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Text Analytics and Natural Language Processing(NLP)

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As a public company or company whose ownership is organized by shares of stock and shareholders have a claim to part of the company's assets and profits, each company has to provide an earning call and earning report that contains summary information on financial performance for the period(FINRA.org). Most of the companies provide the earning report every 3 months or on a quarterly basis. Each company provides the earning call and earning report in multiple forms(unstructured data) such as audio media, visual presentation, and financial reports. The earning report will discuss in detail the performance metrics including aspects of growth or decline, balance sheet, financial statement, upcoming innovations, future developments, and any changes in the management roles. The majority of companies issue a live earning call report and partner with journalists, analysts, investment banks, and finance firms. This live Q&A session is intended to explain in great detail the changes and expectations for the coming year. I believe the text analytics algorithms could help the company visualize its goals and helped the investors to perceive the firms from an analytics point of view.

Based on the information from World Bank, in 2018, there are around 4397 publicly listed companies in the United States, and it is projected to grow year over year(worldbank.org). The majority of regular investors have very little chance to listen and look at the earnings report closely because the length of the total call is extremely long. On average, a company would spend around 60 minutes of earning calls including the Q&A session each quarter.

For the majority of companies, the beginning of the year starts with quarter 4 (Q4) report earning and to summarize the overall performance for the year. I have selected the companies in technology and software-based with the highest Market Cap. Market cap is the total value of a company's outstanding shares of stock, which include publicly traded shares plus restricted shares held by company officers and insiders (Kiernan, 2018). I have selected Apple, Amazon, Google, and Facebook based on their similar focus on software and technology.

One example from Apple earnings call of Q1 2021, there are some key topics that were used throughout the report earning, such as the word services and iPhone. The word services came up 46 times and it is clear that Apple is pushing the new type of subscription that includes the Apple One Bundle. "The deep integration between apple ecosystem; hardware, software, and services, has always defined the approach for the company in the next year" , says Luca Maestri, the Chief Financial Officer. The word iPhone appears for 36 times during the earnings call. It is another key finding regarding Apple's plan for the upcoming year, which to improve the sales and revenue from iPhone. On the other hand, three unexpected words were found during the tokenization process; HIV, AIDS, and Zambia. During this call, Tim Cook said. "We've adapted our 14-year \$250 million effort to support HIV and AIDS work globally to ensure that care continues even in the time of COVID. That includes delivering millions of units of personal protective equipment to healthcare providers in Zambia." The words HIV, AIDS, and Zambia only mentioned once, and for this example, the less frequent words could have higher business insight compare to other words.

Amazon earning calls from quarter 4 2020, was predominantly focused on two of their services, Amazon Prime and Amazon Web Services(AWS). Compared to other more frequent words, the word "Prime" and "AWS" only mentioned 20 times each, and it has more meaningful business insight compare to more frequent words. Based on this observation, Amazon has

gained most of its revenue during the 4th quarter of 2020 through Amazon Prime subscription and AWS. For the next year, Amazon will continue to improve and develop in these two sectors.

Facebook earning calls has one of the most interesting topics compare to other technology or software companies. Between the 20 most frequent words, Facebook did not specify any meaningful business insight or product lines from the previous quarter or the upcoming quarter. Facebook spent most of the earning calls to discuss election topics in 2020. The CEO, Mark Zuckerberg has to spend his opening remarks on how the company handled election advertising, content, safety, and privacy. The word “election” was mentioned 8 times during the call, but it became one of the key topics during this session.

Google or Alphabet, Inc. is considered to have the most diverse product lines, including mail, search engines, cloud-based storage, youtube, etc. However, based on the analysis of the report earning call, the words Google, Youtube, and Cloud were mentioned the most during the call and it clearly correlates with the revenue stream and the growth of the company. One interesting business insight from this call was about COVID. Google has become the major search engine in the world and one of the challenges is to provide a reliable source of information to the general public. The word COVID does not appear on the 20 most frequent words, however, COVID news became one of the main topics throughout the earning calls because of the role Google has in 2020.

Earning call report is one of the most convoluted yet has the most important information for a company, investors, and the general public. Most of the time, earning report is covered by jargons and buzz words that are complicated for the general public. This report explains how Natural Language Program(NLP), could solve and simplified one of the most complex and time-consuming pieces of information. Based on the examples above, NLP could highlight not

only the most frequent word but also the less frequent word with a high business value. Tim Cook from Apple mentioned three words that were as important as the earning information but most likely overlooked by the audience. Facebook and Google have a similar example where the word “election” and “COVID’ became the discussion associated with the company. Amazon’s earnings report was highlighted by two of their product line; Amazon Prime and AWS. Natural Language Program(NLP) is one of the most powerful tools to communicate with large data sets and process the data effectively. Based on the 4 examples of the biggest companies in the world, the unstructured data of earning report call could be transformed into new business insight. Moreover, this process identified few key points based on the least frequent words and this process could make earning calls more effective and efficient.

References

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