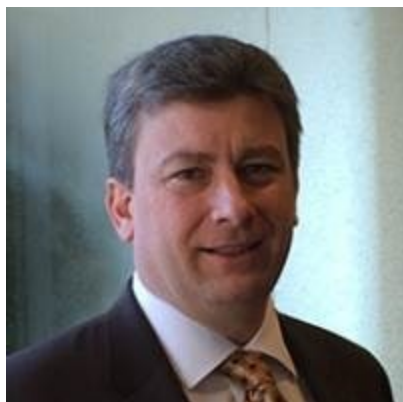


## Speech Craft Analytics - Layering Audio Analytics on Top of Natural Language Processing to Provide Key Performance Indicators for Call Centers, Hedge Funds, Trial Deposition Preparation and Top Executives on Earnings Calls



**David Pope**  
Founder  
Speech Craft Analytics

**Interview conducted by:**  
**Lynn Fosse, Senior Editor**  
**CEOCFO Magazine**

**CEOCFO: *Mr. Pope, what is the concept behind Speech Craft Analytics?***

**Mr. Pope:** Speech Craft analyzes the words that people speak and then complements those with voice tone. We look for areas where the words convey one message and the voice another, or where there is double confirmation that both are saying the same thing.

**CEOCFO: *Why do we want to do this?***

**Mr. Pope:** The idea is to get into the mind of the speaker. An example might be on a company earnings call where an executive may be using optimistic words but his tone shows hesitation and nervousness. We can then understand that perhaps the executive is not quite as confident as they are making themselves out to be. The topic the executive expressed hesitation about would be cause for further exploration.

**CEOCFO: *How do you know what the voice tone or tone of speech might be through your analytics?***

**Mr. Pope:** We create a baseline, so if we have a lot of examples or the person has been speaking in a conference call for a long period then we look for deviation to that baseline. Some voice attributes are similar across all people and all languages. We analyze numerous vocal attributes such as shimmer, jitter. These are deviations in pitch and volume. Those are indications of nervousness or the absence of those would be indications of comfort.

**CEOCFO: *Does it vary between men and women, ethnic groups and nationalities?***

**Mr. Pope:** I cannot speak to ethnic groups and nationalities but we do want to focus on native English speakers or native speakers. If the speaker is not a native speaker, their speech patterns will reflect that. Hesitation and nervousness may just be searching for the correct words. Concerning women, there are differences. Women tend to speak with a higher pitch. However, women have a lower variation in that pitch, men have a wider range on average in their pitch than women.

**CEOCFO: *Would you tell us about how you created the system you are using today?***

**Mr. Pope:** I had been working in natural language processing (NLP) for the last seven years and have been cited in numerous places for that work. Natural language processing focuses on the words that one speaks. Natural Language Processing analyzes sentiment, complexity, transparency, hesitation, and other indications of what is in the mind of the individual from the words that they choose.

Recently with the advancements in AI, we have advanced our capability to layer on vocal analytics, which provides a richer insight into what the speaker is saying. You lose so much in a transcript - you often lose the 'ahs' and 'ums', hesitations and laughs, tone, and speech rate.

Now we can layer audio analytics on top of NLP. I think of audio analytics as the second wave. The third wave will be the facial recognition and analyzing what is happening with the speaker's physical actions.



**CEOCFO: *Who is using Speech Craft Analytics?***

**Mr. Pope:** There are several applications. The place where the application is the most mature is in call centers where a call center categorizes their callers into happy, angry, looking for hate speech or profanity, so that they can create metrics or KPIs (Key Performance Indicators) for what is happening with their customers. Another application where there are a few players is hedge funds. Hedge Funds create trading signals around the natural language processing approach that I explained but also complement that with audio analytics.

Other areas that are employing this technology is the legal field for deposition analysis, trial and deposition preparation. Another use case is for investor relations where senior executives may want to coach CEOs and CFOs as to how to prepare their presentations on the earnings call. On company earnings calls there are more algorithms analyzing what executives say, than people. Speaking to the algorithms is increasingly important.

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**CEOCFO: *Do you provide real-time results or does the analysis start when the whole speech or recording is completed?***

**Mr. Pope:** We do not, Speech Craft processes with a delay in order to create a baseline. Once a recording is completed, we can then start our work. The technology is there to create near real-time analysis but we are not doing that at the moment. Hedge funds may want the signal in near real-time depending upon their strategy but we prefer to have the entire recording.

**CEOCFO: *How are you introducing Speech Craft Analytics, and what has been the reception overall?***

**Mr. Pope:** There is a lot of curiosity and interest in the technology and it makes obvious sense to humans, as this is the way we process speech. To do this algorithmically allows a faster and more thorough approach. Since we are analyzing speech at the 30-millisecond level, we are picking up frequencies and vocal cues that are inaudible to people.

There is also a bit of tentativeness about this. This is a new burgeoning area and many prefer to see white papers or academic work in the area. Others may be hesitant to be an early adopter. The reception has been a combination of excitement and tentativeness.

**CEO CFO: *What is your business model?***

**Mr. Pope:** The business model is to pursue a consulting approach with a package that entails a number of audio hours of analysis. If a deposition is seven audio hours, we provide a package for a number of depositions.



**CEO CFO: *Do you see at some point working with other business consultants or organizations that might want to partner with you to have this available to their clients?***

**Mr. Pope:** Absolutely! For example, forensic accounting; there are several firms already specialize in voice tone analysis but it is manual. These are folks who are ex-CIA or interrogators but are approaching the same sort of problem but from a manual standpoint. This would be an accelerant for their work. Investment managers who scrutinize company management would also be logical partners.

**CEO CFO: *We came upon Speech Craft Analytics from a press release at about Evaluating GOP Candidates Debate Words and Voice Tone; what can you tell us about that?***

**Mr. Pope:** The work looked at the voice tone based on six audio metrics and six natural language processing metrics. We created a scorecard and then ranked each of the candidates based on the scorecard. We looked at modal words, which are either strong modal words, such as the use of words like 'will' and 'shall' or weak modal words like 'generally' or 'sometimes', as well as other word choice attributes.

On the voice side, we look at metrics like pitch, shimmer, jitter, and tone. Traditionally mature, confident leaders have a harmonic property to their voice which makes it pleasant to listen to and they tend to speak with a low steady tone even when challenged. We identified the candidates who ranked at the top of our scorecard as well as the bottom of the scorecard.

**CEO CFO: *How difficult or easy might it be for someone to change the way they speak?***

**Mr. Pope:** With training people can change the way they speak. I am hesitant to perform this analysis on actors and actresses because they are practiced at remaining 'in character'. With practice we can all improve our delivery. Those politicians who are the most experienced, having given many speeches in many different formats, have refined their approach and speak with a steady, calm, and intentional voice at an appropriate speed even when they are challenged and things become emotionally charged. They maintain their composure and project themselves as much more confident and presidential.

**CEO CFO: *Do you find yourself listening to people in a different way in private or casual conversations as you are so involved with voice?***

**Mr. Pope:** I do, and there are subtle cues that people give often, particularly with deception. Deception is tricky and it is hard to say when somebody is engaging in deception but there are markers. You look for clusters of those deception markers. My ears have become increasingly attuned to those markers.

**CEOCFO:** *Are you seeking funding, investments, or partnerships?*

**Mr. Pope:** Speech Craft is all set for funding. We are always looking for partnerships and are interested in speaking with people who are working on forward-looking, cutting-edge technologies that would be a complement.

**CEOCFO:** *What surprised you as the company has grown and developed to where you are today?*

**Mr. Pope:** What surprised me most was the rapid pace of technology advancements. We can do things now that we were not able to do six months ago. What we can do is cheaper and faster than even six months ago. That is the biggest surprise.

**CEOCFO:** *Might this technology be used by law enforcement to replace the lie detector or even eventually become admissible in courts?*

**Mr. Pope:** For law enforcement there is a powerful use case for interrogations. The admissibility of voice analysis in court is tricky. There is some precedence around polygraphs being admitted into court. I cannot speak to what the admissibility of AI generated vocal analytics will be. For high-stress situations where people are untrained in these techniques, people often give and project a lot of information through their voice dynamics.

**CEOCFO:** *What have you learned as you are doing more and more analysis?*

**Mr. Pope:** I have learned that this work touches nearly every human interaction. It could be a poker bluff, it could be games that people play, normal interactions that we all have, and mildly stressful situations that we all have encountered with each other. As a result, there are so many interesting applications of our work.

**CEOCFO:** *With all the new ideas to look at in AI and technology, why pay attention to Speech Craft Analytics? Why is the company and the concept important?*

**Mr. Pope:** This is a capability and tool that will allow individuals to have a deeper, fuller understanding of the interactions they have. From that, they can make smarter decisions whether it is a business decision, or better understand the mindset of the person they are interacting with whether they are nervous or confident, and possibly even if there are areas to explore further in terms of authenticity and deception.