COVID-19 & People's Sentiments in 🇨🇳 🇸🇬

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Business Problem

We are investigating the following four dimensions of people's perceptions surrounding the COVID-19 outbreak in China and Singapore

- Groups of people who are concerned (who care)
- Reasons of concerns (why people care)
- Discussion topics about COVID-19 (what are people talking about)
- Discussion topics with a timeline (when people are concerned).

Business Client

China Cultural Center (CCC) is an official cultural institution overseas which is established by the chinese government. CCC Singapore aims to introduce Chinese culture to Singapore, and to enhance the understanding and friendship between the two peoples.
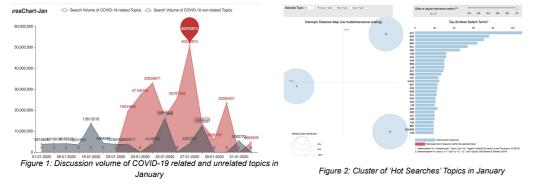
What we can offer

- Enhance the mutual understanding between the masses in China & Singapore
- Understand the evolution of public stress from China's experience

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Chinese Context

Degree and Topic of concern over time

Figure 1: Discussion volume of COVID-19 related and unrelated topics in January

Figure 2: Cluster of 'Hot Searches' Topics in January

In this section, we use 3 kinds of analysis to analyse and verify the concerns of COVID-19 from 01 January to 27 March. An area chart is used to visualize the discussion volume of COVID-19 related and unrelated topics over time. From the area chart, we can easily find the tipping point in each month and the trend of degree of concern over time. To verify the trend shown in the area chart with a larger dataset, we further conducted the unsupervised learning to carry out a topic modelling analysis among the 'Hot Searches' dataset, trying to find out what are the clusters of topics that people are discussing. From the clusters shown in the topic models, we can easily verify the trend of concerns in each month. In addition, with the raw dataset of "Hot Searches", we created a word cloud for each month and observed that the public's discussion topics changed significantly over these three months.
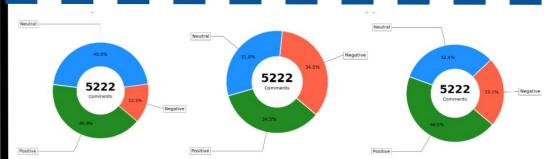

Figure 3: Word Cloud of hot searches data for January

Sentiments (%) & Clusters of opinions on incidents

Figure 4: Example of percentage of positive and negative sentiments in Singapore-Hangzhou-Flight incident

Figure 5: Example of topic modelling in Singapore-Hangzhou-Flight incident

In order to gain some further insights into people's perspectives on certain incidents other than positive and negative sentiments, we carried out a topic modelling for the 18 selected incidents in Economical, Political, Social area to find out which are the cluster of opinions on each incident. Based on the result of the clusters and our information of each incident, we were able to summarize each cluster's main emotion and opinion which is valuable to better understand the public's concerns. Figure 4 & Figure 5 depicts a sample analysis of "Singapore-Hangzhou-Flight incident". The summarization of the 3 clusters' opinions according to the keywords listed in each cluster:

Opinion 1: The responsibility of this incident lies with Wuhan residents who go abroad
Opinion 2: Singapore repatriates Wuhan travelers who have a fever to Zhejiang Province together with Zhejiang residents without informing them
Opinion 3: Caring about the medical staff who took over this flight and efforts made so far

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English Context

Figure 6: Word cloud from posts dated between 12 February 2020 and 29 February 2020.

Through the word maps, we noticed a shift in what people were talking about in relation to COVID-19. At first people seemed to be focused on the virus itself, its "symptoms", and buying "masks" to protect themselves. People then began to talk about the worsening "situation", "flight" cancellations, "new cases", "outbreaks", and "clusters". As time went on, words like "lockdown", "social distancing" and references to the "TraceTogether app" appeared. Throughout, the word "government" consistently appears, suggesting that the Singapore government plays a strong role in shaping societal perceptions and policies toward the COVID-19.

Figure 7: Sentiments over time: 12-29 Feb 2020, 1 -15 March 2020, 16-28 March 2020 (left to right)

From the above sentiment charts, in February, the majority of Singaporeans appeared to be neutral, with many on the positive side. Come March, and suddenly there is a sharp increase in negative sentiments and a simultaneous decline in neutral as well as positive sentiments, showing that the COVID-19 situation is starting to have an adverse impact on everybody's daily lives. However, as time goes on, positive sentiments slowly begin to rise again, indicating the nation rallying together to fight the spread of COVID-19.

Figure 8: Topic model from 12 - 29 February 2020 dataset

Over time, the topics evolved, with focus on the number of outbreaks, to flight cancellations and problems with refunds from airlines. Most recently, topics seemed to shift to minimizing contact, contact tracing, the TraceTogether app implemented by the Singapore government, and references to current economic and political events such as the Budget 2020 and the upcoming General Election.

Sentiments Trends

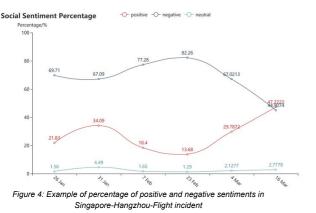Figure 4: Example of percentage of positive and negative sentiments in Singapore-Hangzhou-Flight incident

We generated graphs of sentiment trends based on the sentiment percentage of all the incidents.
By observing the line charts, we believe that the public has regained confidence and encouragement to recover from the pain of COVID-19 because of the government's actions as well as doctors' and nurses' dedication.

Tools/Technologies Used

GENSIM topic modelling for humans
Natural Language Analysis with Python NLTK
Python
pyLDAvis
Jieba
Baidu 百度 | NLP
BeautifulSoup
pyecharts

Conclusion

By analysing and comparing the sentiments and topics discussed toward COVID-19 over the past three months, there is a difference in the social media posts and comments of Chinese and Sinagaporeans. However, the similarity is that COVID-19 does bring the public a certain degree of negative sentiments, such as anger, anxiety and sadness. Through our analysis of China's experience, we can learn that the pandemic is controllable. The public in Singapore should thus remain calm and not be affected by temporary but amplified negative emotions.

IS434 Social Analytics & Applications project