DATA VISUALIZATION AND INTERPRETATION
DS 650

SOCIAL MEDIA TWEET ANALYSIS

PROJECT DELIVERABLE 4

Team Members
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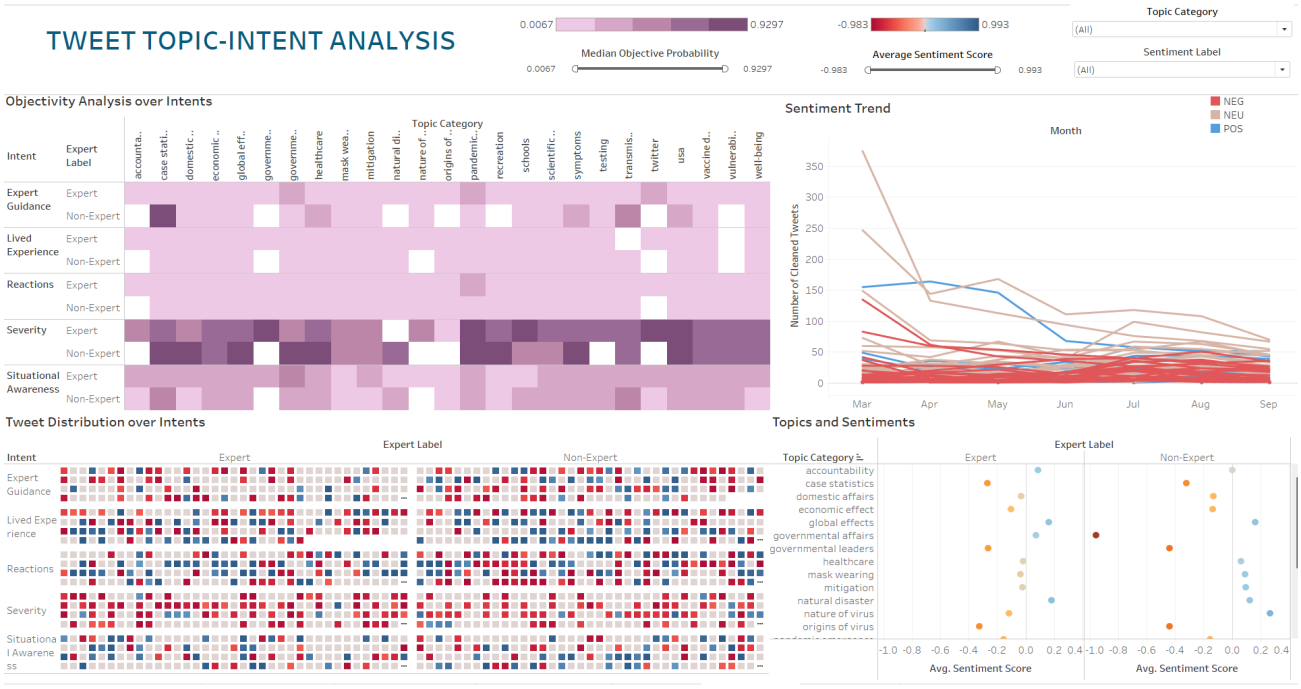
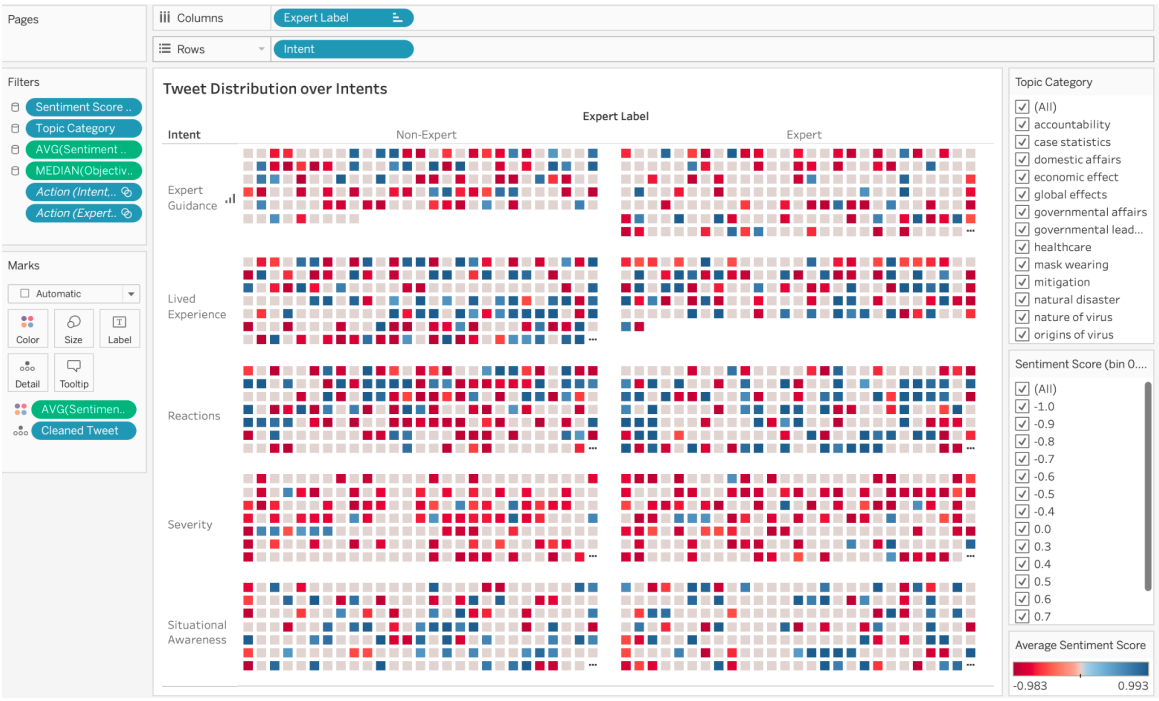
1. Purpose of the Dashboard:

In the context of analyzing COVID-19-related tweets, the dashboard serves the purpose of providing a comprehensive and interactive platform for gaining insights into tweet sentiments, intent variations, and objectivity trends over time. Different visualizations act as different sources of information and perspective, enabling us to draw various insightful conclusions. For instance, public health officials may use the dashboard to understand how sentiments and intents evolve during different phases of the pandemic, allowing them to tailor communication strategies and address emerging concerns. Additionally, correlations between objective tweets, their sentiments and intents can also be deduced, contributing towards measuring the credibility of the tweets, which can be used by public information broadcasters to rightly rule out and report non-factual information.

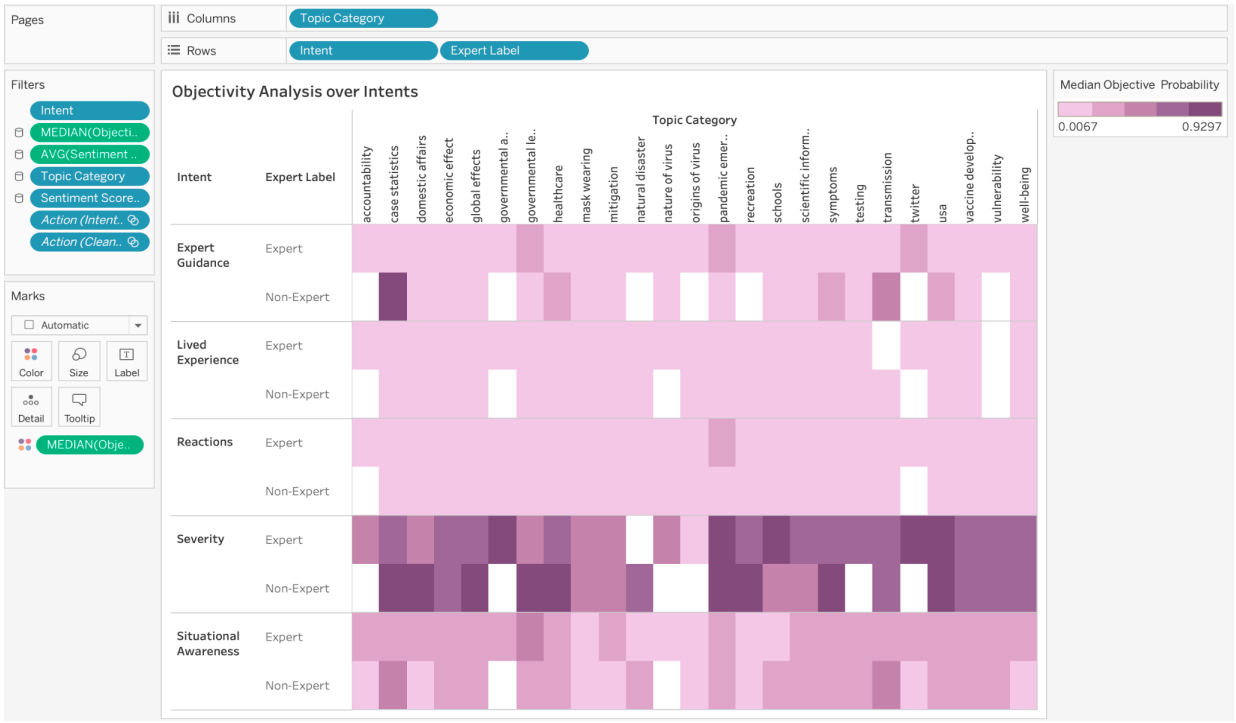


2. Modifications to Originally Identified Visualization Tasks:

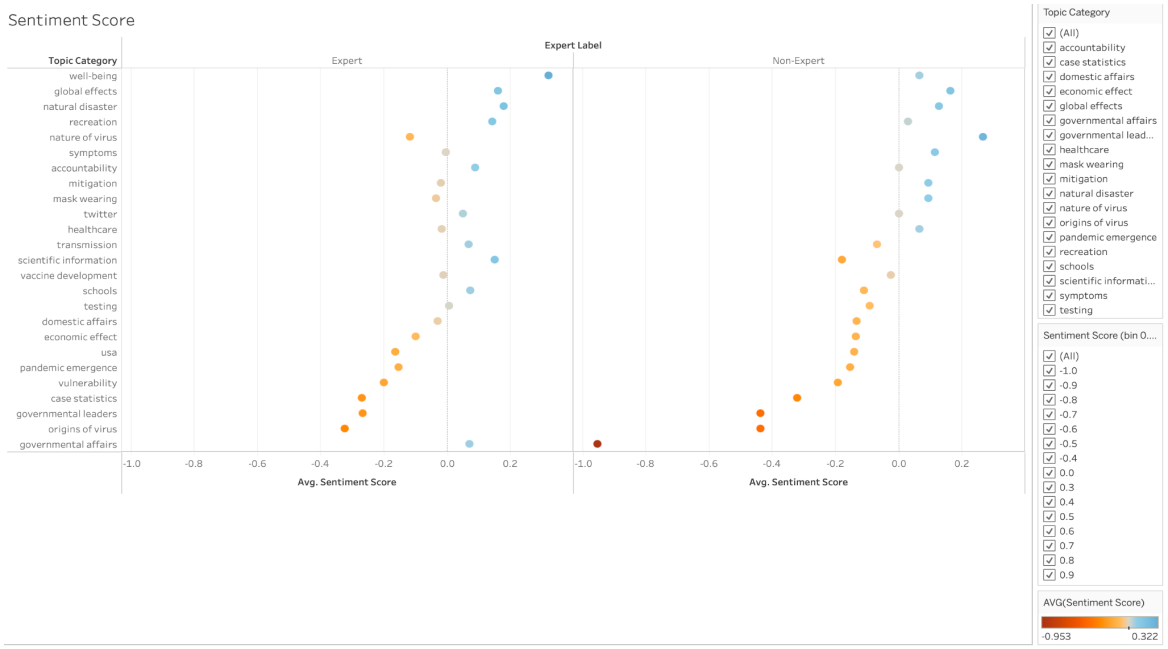
- <u>Dot Plot of Tweet Distribution Over Intents:</u> Initially designed to display sentiments across topic categories, it now enriches the comprehension of tweet distribution within each intent category. This refined visualization offers a detailed view, as it shows the tweet by tweet distribution over each intent category, complementing the broader trends presented in the aggregated line graph.



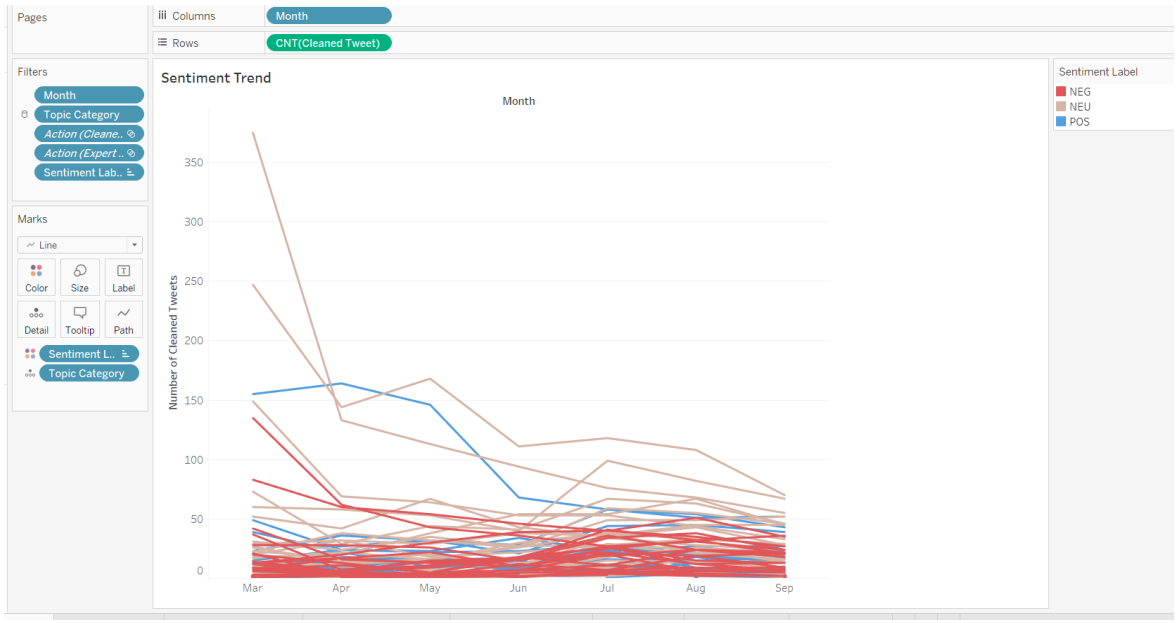
- Heat Map of Objectivity Analysis Over Intents: Offers a broader perspective on tweet objectivity in different intent categories, complementing the detailed time-based analysis provided by the line graph.



- Comparing Sentiments over Topics: The positioning of the circle within corresponds to the intersection of an expert label and a topic category. This visualization allows users a focused analysis on selected topics and sentiment score ranges.



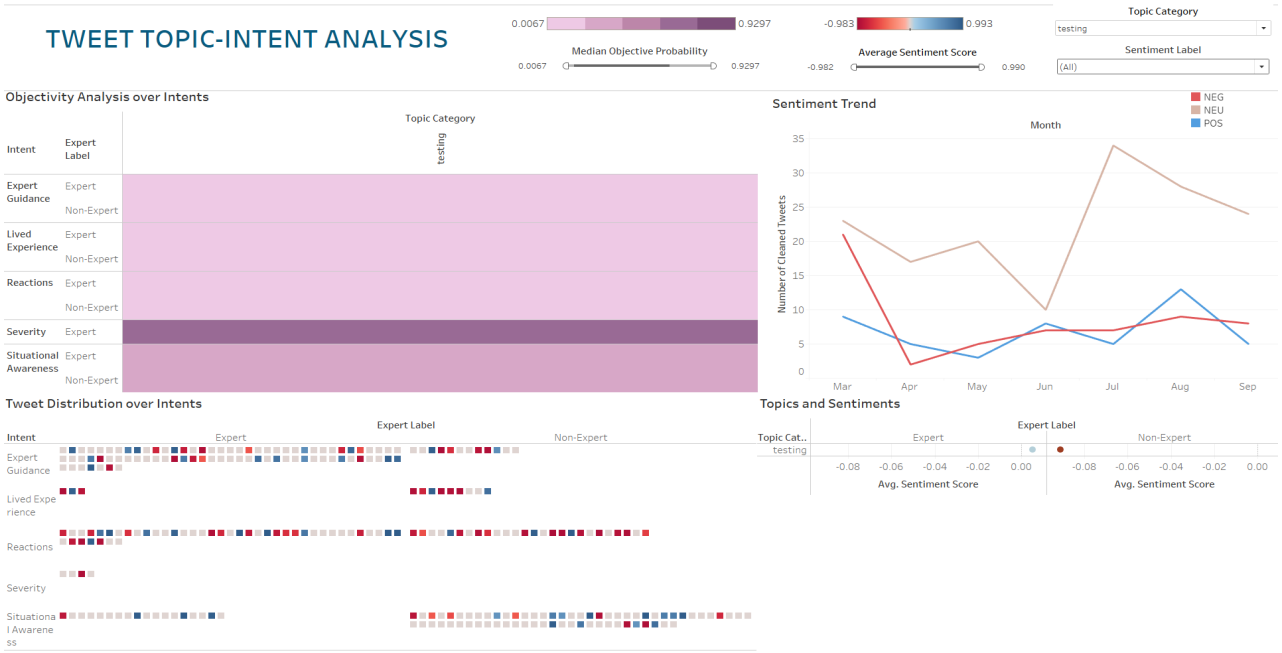
- Sentiment Label Trend: This visualization shows the trend of positive, negative and neutral tweets over the duration with respect to particular topics. We can see most tweets were neutral and the trend did go downhill and uphill but the count was still high compared to other sentiments.



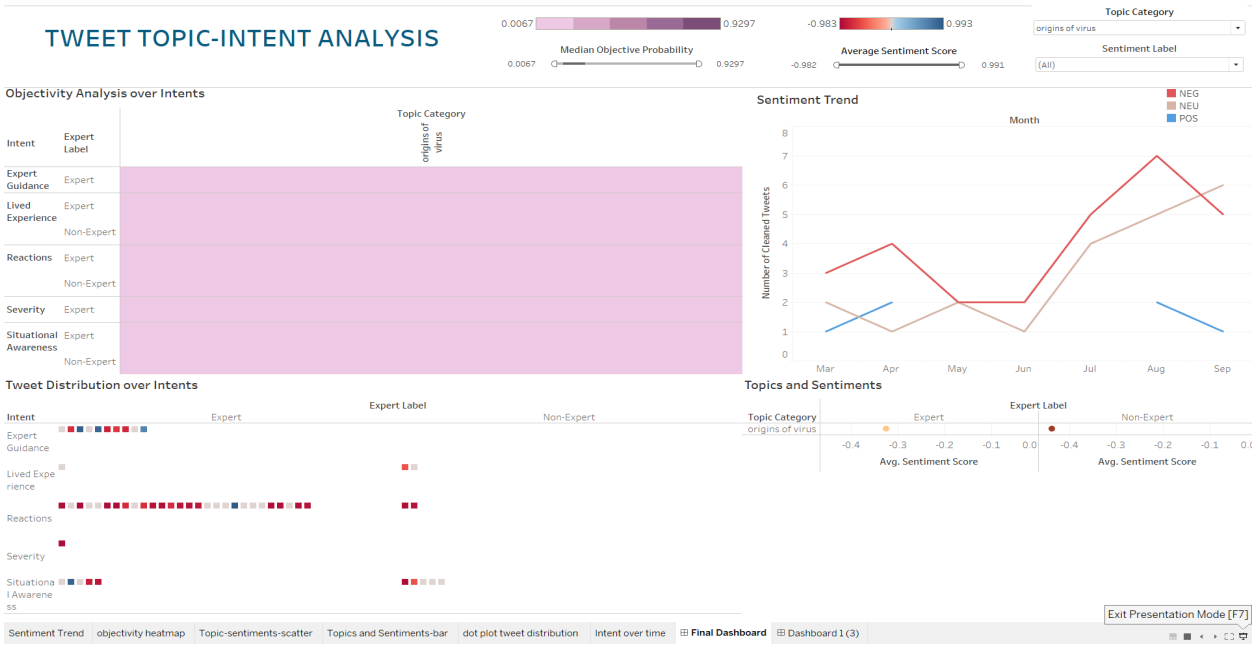
Note: The graph might look cluttered at first but when a particular topic is selected, the lines are simplified. Hence proving the use of dashboard

3. Inferences

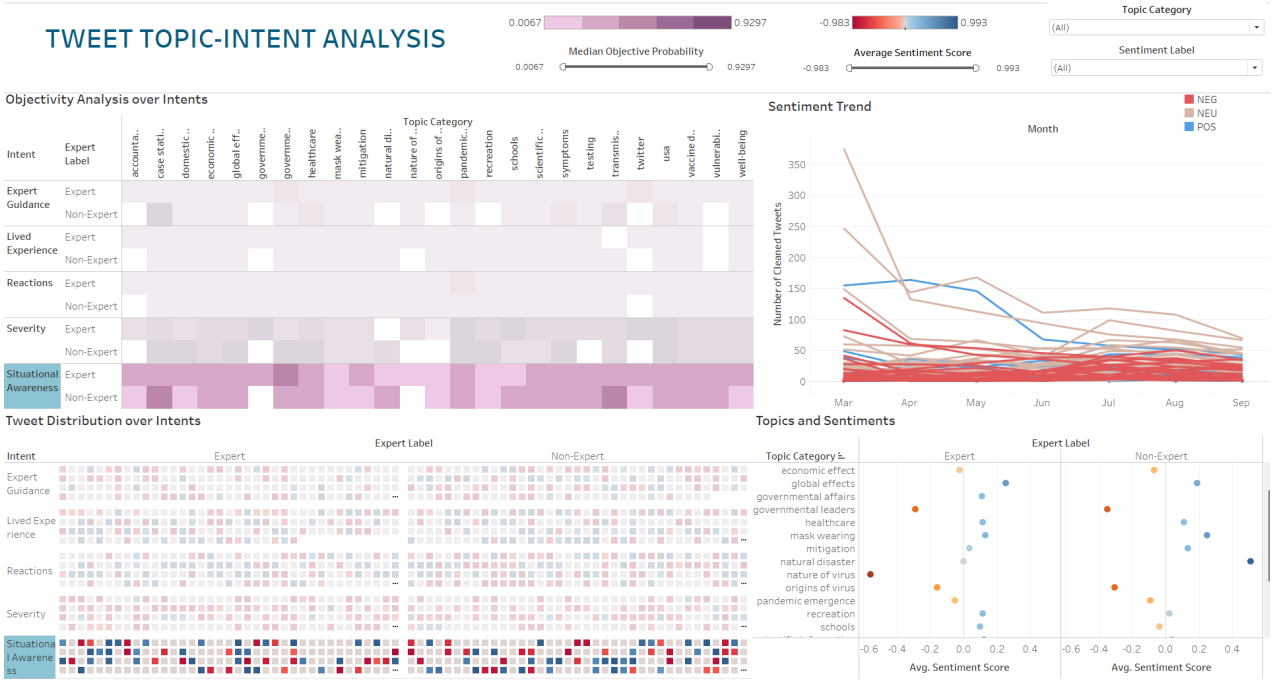
- Topic-wise Analysis: The topic categories which the tweets can belong to are diverse and hence, a hypothetical journalist may be interested in the sentiments associated with each topic category. He can select any topic category from the drop down filter above to view the results for only the selected category. He checks the results for different topic categories and analyzes them to see which topic categories need more attention and coverage. For example, here he has chosen the topic category ‘Testing’. The number of negative,positive and neutral tweets under each topic category can be seen.



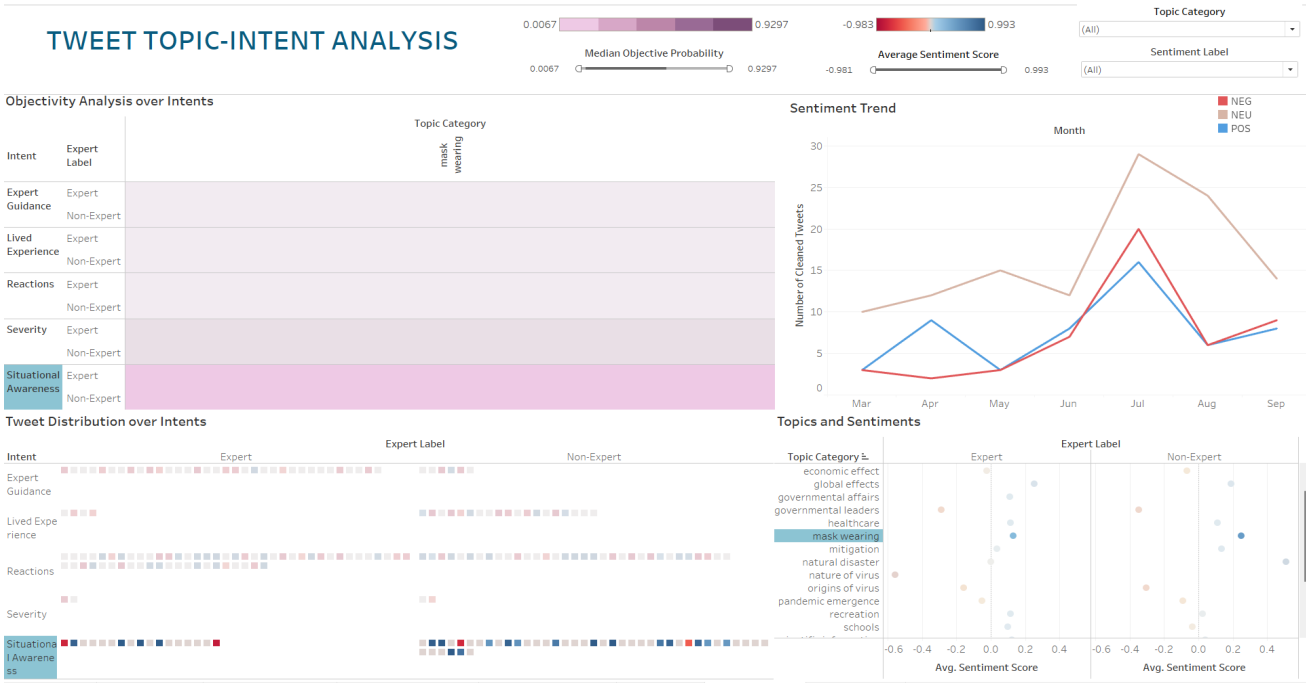
Further he views the topic category ‘Origins of Virus’ to check the results. He sees that tweets across this category are relatively very subjective when compared to the others (indicated by the lighter purple shades on the heatmap). He also notices that even if the number of tweets have increased as the time progressed (the lines climbing up on the sentiment trend plot), the overall number of tweets under this category are very less, hinting towards lesser discussion or probably lesser knowledge among the public. He thus infers to cover more news and provide more factual information about the ‘origin of virus’ in his upcoming articles and talks.



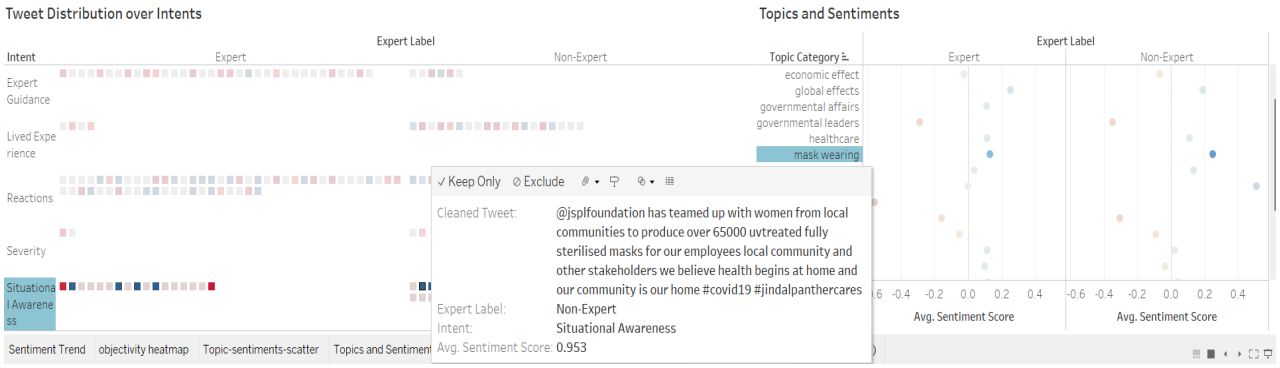
- <u>Intent-Topic Analysis:</u> A general user's intention mostly resonates with the intent categories provided and can focus more on an intent-level analysis as well. A hypothetical public safety official is concerned with the awareness of people regarding the pandemic and would like to assess the same. He selects the intent category 'Situational Awareness' by clicking on the same from the heatmap.



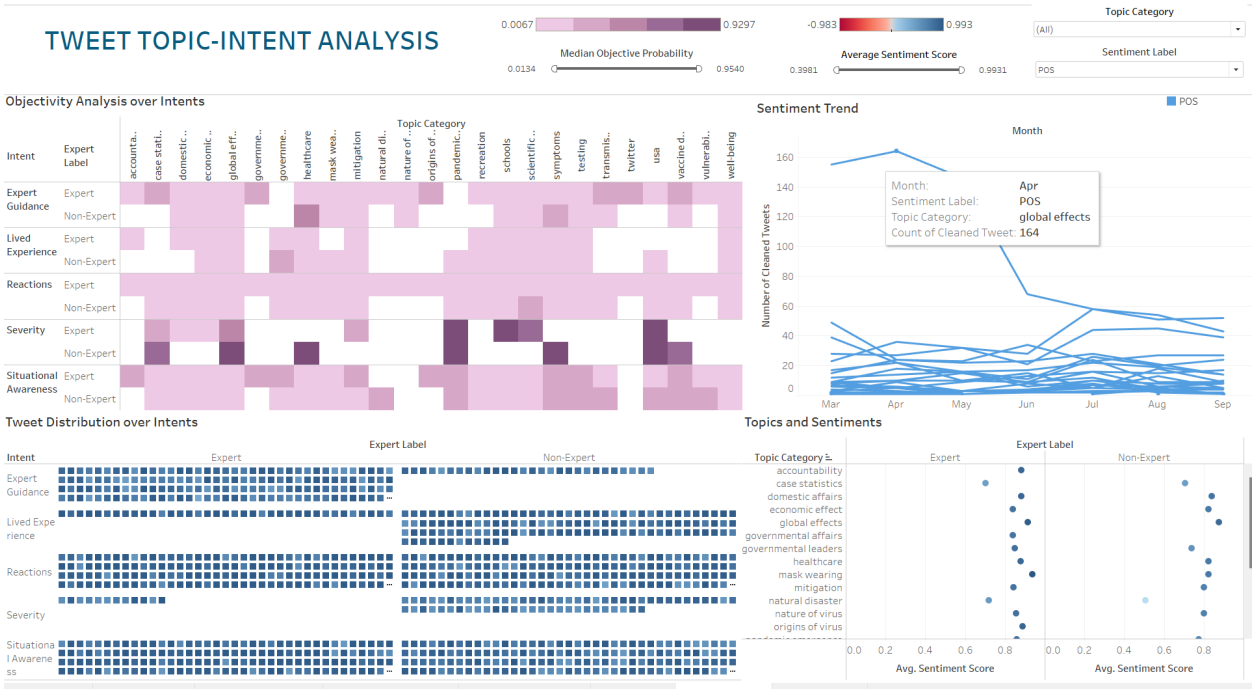
He scrolls through the chart for topics and sentiments to check which topic categories under this intent, has more negative and positive sentiments associated with. He sees the topic category ‘Mask Wearing’ with positive sentiments associated with it and decides to have a look at it and clicks on the topic title on that chart. He sees identical looking sentiment trend graphs over time and many positive tweets under tweet distribution as well (indicated by blue square dots). Even though the positive sentiment associated is a good sign, he notices that the tweets are more subjective in this area (indicated by light pink shade on the heatmap) and feels that the tweets are not really based on facts.



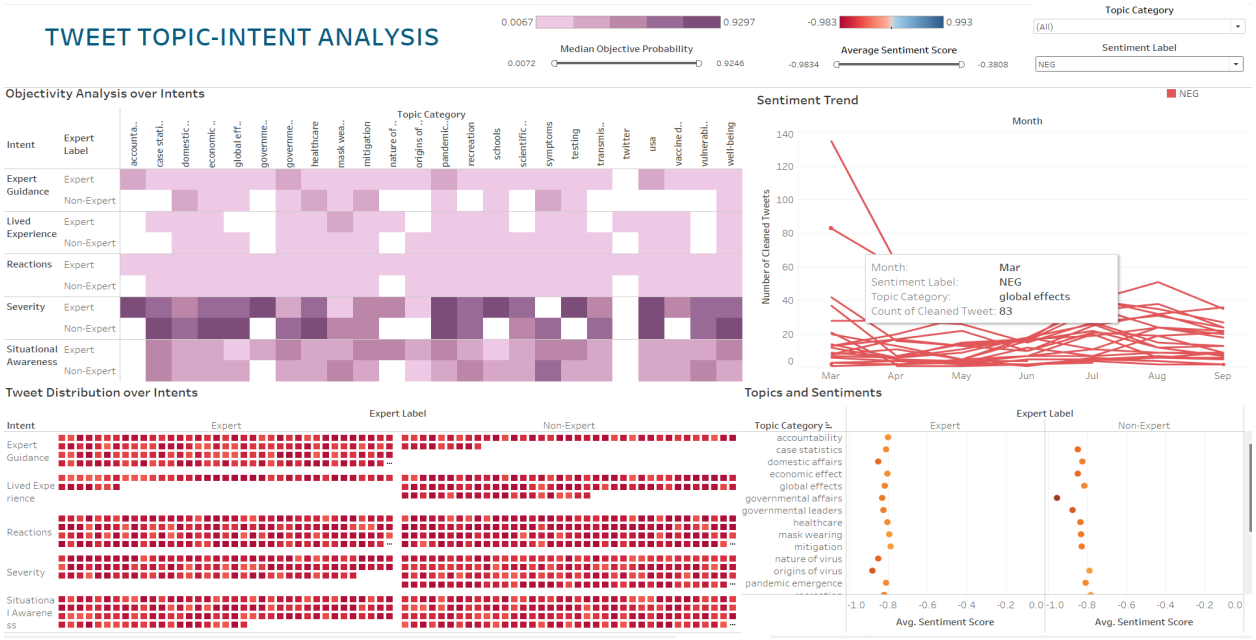
He checks some of the tweets and feels that the positive sentiments are loosely based on the donation of masks and free services.Thus, he infers to give more attention towards public awareness programs and decides to do a regular fact-check on information broadcasted.



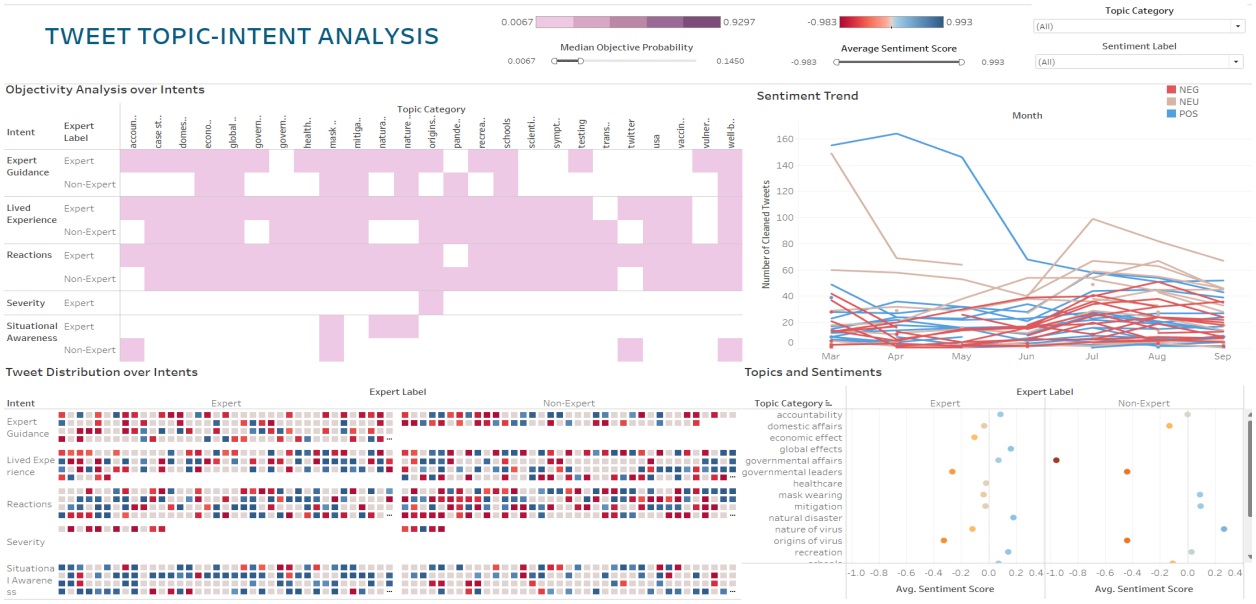
- <u>Focusing on Sentiments Related:</u> When it comes to working for the public, it is important to be aware of their sentiments and opinions. A hypothetical public official who holds the position of designing government policies is interested to look at each sentiment label and analyze where it is coming from. He selects ‘POS’ or positive from the sentiment label dropdown and views the results where he notices a line falling (on the sentiment trend plot) as the time goes. He hovers over the line to see the topic category as ‘Global Effects’.



He changes the selection to ‘NEG’ negative tweets and views the negative sentiment analysis to check the topic category ‘Global Effects’ again. He can infer that his team has to dig deeper into the problem so that he can provide mitigative measures to treat the negative global impacts of the pandemic while not hampering the positive ones.

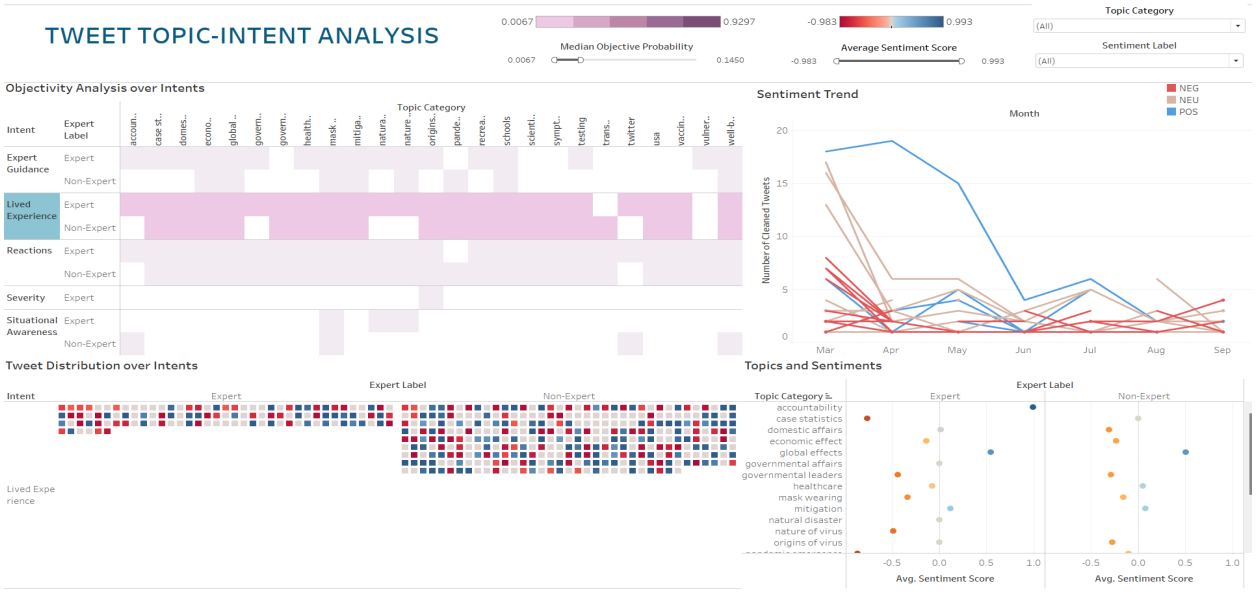


- Subjectivity and Sentiments: Gathering more data and various experiences are significant in order to keep track of the pandemic behavior. A hypothetical public health official drags the bar of Median Objective Probability to the left in order to look at subjective tweets and finds ‘Lived Experience’ as one of the most subjective intent categories (indicated by light pink shade on heatmap).



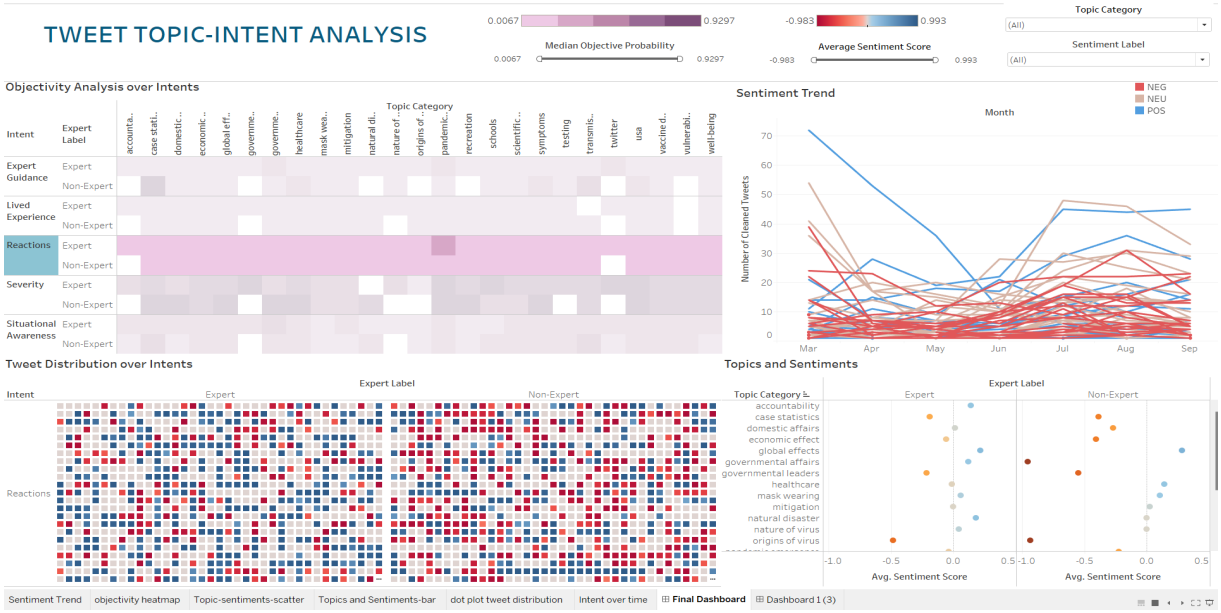
As a person who sees the COVID cases closely, he is concerned to analyze the experiences of the general public and looks at the intent category ‘Lived Experience’, and clicks on it from the heatmap. He sees many positive tweets associated with it (indicated

by blue square dots on the tweet distribution) and the count of decreasing negative tweets in general as well (on the line chart).

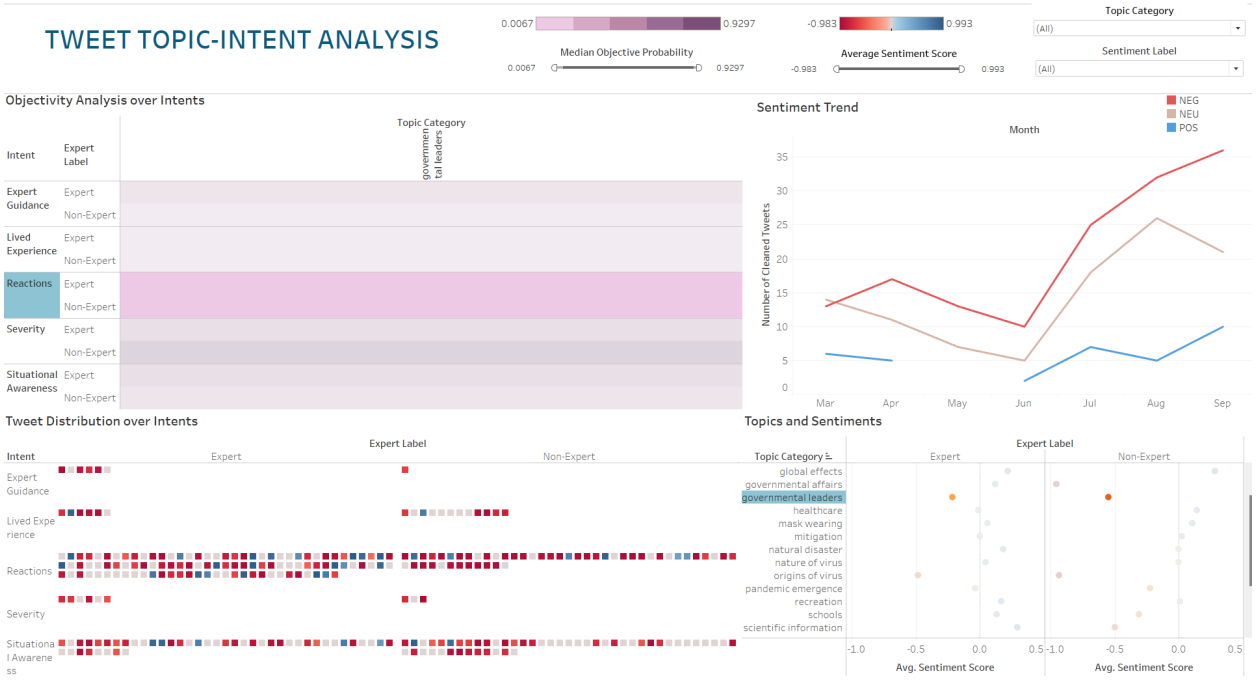


He infers that the more subjective tweets are of intent ‘Lived Experience’ as those will be mostly based on emotions and not on facts. Yet, he concludes that even though there are areas to focus on, the higher number of positive or neutral tweets hints at the measures taken gaining success as well.

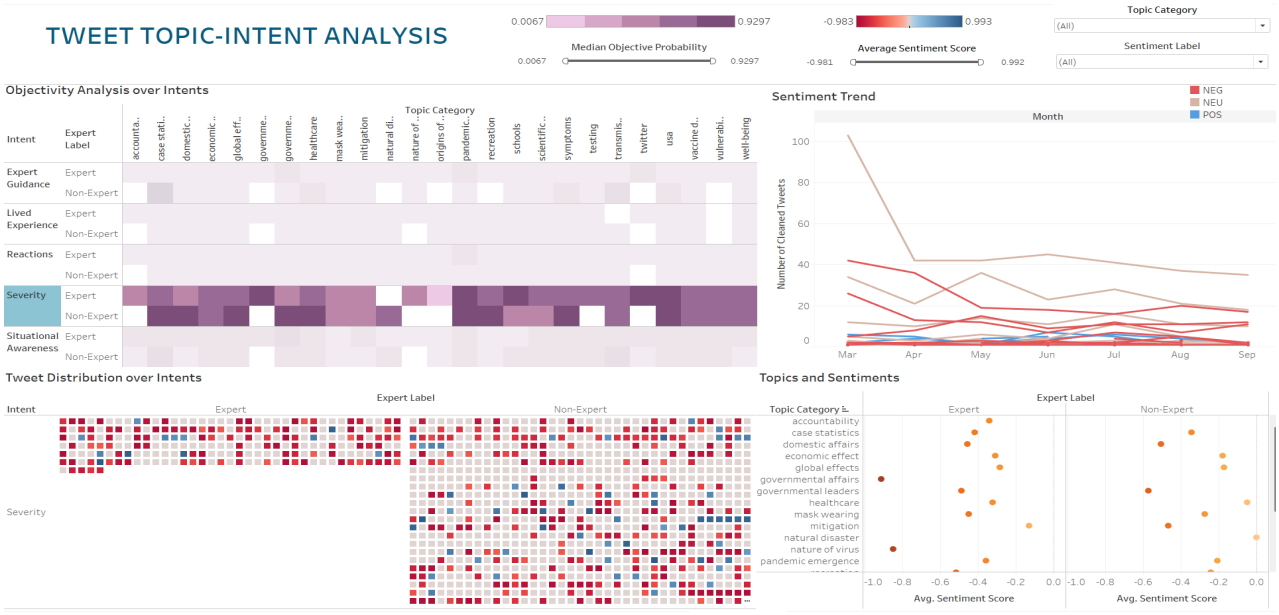
- <u>Analyzing public reactions:</u> A hypothetical government policy maker is interested to see the public reactions and sentiments associated. He selects the intent category ‘Reactions’ and notices a larger number of positive sentiments associated with it.



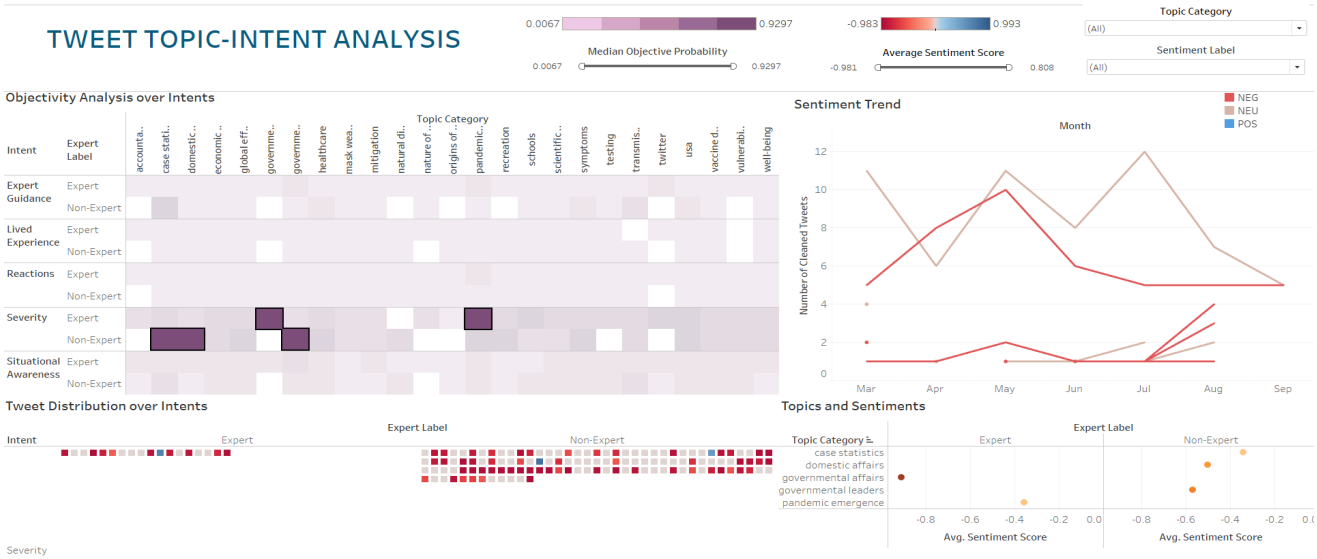
He looks at specific topic categories via the ‘Topic and Sentiments’ chart to look at the individual average sentiment scores of every topic category. He notices the topic category ‘Governmental Leaders’ marked with red dots hinting at negative sentiments. He clicks on the topic category title on the same chart to view the details. He sees that the negative sentiments have gone up as the time span and there are many negative sentimental tweets associated with it. He notices that even if the general reactions are positive, as he delves deeper into the concerned topic categories, the tweets on intent ‘reactions’ are more negative towards the government leaders. As a responsible leader, he can look into the reasons behind this and focus more on the concerned topic categories for the betterment of the public.



- <u>Correlating Tweet Objectivity and Sentiment:</u> The objectivity of a social media tweet refers to the degree to which the content of the tweet is impartial, unbiased, and free from personal opinions or emotions. Here, the objectivity and tweet distribution work together to provide clearer insights. A hypothetical public official is interested to see if objective tweets and sentiments are correlated. He can see darker colors on the heatmap associated with the intent category ‘Severity’ and clicks on the intent. He sees the larger number of negative tweets on the tweet distribution (red dots) and more negative lines (red lines) on the sentiment trend over the time span.



He sees that the intent category ‘Severity’ is generally objective and there are notable spikes in objectivity (indicated by dark colors on the heat map). He selects those spikes specifically to dig out further and see that the majority of the tweets for that intent category lean towards negative average sentiment score. He can infer that the more objective tweets are more likely to carry negative sentiments. Additionally, he can also combine this information with expert labeled tweets to take one more step ahead towards mining the factors contributing to the credibility of a tweet



4. Contribution Statements

Manan: I worked on drafting the document and brainstorming ideas and inferences for this deliverable. I designed visualizations for sentiment trends and contributed in combining all our works to build this dashboard. I also actively participated in discussions, presentations and demos. I also worked on wordnet using python and tableau, but didn't apply it, as it was not adding the expected value towards the project goals. Lastly I contributed towards the development of this final deliverable of dashboard.

Megha Manoj: I worked on the objectivity analysis heatmap and designed the final dashboard by positioning and placing our designs and filters. I also focused on the proper interactions between the visualizations on our dashboard in order to ensure usability. I also actively brainstormed and contributed into the presentation, demo as well as in the creation of this final document and dashboard.

Mehnaz Siddiquee: I contributed by sharing ideas during brainstorming and assisting with the dashboard design. I developed visualizations for sentiment - topic analysis and participated in merging everything to build the final dashboard. While I played a role in focusing on the dashboard's aesthetics and usability, it's crucial to acknowledge the collective effort of the entire team. I believe our project turned out well because of everyone's combined dedication and hard work.

Richa Mishra: I actively contributed to deriving meaningful insights for the dashboard in collaboration with the team. I focused on incorporating topic categories in our dashboard and actively put effort in the interplay of the visualizations. I played a role in the brainstorming sessions to identify key inferences and determine the most relevant visualizations tailored to our project's objectives and overall dashboard functionality.