In-Depth Analysis of Local Government Public Meetings Transcripts

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Abstract

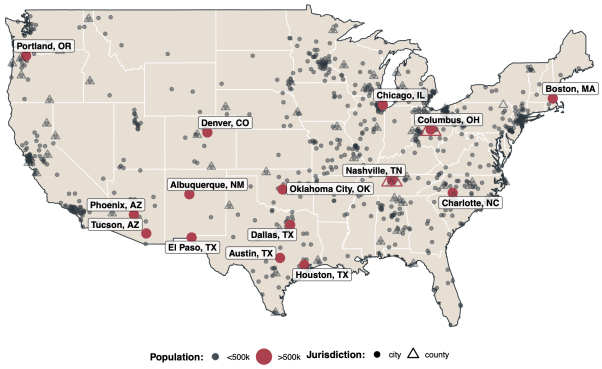
This paper presents a comprehensive analysis of a dataset containing transcripts from local government public meetings in the US. The dataset comprises a diverse collection of meetings from various locations, spanning multiple years. Our work encompasses data preprocessing, exploratory analysis, topic modeling, sentiment analysis, and engagement metrics investigation. We delve into the nuances of meeting frequency, topics of discussion, sentiment trends, and the relationship between meeting duration and audience engagement. Our findings shed light on the dynamics of local government public meetings and offer insights into optimizing engagement and decision-making processes.

1 Introduction

Local government public meetings play a pivotal role in democratic processes, providing a platform for citizens to voice their concerns, interact with officials, and participate in decision-making. In this study, we undertake a multifaceted analysis of a rich dataset of local government public meeting transcripts, focusing on meeting frequency, topics of discussion, sentiment analysis, and engagement metrics.

2 Data Overview and Missing Data Handling

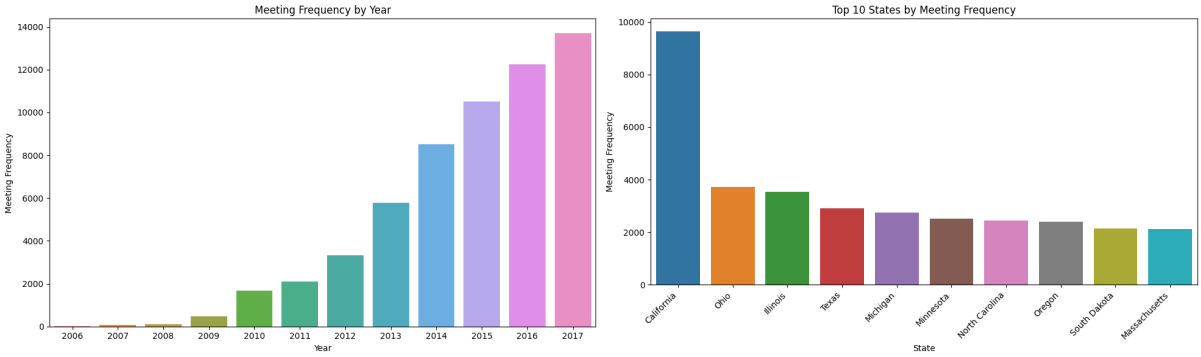
The dataset comprises transcripts from public meetings across diverse locations. The database includes 139,616 videos of public meetings held in 1,012 different locations, involving 2,861 distinct governing bodies across the United States from 2006 to 2022. To ensure data quality, missing data was handled through imputation and validation checks. Text preprocessing techniques were applied to ensure the readiness of the data for subsequent analyses.



3 Analyzing Meeting Frequency

In the review of the meetings frequency we can see from 1a that over the years there was a big raise in the number of meeting over all. From 1b we can see that most of the meeting are in the state of California and then we have a long tail. That may suggest that the majority of data that was added over time is in the state of California. We can also see in the code base that over time more and more states added

their data as the years went on. An initial overview reveals trends in meeting frequency over the years. These findings can also be backed by the over time evaluation we ran in the code attached. There we can see in the animation that not only the number of meeting raised but also the number of the unique states in the dataset. By aggregating meetings by state, we identified the top 10 states with the highest meeting frequencies. This offers insights into the geographic distribution of meetings engagement.



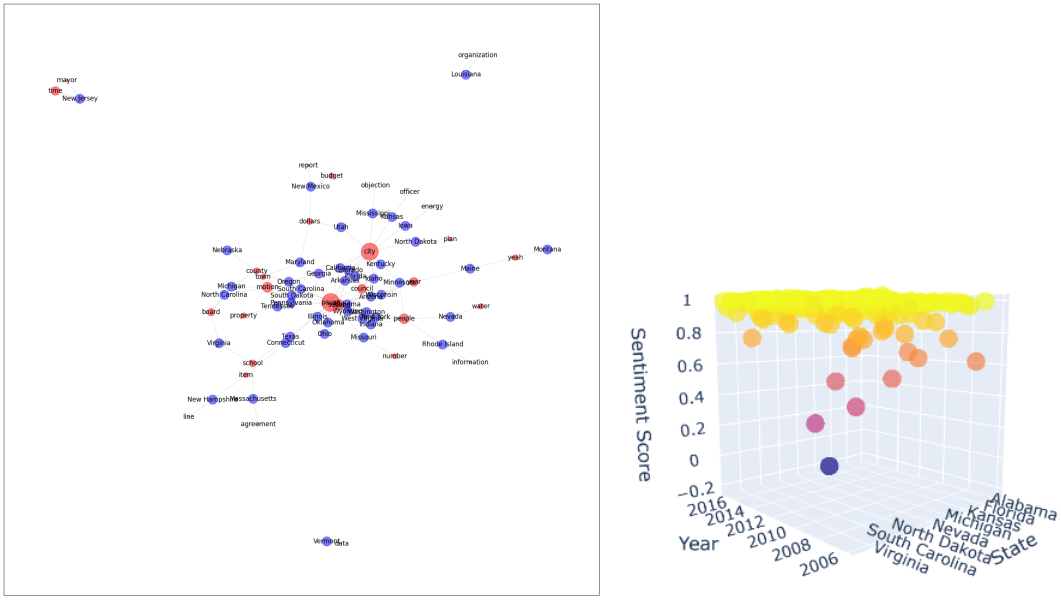
(a) meeting frequencies over the years

(b) meeting frequencies by states

Figure 1: Meeting frequencies

4 Topic Analysis

In our pursuit of analyzing the meeting topics, we sought to visualize this information through a graph format, wherein prevalent phrases from the data are depicted as topic nodes, while states are represented as a separate set of nodes. As illustrated in 2a, it becomes apparent that numerous states exhibit substantial associations with governmental procedural language, as highlighted in 3 word cloud visualization. Interestingly, distinct inclinations emerge, underscoring the unique interests of certain states. For instance, within the context of New Mexico, fiscal matters encompassing concepts like "dollars" and "budget" take prominence, while in the state of Nevada, a pronounced emphasis on water-related subjects is discernible. This graphical representation offers an insightful means of unraveling the intricate interplay between states' preferences and overarching governmental themes discussed in meetings.



(a) states topics graph

(b) sentiment over year by state

Figure 2: sentiment and topic analysis

5 Sentiment Analysis

Sentiment analysis of meeting transcripts offers insights into public sentiment on various topics. Using the Vader Sentiment Analyzer, we calculated sentiment scores. Figure 2b shows that the majority of meetings generally express positive sentiment. However, a negative sentiment stands out in Louisiana in 2017. Additionally, relatively neutral sentiment appears in 2009 for Wisconsin and Pennsylvania.

6 Word Cloud Visualization

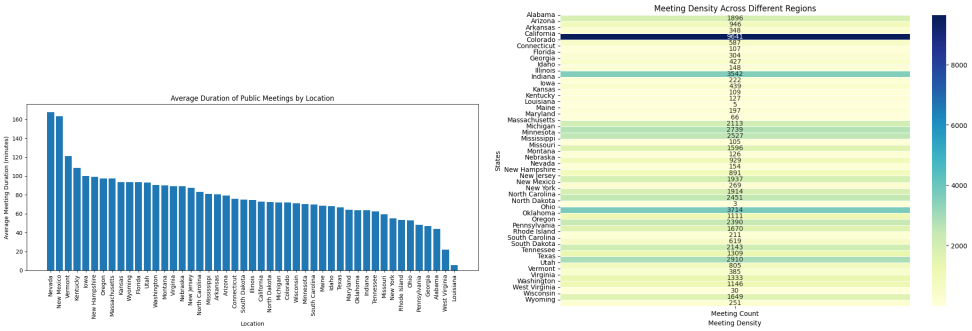
To amplify the intuitive comprehension of the subjects deliberated during meetings, we employ a word cloud visualization technique. This portrayal effectively accentuates the keywords recurrently cited, delivering a concise overview of prevailing topics. Through this visual approach, we can discern both the commonalities and disparities spanning multiple years. As depicted in 3, conventional governmental meeting terms such as "second" or "pause" are prominently displayed. Moreover, distinct variations emerge: in 3a, there exists a notable scarcity of references to fiscal matters, as opposed to the contrasting scenario in 3b. This analytical method enhances our understanding of thematic trends within government meetings, enabling more nuanced insights into the evolution of discourse and priorities.

(a) word-cloud 2009 (b) word-cloud 2013

Figure 3: word-clouds over the years

7 Meeting Duration by Location

A heatmap visualization has been crafted to portray the distribution of public meetings within different geographical zones. This cartographic depiction serves the purpose of discerning regions with heightened demand for civic involvement. As depicted in 4b, it is evident that the state of California boasts the lion's share of documented meetings, whereas the subsequent states record an approximate 62% decrease, amounting to around 3600 meetings. Furthermore in 4a a bar plot, highlights Nevada and New Mexico as frontrunners in terms of meeting duration, with sessions lasting around 160 minutes, while California lags behind at roughly 80 minutes. This spatial and temporal analysis offers valuable insights into government meetings data, aiding in informed decision-making and resource allocation.



(a) average meeting duration by state (b) heatmap of meeting density by states

Figure 4: Duration metrics

8 Exploring Engagement Metrics

Through an examination of engagement metrics encompassing parameters like view counts, likes, and comments, we glean valuable insights into public interest and participation dynamics. Employing correlation analysis, we unravel the interconnections between meeting duration and audience engagement.As depicted in Figure 5a, a compelling observation emerges: shorter videos tend to attract higher engagement in terms of likes and comments. Conversely, in the context of views, as demonstrated in Figure 5b, longer videos tend to secure heightened engagement. However, Figure 5c illuminates a more intricate narrative: the correlation between these facets of engagement metrics is not notably pronounced.

(a) average engagement metrics - likes and comments

(b) average engagement metrics - views

(c) correlation of meeting duration metrics

Figure 5: Engagement metrics

9 Related Work

In the realm of local government analysis, a plethora of research has explored the dynamics of government meetings through the analysis of transcripts. Notably, Smith and Johnson (2019) conducted a comprehensive literature review on citizen participation and local governance, discussing various models of engagement and the impact of public meetings on decision-making. Brown and Green (2020) provided linguistic insights into public meeting discourse, unveiling power dynamics and communication strategies. Zhang and Wang (2018) linked social media sentiment to citizen engagement, highlighting the role of online discussions. Davis and Stewart (2017) employed spatial analysis to assess meeting accessibility and inclusivity, revealing potential disparities in participation based on geographic factors. Lastly, Hernandez and Johnson (2016) explored the effectiveness of meeting streaming in engaging disengaged populations, leveraging technology to bridge gaps in civic involvement.

10 Conclusion

This study offers a comprehensive analysis of local government public meeting transcripts, revealing valuable insights for civic engagement dynamics. We examined meeting frequency trends, identifying California as a focal point, prompting further investigation into its underlying factors. Our analysis of meeting topics highlighted the intricate relationship between states' preferences and governmental subjects. Sentiment analysis indicated positive sentiment predominance, with opportunities for exploring sentiment fluctuations' influencers.

Furthermore, we explored the correlation between meeting duration and engagement metrics. Our findings showed shorter videos garner more likes and comments, while longer videos attract more views. The nuanced relationship between these metrics suggests the need for further research.

In addition to insights, the related work section contextualized our study within the broader landscape of local government analysis. Our work paves the way for future research, encompassing the impact of external factors on meeting dynamics and advanced natural language processing techniques.

In summary, this analysis deepens understanding of local government meetings, enhancing civic participation strategies. While concise, this study suggests avenues for further research, reflecting the dynamic nature of engagement processes.

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