be addressed. It is crucial to approach this topic with a balanced perspective, considering the complexity of the task and the need for rigorous methodologies⁹.

Detecting negation signals and determining their scope in text is a critical task in information extraction. In this paper, we introduce a machine learning system that effectively identifies the scope of negation in biomedical texts. The system utilizes a combination of classifiers and operates in two phases. To assess the robustness of our approach, we evaluate the system on three subcorpora of the BioScope corpus, which represent various text types. Our system achieves state-of-the-art results for this task, significantly reducing errors by 32.07% compared to existing approaches.

This research contributes to the advancement of negation scope detection in biomedical texts and demonstrates the effectiveness of our machine learning-based system¹⁰.

Methodology

The study used a cross-sectional data extraction design to collect data from Twitter by using R statistical computing language and Twitte R Packages. Totally, 2999 Tweets collected for analysis which expressed political perception towards BJP, Congress, AAP.

To rate the Tweets, the researched had utilized Likert 5 point scale to quantify the data. The researcher engaged 3 coders for code above Tweets. ANOVA analysis was used to determine, whether there were significant differences in mean ratings given to the political parties.

Results and discussion

The examination of mean ratings of political parties, as presented in Table-1, provides a comprehensive overview of public sentiment towards prominent political entities, namely the Bharatiya Janata Party (BJP), Aam Aadmi Party (AAP), and the Indian National Congress.

This analysis, based on responses from a total of 2999 participants, assigns numerical values to the perceived favorability of each political party, shedding light on the nuanced dynamics of public opinion. Following this descriptive exploration, the study employs statistical methodologies to delve deeper into the observed variations.

The Analysis of Variance (ANOVA) results, presented in Table-2, discerns significant differences in mean ratings among the political parties. The variance between groups (political parties) and within groups is carefully dissected, unveiling a noteworthy F-statistic of 13.75 with a p-value of .001, underscoring the statistical significance of the observed differences.

To further scrutinize and contextualize these discrepancies, the Tukey Honestly Significant Difference (HSD) test, outlined in Table-3, serves as a valuable post hoc analysis tool. This test facilitates a nuanced understanding of pair wise mean rating comparisons between political parties.

The results illuminate that while the mean ratings for BJP and AAP, as well as AAP and Congress, exhibit statistically significant differences (p=.001), there is no significant difference between BJP and Congress (p=0.319).

This amalgamation of mean ratings and subsequent statistical analyses offers a comprehensive panorama of the public's perceptions and preferences concerning the political landscape.

The ensuing discussion will delve into the implications of these findings, providing a nuanced understanding of the political dynamics and potential considerations for future political strategies and research endeavors.

Table-1: Mean Ratings of Political Parties.

Political Parties	N	Mean
BJP	999	3.31
AAP	1000	3.08
Congress	1000	3.24
Total	2999	3.21

Table-2: Analysis of Variance (ANOVA) Results.

Groups	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	28.17	2	14.08	13.75	.001
Within Groups	3069.16	2996	1.02		
Total	3097.33	2998			

Table-3: Tukey HSD Test: Mean Rating Comparisons between Political Parties.

	(J) Family	(J) Family	Sig.
Tukey HSD	BJP	AAP	.001
		Congress	0.319
	AAP	BJP	.001
		Congress	0.001
	Congress	BJP	0.319
		AAP	0.001

The mean ratings for the BJP, AAP, and Congress were 3.31, 3.08, and 3.24, respectively. The ANOVA results showed a significant difference in mean ratings given to the political parties (F=13.75, p=.001). Further analysis using Tukey HSD test revealed that the mean ratings for BJP and AAP, as well as AAP and Congress, were significantly different, but there was no significant difference between BJP and Congress.

Discussion: The ANOVA results indicate that there are significant differences in voter preferences for the political parties BJP, AAP, and Congress. The mean ratings suggest that the BJP is the most preferred party, followed by Congress and then AAP. However, the findings from the Tukey HSD test reveal that BJP and AAP have significantly different mean ratings, indicating that these two parties are preferred by different segments of the electorate. In contrast, there is no significant difference between BJP and Congress, suggesting that these two parties may have a similar appeal to voters.

The findings of this study are consistent with previous research that has identified the BJP as a dominant political party in Indian elections. The BJP's popularity can be attributed to several factors, including its nationalist and populist agenda, effective communication strategies, and strong leadership. The AAP's popularity, on the other hand, is based on its anti-corruption platform, welfare schemes, and focus on local issues. The Congress party's appeal lies in its long-standing history and association with the Nehru-Gandhi family, which has been a crucial factor in its survival as a political party.

Limitations: One limitation of this study is that it only focuses on three political parties, which may not be representative of all political parties in the election. Additionally, the study only used one measure of preference, which may not capture the full range of voter attitudes towards the political parties. Future studies should consider including more parties and different measures of people perception to gain a more comprehensive understanding of voter attitudes.

Conclusion

The ANOVA test results indicate that there are significant differences in people perception towards the BJP, AAP, and Congress. The findings suggest that BJP and AAP are preferred by different segments of the electorate, while BJP and Congress may have similar appeal to voters. These findings may be useful for political parties and election strategists in understanding voter perception and tailoring their campaigns accordingly. Future studies should build upon these findings by including more parties and different measures of voter preference. Overall, the study highlights the importance of understanding people perception preferences in Indian elections and its implications for political campaign.

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