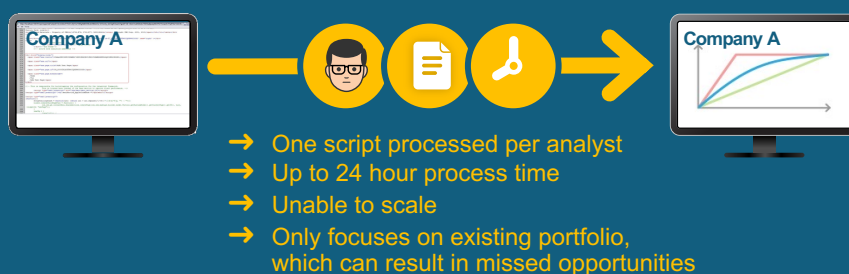


# WPS Analytics drives competitive advantage by enabling analysts to make faster informed decisions without having to read lengthy call transcripts, but instead having access to strategic insights automatically generated from the transcripts.

## Current analytical processing

Earnings calls are public tele-conference or web-conference calls in which a public company reports and discusses the financial results over a specific period, typically the last quarter. These calls are translated into call transcripts and made publicly available either by the company or a third party. These transcripts carry valuable information for parties making investment decisions on that business.

Portfolio managers involved in the asset screening process use call transcripts to select investable companies and implement attractive investment portfolios for their clients.



## Processing at scale

The biggest challenge in the time-consuming task of processing call transcripts is to identify the right candidates from the entire investable universe of thousands of companies. Analysts have to read through the most recent, often lengthy call transcripts and process the information in the right way to make a quick assessment of which point in the business cycle the company is currently at.

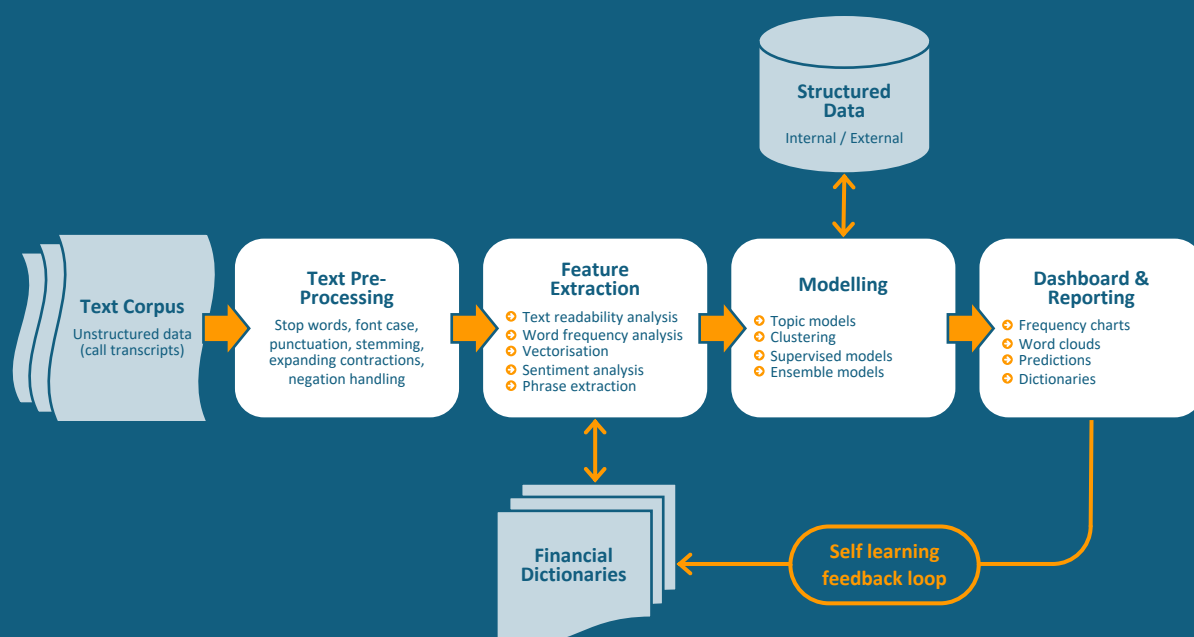
Sometimes the clue to a possible profit-warning would simply be a mismatch in tone between the company management team and analysts attending the earnings call, which only well trained and experienced analysts would recognise. So how can a business scale without extrapolating the number of experienced analysts?



## Our approach

We use Natural Language Processing (NLP) and analytics to generate insights from call transcripts. This approach has multiple facets.

- Starting with a text corpus. This consists of historical call transcripts written in English language.
- This encompasses the investment universe, chosen using an AUM threshold criteria.
- The corpus is selected over a specific time period, typically 2 to 5 years.



- The call transcripts are pre-processed by removing irrelevant words (stop words) and punctuation, applying uniform font cases, expanding contractions, handling negations and applying word stemming.
- Features are extracted from the normalised text based on various criteria including text readability, word frequency, various sentiment scores and phrase detections. Often, public and/or proprietary financial dictionaries are used for sentiment analysis and vectorisation. Extracted features are used as predictors.
- Typically, several model candidates are created using various modelling techniques before deciding on a model champion.
- Custom dashboards provide reports and visualisations, such as frequency charts and word clouds.
- Reports are designed to provide model prediction results, trend analysis, dictionaries and key words extracted from call transcripts.
- Existing financial dictionaries can be expanded by key words selected from the reports through a self-learning feedback loop.

## Case study example

A profit warning is a declaration issued by a company to inform investors that the company is going to make a significant loss in the next quarter. Companies in crisis would make every effort to delay that announcement.

Despite the availability of richly structured data and sophisticated tools, investors often fail in such early predictions. However, managerial awareness of an inevitable crisis might be subtly reflected in earnings reports that are published prior to a profit warning being formally announced.

Such transcripts may act as a proxy for a 'polygraph' where certain hidden text patterns, not easily detected by experts, may be revealed by artificial intelligence. In this way, call transcripts can be used to predict profit warnings before they are issued.

We start by collecting historical call transcripts that took place around 120 days before a profit warning was issued and use them to train a predictive model. We also compare the transcripts with a selected sample of transcripts that are not associated with profit warnings. As each transcript has two significant sections, managerial and analyst (i.e. questions and answers), we analyze the two sections separately.

Valuable insights are presented to the stakeholders and their feedback is used for any potential adjustment. The figures below provide illustrative examples of such insights.

Difficult Words Score		
Profit Warning	Managerial Section	Analysts Section
No	412	411
Yes	419	455

Figure 1

Text Uncertainty Score		
Profit Warning	Managerial Section	Analysts Section
No	390	290
Yes	330	330

Figure 2

One simple insight is that the average number of difficult words is higher for profit-warning companies in the analysts' section. This number tends to be similar for both profit-warning and non-profit-warning companies in the managerial part. Figure 1 is an example of the average score of difficult words per document. Similarly, the average score for uncertainty is higher for profit-warning companies in the analysts' section, whilst this is reversed in the managerial part indicating that managers might tend to subconsciously conceal uncertainty. Figure 2 is an example of the average score of expressed uncertainty per document. Using a selection of relevant words and phrases is crucial for the success of this analysis.

Various techniques can be used for the extraction of bigrams - adjust ebitda, free cash-flow, government shutdown, decrease year-over-year transformation initiatives, increase last-quarter. Or, trigrams - federal government shutdown, building fibre-network, turn adjust ebitda. Portfolio managers may have the final decision in the selection of the most relevant phrases and words.

Generating word clouds, such as the examples in Figure 3, and frequency charts are intuitive and powerful visual tools that can help to provide insights to guide the analyses that occurs before the modelling phase.



Figure 3



## Our delivery

We provide a web based service for call transcript analysis and insights. This service can be tailored to support specific business needs but our standard offering includes:

- Transformation of unstructured call transcripts into structured data. This enables combining with existing internal/external structured data, facilitating superior analysis such as early prediction of profit warnings based on the recent earnings call and company's current business cycle.
- Overall sentiment score of a call transcript.
- Trend analysis of call transcripts over time.

The web service can be invoked in asynchronous mode (batch processing), or in synchronous mode (on-demand) which is based on the use of REST API protocols. API requests typically require a company's unique symbol and desired quarter, and API responses depend on the service type and company's business cycle but typically include call transcript's sentiment score and a key words list.

## Our approach to services

<b>Business</b>	We focus on business requirements that have a direct impact on KPI's. Our consultants achieve this by focusing on systematic business and data understanding via active stakeholder involvement, workshops, frequent business playback and our in-house field experts.
<b>Data Science</b>	Data science and artificial intelligence are built into our software services. We mine data using our WPS Analytics software and make services available via our WPS Hub platform. We use CRISP-DM, the leading industry methodology, for data mining.
<b>Software Development</b>	The WPS Analytics platform allows unlimited software packages to be created in the languages of SAS, Python and R, with use of machine and deep learning technologies. Agile/Scrum methodology, specially designed for software development, is our chosen project management process. This provides a customer-centric approach, rapid project development (typically 8 to 12 weeks) with continuous delivery, resulting in fit for purpose solutions.