

# Bitvore Cellenus Sentiment Scoring



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Bitvore provides data solutions that help organizations outperform the competition without the time-consuming efforts associated with manually sifting through news, press releases, SEC filings/proxy statements, earnings call transcripts and other unstructured data sources. As a leader in providing business critical insights from unstructured data, Bitvore has created a new way to help businesses identify emerging opportunity and risk. With our proprietary company, industry and market sentiment analysis, users can better understand how material business events are being perceived. With Bitvore Cellenus sentiment scoring, portfolio managers, credit risk underwriters, and other analysts can assess reputation, branding, and more. In this white paper, we'll dive into how the sentiment scoring system can be used to improve the decision making processes.

## What is Sentiment Analysis and How Does Bitvore's Proprietary Approach Work?

Unstructured data volume continues to grow, making it difficult for users to filter through the massive amounts of information available on the Internet. Sentiment analysis is a decision-making tool used by financial services professionals who lack the time required to sift through all this data to understand how companies, industries and markets are perceived.

Bitvore's proprietary sentiment analysis uses AI automation to understand and contextualize massive amounts of data. Built on machine learning and natural language processing (NLP) algorithms, it can determine the perception of a material business event derived from unstructured data without requiring an analyst to read the article themselves. Data mining techniques are used to extract perception from text based on word choice, context, and more. Additional techniques used include semantic orientation, linear sequencing, and deep learning. Utilizing this approach, users can determine whether a piece appears to be positive or negative, what the subject matter is, and the conveyed message.

The main objectives behind the development of Bitvore's sentiment analysis include:

- Data mining: used for analyzing entities, competitors, prospects, clients, and vendors
- Tracking a company, industry or market's reputation
- Reviewing marketing campaign success



# Types of Sentiment Analysis

There are essentially two types of sentiment analysis used in data science. The first requires parsing information into either subjective or objective categories. Applying this methodology can help to determine whether data contains predominantly positive or negative content. While this can provide a generalized overview, more sophisticated techniques are required for in-depth analysis.

A second data mining technique uses feature or aspect-oriented analysis. Using a three-step process, sentences are aggregated and defined using specified parameters to determine final sentiment scoring. Bitvore chose the latter approach for our sentiment analysis, which we'll now take a closer look at.

Bitvore uses a form of sentiment analysis that involves a three-step process that breaks down content at a sentence-by-sentence level. This technique encompasses the following:

- Sentence-by-sentence analysis
- Article sentiment calculation
- Entity-level calculation

Parameters are set for various attributes, including time period, entity name, type of entity, and more.

## Level 1: Dissecting Sentences

Techniques are applied to analyze articles at a sentence-by-sentence level. First, the sentence is parsed into components which classify words or phrases as modifiers, nouns, or verbs. Proprietary algorithms are then used to determine whether subject matter is classified as positive or negative.

Semantic orientation is used to assess modifier polarity and directionality. Linear sequencing then derives overall sentence direction based on the sequencing of words. Using semi-supervised deep learning with a lexicon of over 25,000 financial terms and a training set of more than 10 million pieces of content, relative magnitude of the sentence sentiment is assigned.

## Level 2: Article-Level Sentiment

Unstructured data record level sentiment scoring is provided on a sliding scale ranging from negative 100 to positive 100. As an example, a news article Bitvore ingested and analyzed with the title, "Revenue forecast drops \$200M on lower oil prices, production," was given a score of negative 45. Based on the tone and content of this article relative to other related pieces, it is considered to be mostly negative. A weighted title/first sentence scoring methodology is used to help determine overall data record scores

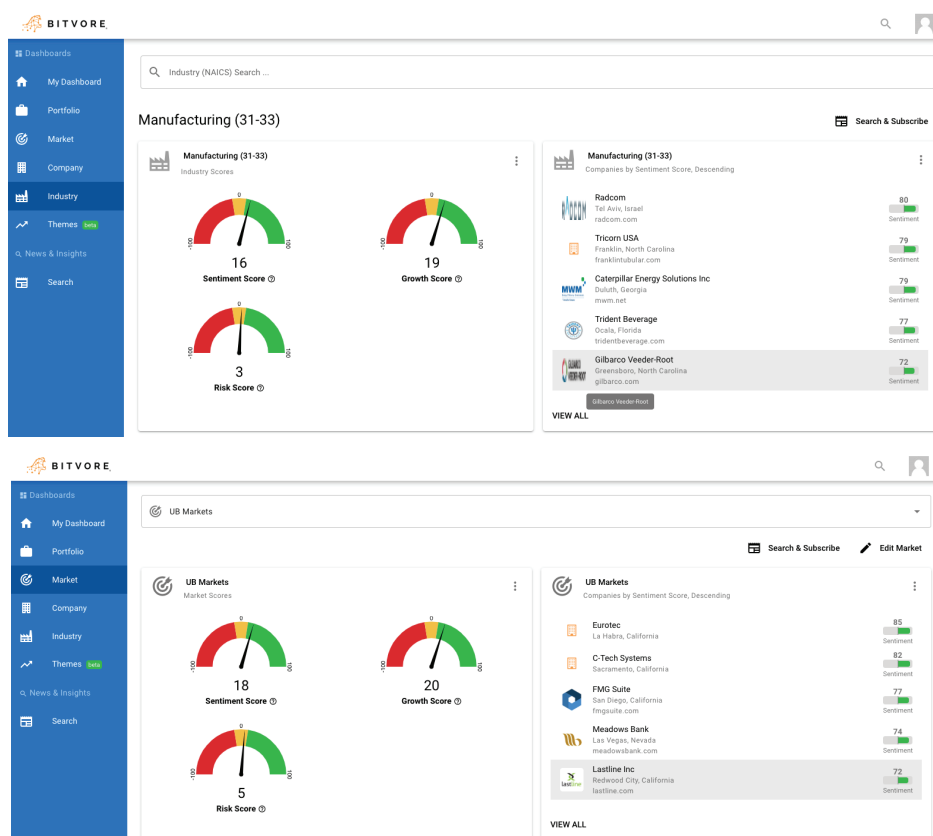


because they tend to become overly detailed after the first paragraph. Scores that are -10 or lower have negative sentiment, while scores of +10 or higher contain positive sentiment scores. Measurements falling between -10 and +10 are considered too neutral to make a valid determination of being positive or negative.

## Level 3: Company, Industry and Market Level

Company, Industry and Market-level sentiment scores are calculated daily on a rolling 90-day window based on all articles identified as material business events for each entity. Decay factors are used to favor more recent material business events identified from unstructured data records over those happening earlier in the 90-day rolling window.

The images below show examples of how Bitvore sentiment scores for industries, markets and companies can be represented graphically to users. In the examples, growth and risk scores are provided in addition to overall sentiment scores. The growth and risk scores are derived using sentiment for specific material business events that Bitvore tracks. Bitvore provides all data, including sentiment (article and company), growth and risk scores through a comprehensive API and historical and daily file downloads. Using the API, users can get intraday updates. Bitvore covers 500K global public and private companies with 5 years of fully analyzed historical data (available in Q2 2020).



Examples of Bitvore Cellenus Company, Industry and Custom Market Sentiment, Growth and Risk Scoring

## How Can Bitvore Sentiment Analysis Help Improve Your Business Results?

As mentioned earlier, the amount of unstructured data available over the Internet continues to grow at an exponential rate. Although having this massive amount of information at your disposal can heavily impact your business's performance, it can be challenging to digest it in any meaningful way due to the time-consuming nature of trying to sift through it all to find relevant leading indicators of growth and risk. Providing useful analysis in a timely manner can be a struggle. Data scientists often end up spending 60% to 80% of their resources, simply integrating, normalizing and cleansing unstructured data from multiple sources, which severely limits their ability to provide critical insights to the business.

Bitvore Cellenus helps your organization eliminate these massive manual tasks by ingesting, analyzing and delivering AI-Ready Data for data science teams to perform additional analysis on (e.g., predictive modeling) to support business analysts. Our new sentiment analysis and scoring can help your company identify emerging risk and opportunity so you can act first and outperform your competitors.

Bitvore reduces the painstaking manual tasks associated with unstructured data analysis using specialized AI-techniques and machine learning models. Decision-makers use our tools to expedite and improve the quality of their decision making processes, delivering immediate, quantifiable results.

If you would like to learn more about how the Bitvore Cellenus product line is improving business efficiency and augmenting human intelligence for faster and more effective decision making, please visit [www.bitvore.com](http://www.bitvore.com).

