Using Sentiment Analysis on Unstructured Data to Identify Emerging Risk

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Abstract

These turbulent times make it challenging to manage a commercial loan portfolio while maintaining customer relationships. Staying connected with your customers' challenges and identifying early signs of defaults can help you manage risk across your portfolio more effectively.

Mining unstructured data sources (e.g., news, press releases, SEC filings/proxy statements, earnings call transcripts, etc.) for leading indicators of risk is a powerful way of staying connected with your customers. Recent advancements in AI have enabled sentiment analysis, key phrase extraction and trending to deliver actionable data, converting qualitative information into quantifiable data for decision-making. Thematic trending and market-level data can also be used to benchmark risk when limited company-specific data is available.

In addition to a general discussion, we will be highlighting the use of unstructured data and sentiment analysis to benchmark risk in two real-world case studies:

- Case 1: Pier 1 Imports
- Case 2: J. Crew

Using Unstructured Data to Perform Sentiment Analysis and Identify Emerging Risk

Bitvore helps organizations eliminate the time-consuming manual efforts associated with reviewing unstructured data sources (e.g., news, press releases, SEC filings/proxy statements, earnings call transcripts, etc.) to identify emerging risk and opportunity. Using business-critical insights from unstructured data, Bitvore can identify early warning signals and spot emerging risks to companies. Bitvore proprietary techniques help users understand material events that may fiscally impact their organization.

This paper will examine how sentiment analysis can help businesses identify risk and analyze two real-world examples using AI-based sentiment analysis techniques.

Why Use Sentiment Analysis?

As unstructured data volumes continue to grow, filtering through it all becomes more challenging. It can be complicated to extract and identify critical business information. Imagine sitting in front of an endless beach with billions of specks of sand, and small gemstones sprinkled just below the surface. Sifting through massive amounts of unstructured data for nuggets of value can feel as hopeless as trying to identify tiny gems on a large public beach. Sentiment analysis finds the jewels on the shore without having to sift through the entire beach by hand.

Unstructured data contains critical red flags and signals, however reading every available piece of information is not humanly possible. Sentiment analysis provides a measure of magnitude for red flags (or signals) and potential points of weakness in businesses.

The Basics of Sentiment Analysis

Sentiment analysis is an analytical tool for decision-making and is useful for many purposes, ranging from gauging political decisions to determining brand satisfaction. Two distinct variations of sentiment analysis exist: aspect-oriented and subjective sentiment analysis. Subjective sentiment analysis is binary using straightforward yes or no answers. In contrast, aspect-oriented analysis can isolate sentiment relative to specific entities or subjects.

Aspect-oriented analysis provides a reflection of attitudes or opinions about a specific subject or event. Instead of using a traditional binary "yes" or "no" approach, it provides additional context using multivariable analysis techniques. If an article contains numerous pieces of information, it can focus on a single variable, and the magnitude of one event can be measured using sentiment scoring metrics. Attributing sentiment scores to events can help determine if they are positive, negative, or neutral. Evaluating sentiment across all business-critical events allows you to assess overall company risk.

Sentiment analysis measures risk and leverages data science methods like natural language processing and deep learning to place a numerical value on a qualitative piece of information.

How Sentiment Analysis Works

Performing sentiment analysis uses an analytical approach that involves understanding sentence and word structure. A sentiment analyzer will classify words as verbs, nouns, and modifiers and assign a polarity for each, based on a lexicon of terms, similar to a dictionary but highly tuned to understand financial terminology.

The next step involves semantic orientation and linear sequencing. This method is critical to determine if a sentence is genuinely negative or positive. With semantic orientation, analyzers look at modifiers and terms together to infer context. For example, 'Despite the challenge' is a phrase that is positive in nature, though the individual words may be deemed negative. Linear sequencing looks at the order of a group of words to understand if a sentence is negative, neutral, or positive. For example, this sentence is full of negative phrases, but the sequencing of the phrases make the overall sentence positive: 'Everyone thought it was impossible, but Acme was able to overcome the challenges.'

The final step involves Deep Learning. Assigning a sentiment score to a sentence requires millions of data points to train sentiment models to understand the spectrum of sentiment. What is considered very negative vs. slightly negative or slightly positive vs. very positive, etc. Deep learning can help assess the relative magnitude of the data and determine whether the content is positive, negative, or neutral.

Understanding the Sentiment Spectrum

Deep learning is key to creating sentiment analysis and determining relative magnitude, first assessed at the sentence level before being evaluated at an article level. Final scores given to articles via sentiment analysis reveal whether the overall assessment is positive, neutral, or negative.

The sentiment spectrum provides overall scores ranging from -100 to 100 and reflects the negativity or positivity of an event.

Let's look at sentiment analysis using some real-life examples.

Case 1

Pier 1 Imports: Bankrupt Due to the Pandemic, But Had Instability Inklings Long Before

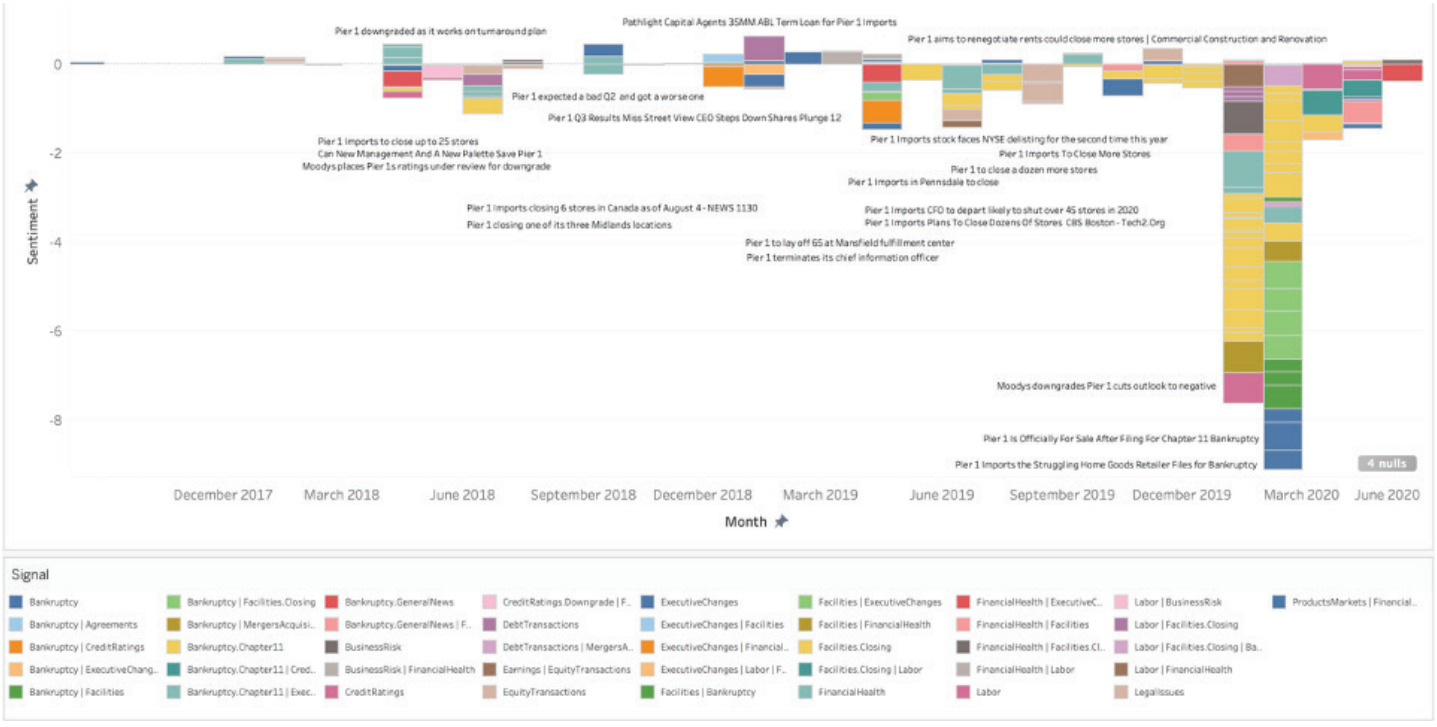

Figure 1 - Pier 1 Imports Sentiment Analysis on Business Signals Derived From Unstructured Data
(See page 8 for full size)

Disastrous events can happen to companies that affect their financial position and long-term viability. However, a string of less significant events typically provides an early warning. Sentiment analysis measures the relative impact of these events utilizing the cumulative scoring mechanisms described. Reviewing sentiment and signal data allows portfolio managers to determine red flags and analyze trends that may indicate potential risk factors, often long before the more significant events occur (e.g., a downgrade or bankruptcy).

Bitvore Cellenus Identified Key Events in the Pier 1 Timeline

Bitvore Cellenus was used to analyze events over a specified timeline for Pier 1 Imports. A downgrade occurred in Q1 2020, but there was a telling set of events that led up to it. Competitive pressures forced the company to rethink strategies and adjust their current business models. Senior leadership changes took place along with store closures in early 2018. Various activities, influencing sentiment analysis scores, occurred between downgrades indicating other potential risk factors, such as additional store closures, delisting concerns, missed earnings, executive turnovers, and distressed debt commitments. Distressed debt is oftentimes correlated with subsequent bankruptcies as companies struggle with cash flows. News stories indicating potential bankruptcy emerged in April of 2019 with ultimate bankruptcy in 1Q2020, citing "the pandemic." Having data like this allows users to understand patterns of events that ultimately lead to default, downgrades and potentially bankruptcies. Sentiment and signal data can be fed into predictive tools to drive credit underwriting decisions.

Sentiment Analysis Showed Negative Trends

The power of unstructured data and AI helps companies comprehend the cumulative effects of multiple material events that will likely impact client investments or relationships. Piecing bits of information together over time will provide a more explicit representation of a company's long-term stability and growth. By tracking sentiment over time and focusing on those companies with red flags and potential risk factors, Bitvore customers can carefully analyze specific material business events causing negative sentiments to occur. Bitvore's sentiment scoring helps organizations identify when critical analysis is needed and allows customers to make informed business decisions by identifying potential risk factors.

In the case of Pier 1 Imports, the sentiment and signals demonstrated typical patterns of an impending bankruptcy months before the event occurred.

Case 2

J. Crew Goes Bankrupt After Pandemic Lockdowns Start

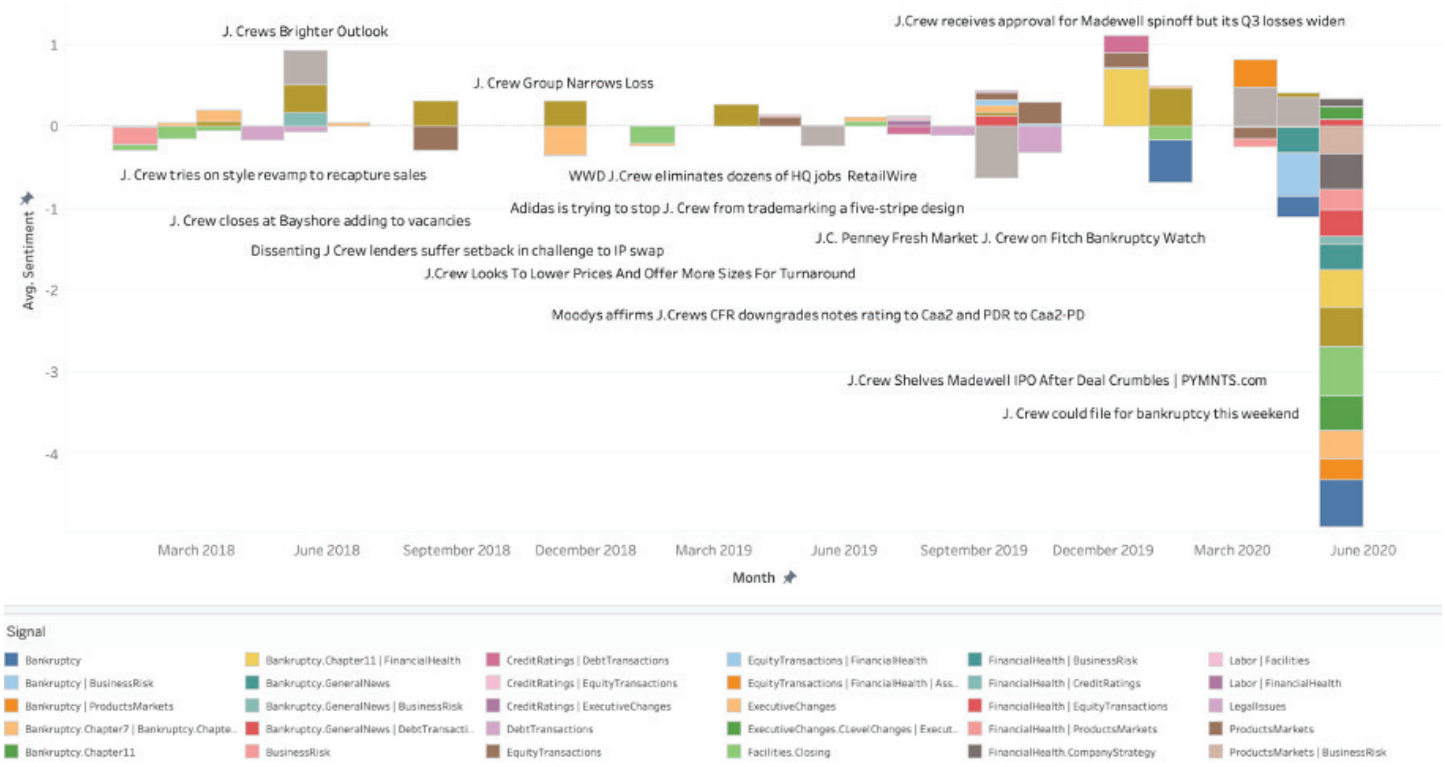

Figure 2 - J. Crew Sentiment Analysis on Business Signals Derived From Unstructured Data
(See page 9 for full size)

J. Crew had various significant red flags and compounding negative sentiment over the two years leading up to the actual pandemic. The pandemic simply pushed it over the edge, into bankruptcy. Two downgrades occurred in May 2019 and September 2019. Prior events also provided clear signs of corporate dysfunction and instability. For example, in November 2018, there was a mass exodus of staff and executive leadership changes. In January 2019, store closures occurred in four different regions. Although J. Crew eventually experienced temporary performance improvements, the financial difficulties soon became too much to bear.

Bitvore Cellenus Identified Issues Well Before Bankruptcy

Critical events such as legal issues and price fluctuations also signaled points of concern beforehand. Also noted by Bitvore sentiment data, clothing styles were revamped as a means of modernizing and keeping pace with competitors. Other signs of corporate dysfunction, such as product pivots, re-engineering feats, legal issues and leadership turnover indicated additional company performance issues.

Rumors of bankruptcy hit in April 2020 before it fully came to fruition in May 2020. Leveraging sentiment and signal data early on can help you maneuver and adjust your business strategy in advance of a downgrade decision or worst, a default or bankruptcy.

By tracking sentiment over time and focusing on companies with rapid decreases in sentiment, Bitvore's customers make informed financial decisions before their competitors, which is just the edge needed during these turbulent times.

How Bitvore is Using Sentiment Analysis to Improve Business

The amount of unstructured data available over the internet continues to expand at an ever-accelerating rate. Although having massive amounts of information at your disposal can be useful, attempting to sift through data to find relevant indicators of growth and risk can be challenging, time-consuming and honestly, just impossible without appropriate tools.

Sentiment Analysis Simplified

Developing useful analytical tools that apply sentiment analytics promptly can seem daunting to those unprepared. Data scientists often spend up to 60% to 80% of their resources integrating, normalizing, and cleansing unstructured data from multiple sources, severely impacting their ability to provide critical business insights.

AI-Ready Data

Bitvore Cellenus helps organizations eliminate time-intensive manual tasks by ingesting, analyzing, and delivering AI-Ready Data from unstructured data to help teams perform analysis to support business decisions and drive risk monitoring, prediction and recommendation engines. Bitvore data helps businesses identify emerging risks and opportunities to act according to marketplace changes as they evolve in virtual real-time, on a 24x7x365 basis.

Decision-Making Edge Via Sentiment Analysis

Bitvore reduces painstaking manual tasks typically associated with unstructured data analysis using specialized AI-techniques and machine learning models that incorporate sentiment analysis. Decision-makers use our tools to augment their abilities, reduce costs and focus their time on revenue-yielding strategies. Most importantly, Bitvore allows decision-makers to "see around the corner" when sentiment scores are trending downward to action a decision that can save a company millions of dollars in loan defaults.

To learn more about how the Bitvore Cellenus product line is improving business efficiency and augmenting human intelligence for fast and effective decision making, please visit **www.bitvore.com**.

About Mirella Reznic, VP Product Management & Innovation

As the VP of Product Management & Innovation, Mirella is responsible for defining the product vision and strategy and ensuring the execution of product delivery. She has over 22+ years of experience in product management across Financial Services. Before joining Bitvore, Mirella worked for JPMorgan Chase in their London offices, where she was the Head of Insurance across Europe Middle East and Africa for the Wealth Management division, overseeing $7 Billion in AUM. During her 12 years at JPMorgan, she led the creation of their Saudi Wealth Management business, and various product innovations across Mortgages, Banking, Treasury and Investments. She also led several large-scale global transformations in Pricing, Digital Transformation and Regulatory Compliance. Prior to that, she worked at MetLife and American Express across several international locations in Product Management, Innovation and Marketing.

About Bitvore

Bitvore provides unprecedented business insights from unstructured data. Our products are deployed in over seventy of the world's largest financial institutions, allowing them to make faster and more effective decisions so they outperform the competition. Our flagship product, Bitvore Cellenus is a groundbreaking AI-powered platform that delivers leading indicators of business performance for companies, industries, markets and municipal obligors. Consumable through file downloads, a comprehensive API and research user interfaces, Bitvore Cellenus provides customers with the "crystal ball" needed to identify emerging risk and opportunity. To learn more, visit **www.bitvore.com**.

Figure 1 - Pier 1 Imports Sentiment Analysis on Business Signals Derived from Unstructured Data

Figure 2 - J.Crew Sentiment Analysis on Business Signals Derived from Unstructured Data