
COVID-19 Financial Statement Disclosures

Natural Language Processing

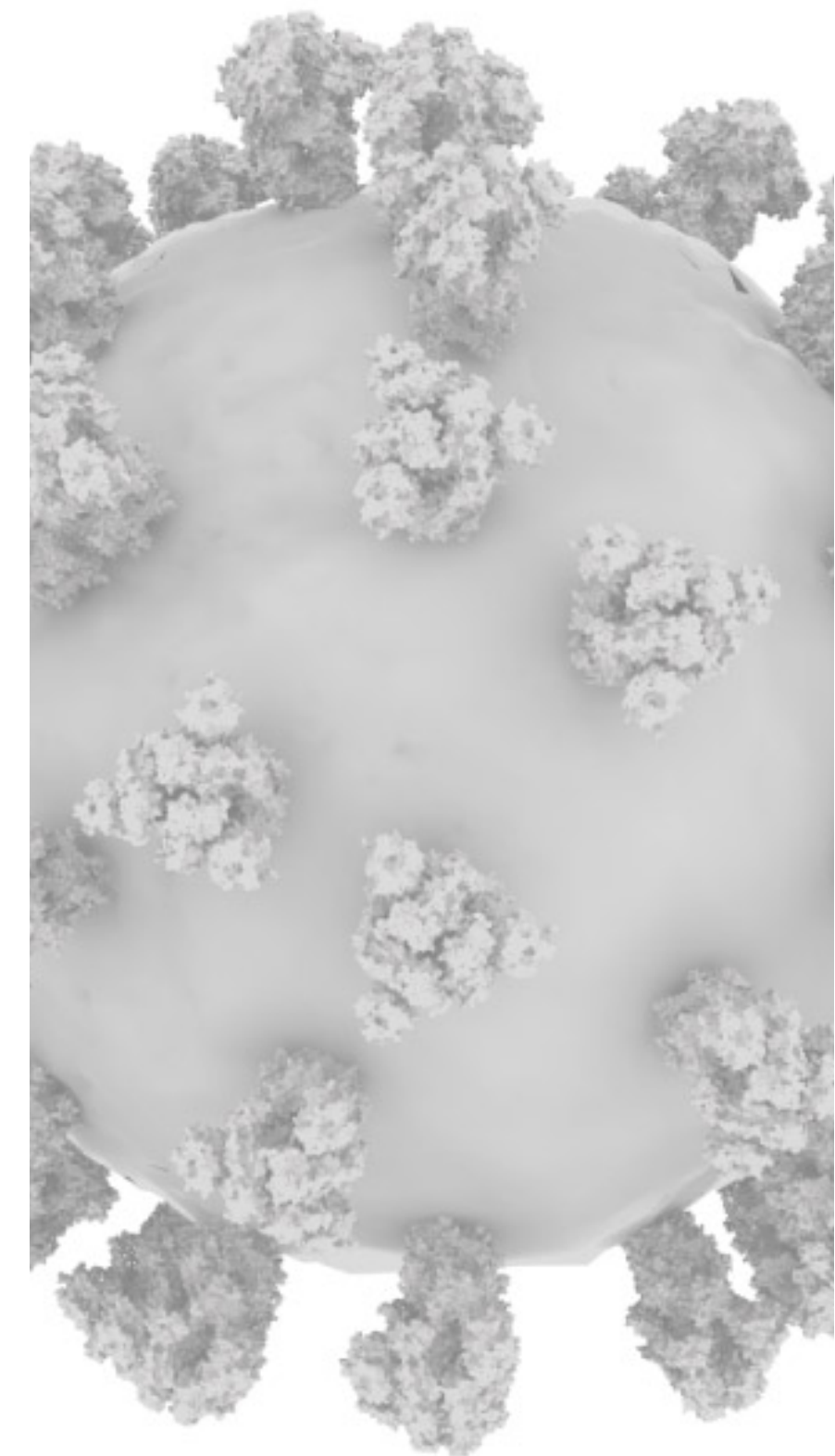
Jason Dunleavy, Data Scientist



Background

Background

- Q1 2020: COVID-19
- Business implications
- Accounting implications
- Additional required disclosures
- SEC CF Disclosure Guidance: Topic No. 9A



Motivation

Table of Contents

**UNITED STATES
SECURITIES AND EXCHANGE COMMISSION**
Washington, D.C. 20549

FORM 10-K

**ANNUAL REPORT PURSUANT TO SECTION 13 OR 15(d) OF THE
SECURITIES EXCHANGE ACT OF 1934
For the fiscal year ended December 31, 2020**

Commission file number 1-3285

3M COMPANY

State of Incorporation: **Delaware**

Principal executive offices: 3M Center, St. Paul, Minnesota 55144
Telephone number: (651) 733-1110

I.R.S. Employer Identification No. **41-0417775**

Securities registered pursuant to Section 12(b) of the Act:

Title of each class	Trading Symbol(s)	Name of each exchange on which registered
Common Stock, Par Value \$.01 Per Share	MMM	New York Stock Exchange, Inc.
	MMM	Chicago Stock Exchange, Inc.
0.375% Notes due 2022	MMM22A	New York Stock Exchange, Inc.
0.950% Notes due 2023	MMM23	New York Stock Exchange, Inc.
1.500% Notes due 2026	MMM26	New York Stock Exchange, Inc.
1.750% Notes due 2030	MMM30	New York Stock Exchange, Inc.
1.500% Notes due 2031	MMM31	New York Stock Exchange, Inc.

Note: The common stock of the registrant is also traded on the SWX Swiss Exchange.
Securities registered pursuant to section 12(g) of the Act: **None**

Indicate by check mark if the registrant is a well-known seasoned issuer, as defined in Rule 405 of the Securities Act. Yes ☒ No ☐

Indicate by check mark if the registrant is not required to file reports pursuant to Section 13 or Section 15(d) of the Act. Yes ☐ No ☒

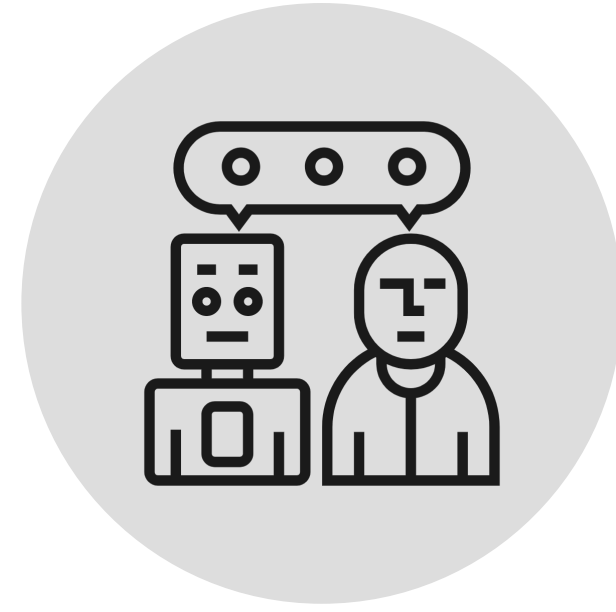
Indicate by check mark whether the registrant (1) has filed all reports required to be filed by Section 13 or 15(d) of the Securities Exchange Act of 1934 during the preceding 12 months (or for such shorter period that the registrant was required to file such reports), and (2) has been subject to such filing requirements for the past 90 days. Yes ☒ No ☐

Indicate by **check** mark whether the registrant has submitted electronically every Interactive Data File required to be submitted pursuant to Rule 405 of Regulation S-T (§ 232.405 of this chapter) during the preceding 12 months (or for such shorter period that the registrant was required to submit such files). Yes ☒ No ☐

Indicate by check mark whether the registrant is a large accelerated filer, an accelerated filer, a non-accelerated filer, a smaller reporting company, or an emerging growth company. See the definitions of “large accelerated filer,” “accelerated filer,” “smaller reporting company,” and “emerging growth company” in Rule 12b-2 of the Exchange Act.

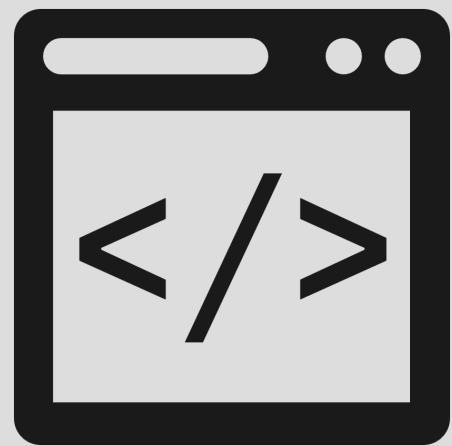
☒ Large accelerated filer
 ☐ Accelerated filer
 ☐ Non-accelerated filer
 ☐ Smaller reporting company
 ☐ Emerging growth company

If an emerging growth company, indicate by check mark if the registrant has elected not to use the extended transition period for complying with any new or revised financial accounting standards provided pursuant to Section 13(a) of the Exchange Act. ☐



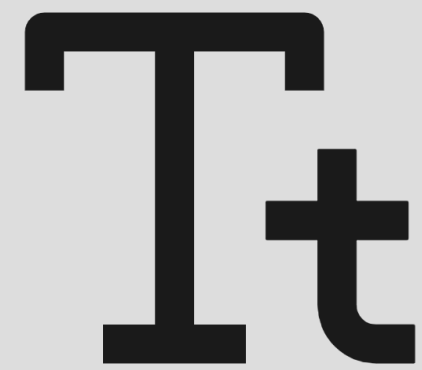
Methodologies

Pipeline



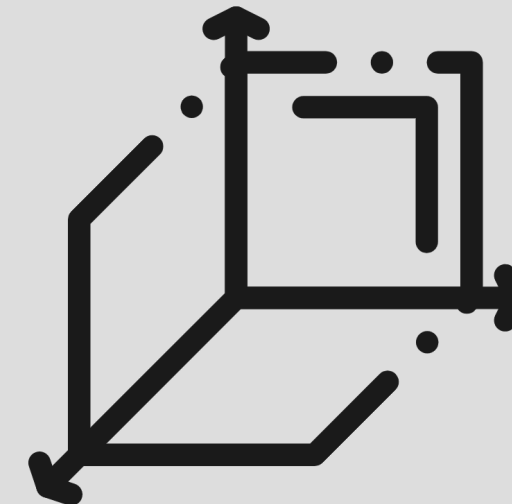
Web Scraping

- SEC API
- BeautifulSoup



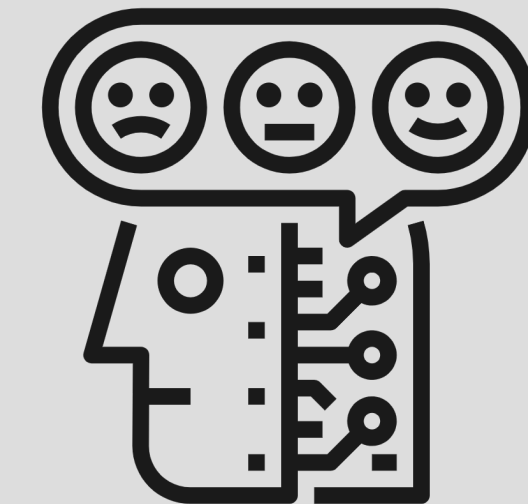
Text Preprocessing

- Stop words
- Bigrams/Trigrams
- Number removal
- TF-IDF



Topic Modeling

- NMF
- LDA

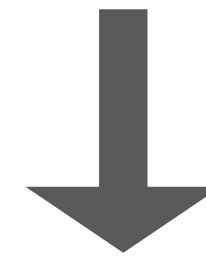


Sentiment Analysis

- VADER



Findings



DASHBOARD

https://public.tableau.com/profile/jason.dunleavy#!/vizhome/covid_disclosures/COVID-19FinancialStatementDisclosures?publish=yes



Future Work

Future Work

- Train sentiment classifier on financial statement text
- Continue collecting data through end of pandemic
- Analyze financial news data
- Feed output of model into a classification problem

Q & A



Thank You



Appendix

Data Sources

S&P 500 Listing:

- <https://datahub.io/core/s-and-p-500-companies>

Ticker to CIK Mapping:

- <https://www.sec.gov/include/ticker.txt>

SEC API:

- <https://sec-api.io/>

Financial Statement Filings (various):

- <https://www.sec.gov/edgar/searchedgar/companysearch.html>

Tools & Packages



NumPy



BeautifulSoup