INTA-6450 Course Project Proposal: Enron

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1 BACKGROUND

Enron formed from the merger of Houston Natural Gas and InterNorth in 1985 with a primary focus on natural gas. The 1978 -- Natural Gas Policy Act ends federal control over the wellhead price of "new" gas as of January 1, 1985. (LIHEAP). Logically they would want to expand into industries where comparable supply chain control would be profitable. Following the hiring of Jeffrey Skilling in Februray 12, 2001 and his resigning been the first entry of the figure below, the accounting schemes of Enron would become one of the largest financial scandals in history and a clear cautionary example to study.

Timeline of Critical Events for Enron in the Period August 2001 to December 2001

Date	Event
August 14, 2001	Jeff Skilling resigned as CEO, citing personal reasons. He was replaced by Kenneth Lay.
Mid- to late August	Sherron Watkins, an Enron vice president, wrote an anonymous letter to Kenneth Lay expressing concerns about the firm's accounting. She subsequently discussed her concerns with James Hecker, a former colleague and audit partner at Andersen, who contacted the Enron audit team.
October 12, 2001	An Arthur Andersen lawyer contacted a senior partner in Houston to remind him that company policy was not to retain documents that were no longer needed, prompting the shredding of documents.
October 16, 2001	Enron announces quarterly earnings of $393 million and nonrecurring charges of $1.01 billion after tax to reflect asset write-downs primarily for water and broadband businesses.
October 22, 2001	The Securities and Exchange Commission opened inquiries into a potential conflict of interest between Enron, its directors and its special partnerships.
November 8, 2001	Enron restated its financials for the prior four years to consolidate partnership arrangements retroactively. Earnings from 1997 to 2000 declined by $591 million, and debt for 2000 increased by $658 million.
November 9, 2001	Enron entered merger agreement with Dynegy.
November 28, 2001	Major credit rating agencies downgraded Enron's debt to junk bond status, making the firm liable to retire $4 billion of its $13 billion debt. Dynegy pulled out of the proposed merger.
December 2, 2001	Enron filed for bankruptcy in New York and simultaneously sued Dynegy for breach of contract.

2 DEFINITION OF WRONGDOING

The Merriam Webster definition of wrongdoing is short and concise.

Figure 1—Screenshot from the Merriam-Webster dictionary.

For my definition of wrongdoing, we need to have a context for which to deem something as evil or improper behavior or action. Thankfully here in the United States, we have financial regulatory bodies such as the SEC investigating potential instances where securities laws and fraud laws may be transgressed.

2.1 Accounting and Securities Fraud

Securities Fraud is a term that encompasses deceptive practices related to trading or offering of securities. It includes insider trading, misinformation and fraudulent schemes intended to mislead investors. This type of fraud violates securities laws and is subject to significant penalties. Accounting Fraud is the deliberate manipulation or misrepresentation of financial statements and accounting records to present a misleading view of a company's financial health. It can involve inflating revenues, hiding liabilities, or falsifying documents to deceive investors,

regulators, or other stakeholders. The goal is to maintain stock prices, avoid taxes, or meet shareholder expectations.

2.2 Wrongdoing in Enron

Special purpose entities are other companies that can be set up to do pieces of deals with just a little bit of outside money, but then don't require reporting all the details. Enron is famous for utilizing Special Purpose Entities to shell corporation their losses and recoup the loss in SPEs valuation through Enron backed loans. This act of misrepresentation ultimately caused many executives to be charged with fraud, insider trading, and conspiracy in 2006. The following were some of the key SPEs involved in the fraud.

- Chewco – Created to buy out the Joint Energy Development Investments (JEDI) partnership to keep debt off Enron's balance sheet.
- LJM1 and LJM2 – SPEs controlled by Enron CFO Andrew Fastow to transfer troubled assets from Enron's books while generating profits for Fastow.
- Raptors (I-IV) – A set of SPEs designed to hedge Enron's investments and manage its losses, but they were inadequately capitalized and entangled with Enron's own stock.
- JEDI (Joint Energy Development Investments) – A partnership between Enron and the California Public Employees' Retirement System (CalPERS) to invest in energy assets.
- Whitewing – A SPE used to buy Enron's troubled assets, which helped the company hide losses and inflate profits.
- Mahonia Ltd. – Used by Enron and JPMorgan Chase to disguise loans as energy trades.
- Big Doe – Another entity used to keep debt off Enron's balance sheet

3 PROVING WRONGDOING

The Enron Corpus is a database of over 600,000 emails. Even at a minute an email, that would take over 416 days to manually analyze. To get through all the data in a reasonable time scale, an automated multistep approach to filtering the data is likely necessary.

3.1 Strategy

Fortunately the corpus data is formatted as text so it can be parsed, tokenized and analyzed with common data science libraries and approaches. Tools such as The Natural Language Toolkit is an extensive open source library providing the tools for keyword-focused analysis

and sentiment analysis. Before we can do either step, the data needs to be preprocessed into a format NLTK can efficiently process.
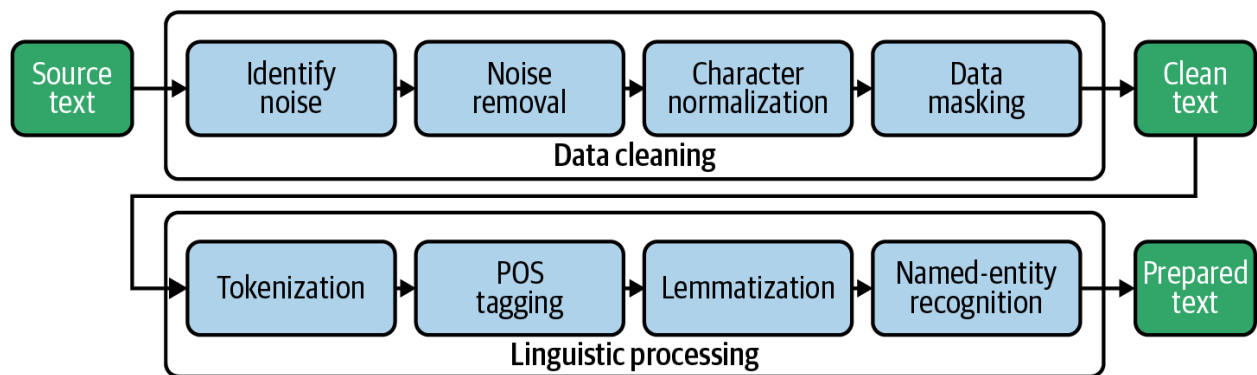
Due to the very public nature of the Enron scandal and dataset, the names of important figures and SPEs are well known. After the text is cleaned and prepared, keyword-focused analysis can take the well-known figures of the scandal and return a subset of emails removing business-as-usual emails from innocent bystanders. Those who are responsible for the scandal still make up a large amount of the total written communication. The second phase of analysis involves sentiment analysis to target emails that display either a very heavy positive tone for a bribe, or a very negative tone for a threat.

3.2 Method

1. Clean Data. This should be minimal based on where the corpus came from.
2. Prepare Data. NLTK has functions for tokenizing, removing stop words and WordNetLemmatizer
3. Apply a keyword based filter on the dataset.
4. Apply a SentimentIntensityAnalyzer to generate polarity_scores and filter the dataset targeting emails below a neutral score.

3.3 Potential Issues With Approach

The key-word and sentiment approach is a staged filter approach. Both the set of keywords and thresholds for positive and negative emotion would require careful tuning to both filter the corpus to a manageable level and retain critical information without overfitting. The sentiment approach is prone to missing veiled, obfuscated or coded language. To get around this a more nuanced language analysis would be appropriate. What is known about how brazen the figures

in this were, that is likely unnecessary. The also takes full advantage of the figures and entities being well known. That's not given in most circumstances.

4 REFERENCES

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