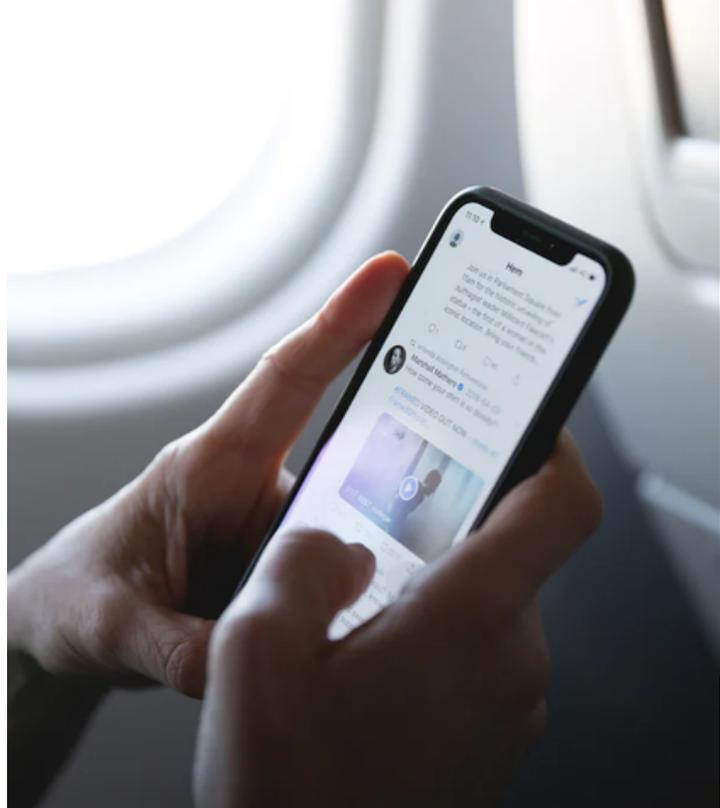


# A REAL-TIME VIEW ON CITIZEN'S SENTIMENT

A centralized, queryable API service and data archive of public opinion towards monetary policies across 100+ social media channels



## AT A GLANCE

### Challenges

- Huge number of Bank Indonesia's associated social media accounts (100+) with new data streaming in hourly (eg. facebook comments)
- Silo-ed data making it difficult to correlate reactions from one social network to another

### Benefits

- A centralized tracking infrastructure with a robust query-able API interface reducing the number of overhead work required for an analyst from 6 hours to 15 seconds (99.93% reduction)
- Minimizing costly and time-consuming manual work in manually analyzing 100+ social media accounts and channels to 'mine' for insights on public sentiment, which represent a savings of \$150,000 / annual

## CHALLENGES

As the central bank of Indonesia, Bank Indonesia (BI) oversee and uphold the stability of the financial condition in the country. To accomplish that, BI evaluates its policy-making and regulatory decisions against the general public's attitude towards it. One means of achieving that is through social media. However, gleaning insights from various social media sites are both **difficult** and **time-consuming**, particularly since there are 100+ pages, sites, and associated channels to pull these data from.

## SOLUTIONS

- Supertype built an **automated pipeline to scrape all** social media data (Facebook, Instagram, Twitter, YouTube) that are on Bank Indonesia's monitoring list, before **cleaning, validating and storing the output** on a private cloud storage (ETL).
- In parallel, Supertype develop a **token-based, authenticated API service** to enable BI's team to **query, build upon, and analyze** the data stored in the cloud storage for further analysis (e.g temporal, textual, engagement, sentiment analysis etc.) in a way that is secured, language-agnostic, and highly independent
- Supertype also developed a Next-based web application so any users can use a beautiful interface to filter and query for data:
  - **Topic & category extraction** of each post.
  - Regression analysis to identify **key factors that affect public's opinion**, both in the positive and negative direction
  - **Sentiment analysis of each comment** to quantify a public reaction towards a certain regulatory detail or policy announcement

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## SOLUTIONS

- In addition to the API interface and web app interface, Supertype's data scientist employ a sentiment scoring model that is robust to English and Indonesian ("Bahasa Indonesia") language to account for the multi-lingual comments on social media sites
- An admin portal was also developed so Bank Indonesia can easily moderate access to its data storage, provision new accounts for its web app, and implement administrative duties and permissions from a user-friendly interface
- An interactive API documentation portal that synchronizes with the data model was also created and presented to help foster a culture of 'citizen data scientists', where non-programmers can develop analysis without too much difficulty
- Numerous consulting sessions and calls were carried out throughout the consulting period, culminating in a hands-on knowledge sharing session where Bank Indonesia gets to query the API following an in-person workshop

## Key Benefits

### Minimize manual work

The ETL pipeline automatically retrieves internet comments from social media channels of BI's monitoring list and loads them into the centralized database periodically following a well-defined schematic process, saving an estimated 500 man-hours and \$12,500 every month (~\$150,000/year).

### A uniform archive of public opinion data

Having a persistent single source of truth that combines data from 100+ disparate sources periodically create a valuable archive of query-able data for BI's internal team of data scientists, social scientists and analysts

### Comprehensive knowledge of public's reaction

The analysis of the social media data helps BI to better understand how public perceives monetary policies and relevant regulatory measures, and in turn, be more informed in its public communications effort and social campaigns



Supertype has proven to be more than capable in translating our needs and expectations. Through their work we were able to visualize the social media analytics and citizen's sentiment. Additionally, Supertype ensures a smooth knowledge transfer process to our team (Bank Indonesia)

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