



How Call Progress Analysis Optimizes Call Routing

to Save Time, Money,
and Build ROI



What You Face

Like many industries, time is money for contact centers. Contact centers use predictive dialers to optimize their operations to filter out a percentage of unwanted or unproductive calls without incurring the expense of agent interaction. However, if the technology cannot accurately detect a non-human response, it may bring in an unneeded representative, wasting precious time that could be used more productively.

The challenge with using predictive dialers effectively lies within detecting “leading silence,” or the amount of time that goes by before a human answers a call. Without knowing this information, agents may not know if they should join a call or not.

Enter advanced automated dialers with call screening capabilities, known as Call Progress Analysis (CPA). The signal processing algorithms can distinguish the difference between live parties, answering machines, and even voicemail services answering and filtering calls. With CPA, only those calls answered by live parties are passed to agents. CPA ensures every second counts from an operational perspective — maximizing time and effort, cutting costs, boosting efficiency, and creating a tangible return on investment.



60% of dialed phone numbers go unanswered



Each call has an average of 15-20 seconds of delay before being picked up



Even answered calls aren't picked up immediately

What is Call Progress Analysis (CPA)?

LumenVox Call Progress Analysis (CPA) accurately determines whether a human or machine has answered the call. It does so using our advanced Voice Activity Detection (VAD) algorithm that filters out non-speech sounds to zero in on human speech. Traditional energy-based approaches detect speech simply through loudness. It's inferior because any noise can trigger it.

Once it determines whether it has reached a live person, your application can decide what to do: play the message at the beginning of the call, send live humans to an agent, or drop the call into an Interactive Voice Response (IVR) system. Or, if it detects a machine, it uses a combination of tone-based and voice activity detection to know when to start playing the message.

Either way, your message sounds more professional because it starts precisely where it should.

CPA leverages the strengths of the LumenVox Speech Recognizer, in combination with our tone detection, to get this right. In addition to leading silence and the greeting spoken by whoever answers the call, there is another critical timing aspect to consider: the End of Speech Delay.

This means the algorithm must know how long to wait to determine the person has entirely stopped speaking. This delay may simply be a pause in someone's speech, for example, between words or while hesitating—not necessarily when they have finished. Therefore, it is essential to get this timing right so you do not inadvertently cut someone off.

Why? Because the cost for error is too high. Returning a premature result may increase the chances of a recorded message containing only a slight pause being classified as a human. This misclassification can result in a machine being routed to an agent.

Within LumenVox Call Progress Analysis, there are two different methodologies available to speech application developers, allowing them to decide how the timing of Call Progress Analysis results should be approached; Default or Maximum Time from Connect. The former defines a maximum amount of silence for which to wait. The latter is a newer timing method for applications that demand a classification response within a very firmly defined time limit.

1 Billion

successful outbound calls are made monthly by a CPA user

10,000 +

simultaneous calls handled by CPA for one client

98.5% Accuracy

with CPA technology

How CPA Works

LumenVox Call Progress Analysis differs from our competitors because our roots are firmly planted in the telephony and contact center space, successfully processing speech at scale.

With every call, there is a certain amount of signal noise, background noise, microphone noise, echo, or static likely to be present. Each sound needs to be intelligently interpreted when making classifications. To get this sophisticated interpretation, LumenVox utilizes our own third-generation artificial intelligence solution, based on machine learning, leveraging large quantities of cultivated call data.

Pre-Connect vs. Post-Connect Audio

LumenVox's CPA solution enables the pre-connect processing of audio streams before the call is answered, unlike the more common method of post-connect processing. The technology features SIT and Busy Tone detection, which can detect that a call cannot be completed before it's answered.

There are four outcomes from a LumenVox Call Progress Analysis prediction:

1. Unknown Silence

no human speech was detected

2. Human Residence

a short greeting, such as "Hello, this is John," was detected

3. Human Business

A longer "business greeting" type utterance of human speech was detected (e.g., "Hi, welcome to LumenVox, how may I direct your call today?")

4. Unknown Speech

A human utterance longer than a typical greeting was detected, usually indicating the call has reached a voicemail or non-human

How You Benefit From CPA

LumenVox's analysis of deployed Call Progress Analysis shows that it is highly effective in reducing call center costs by increased automation and call filtering. Benefits include:



Fewer abandoned calls that improve CX and efficiency

The live detection approach allows agents to spend more time speaking with their intended call recipients and, as a result, dramatically increases the overall productivity of the contact center. LumenVox Call Progress Analysis takes this live detection approach to the next level, offering call center agents and predictive dialer developers the core technology to quickly and accurately classify whether a human or a machine answered calls. This ability creates the most effective predictive dialing solutions.



Dramatic reduction in agent idle time

LumenVox Call Progress Analysis' predictive process determines when the next agent will become available using statistical analysis of current call volume and average handling times, etc. This maximizes agent productive time by reducing typical idle time from 20 minutes per hour, to about 3 minutes per hour.

For example, suppose a typical call lasts for around 80 seconds, and it takes on average 10 seconds for someone to answer a call. In that case, the predictive dialer can begin dialing when the agent is 70 seconds into the call, anticipating being freed up in time to take the next answered call.

How You Benefit From CPA (cont.)



Better call center efficiency that saves you money & creates ROI

The benefit is dramatic. LumenVox Call Progress Analysis can mean an average savings of over \$7 million per year for a call center with 400 agents. Not only can this contribute to significant operational cost savings for a call center, but it also impacts your overall competitive advantage.



Higher accuracy in message payload delivery

This advanced technology can be applied to a variety of use cases. For example, some applications are designed to deliver messages to recipients. Once the call has begun, the outbound system waits for a short period, listening for the presence of a greeting message (from a human or machine) before deciding how to proceed. If a human is detected, the message can play as desired, whereas if a machine is detected, the call flow could wait until speech ends, potentially allowing much longer for this to occur than when performing predictive dialing for an agent before message delivery.

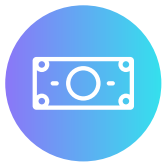
High-accuracy Call Progress Analysis classification makes this call flow successful. If a decision was made that a human was detected and the message starts playing out, LumenVox Call Progress Analysis listens for an answering machine beep or tone. If this is detected at any time while the message is being delivered, the call flow can simply restart the message. In this way, the answering machine receives the entire message that was intended.

Any organization can quickly develop applications leveraging LumenVox Call Progress Analysis using our online documentation, example applications, award-winning support team, and network of partners.

CPA by the Numbers



Agent idle time fell from **33%**
to just **5%** when using CPA



Close rates in some cases
improve by **10%**



CPA's call time optimizations can save an
average of **\$7 million** annually for a
400-agent call center



LumenVox: The Brains Behind CPA

LumenVox is an industry-leading provider of speech-enabling software, bringing the power of voice to more than 2,000 customers worldwide and facilitating billions of customer interactions. The LumenVox software portfolio consists of Automatic Speech Recognition (ASR), Call Progress Analysis (CPA), Voice Biometrics and Text-to-Speech (TTS). Designed to be highly flexible, accurate and scalable, LumenVox helps some of the world's largest cloud-first companies reimagine customer engagement by delivering exceptional voice experiences.

20 Years

of experience and research with market-leading, proprietary Voice Activity Detection (VAD) algorithms and signal processing technology

Find out more about what LumenVox and CPA can do for your business.

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