White Paper

SERTAINTY™

Automated Quality Monitoring

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About SER

Since 1989, SER has delivered quality call management systems that provide the highest level of system reliability, productivity, and customer communication.

Known for their reliability and quality, SER's contact center solutions generate key business results including improved customer service, reduced costs, and the flexibility to scale with client growth. Today, 8 of the top 10 outbound teleservices companies in the United States use SER's contact center solutions. Behind SER's products and services is a team of professionals who are fully committed to delivering quality customer service to our customers worldwide.

Recently, SER extended its leadership in delivering next-generation contact center solutions with the introduction of SERTAINTY and SERTIFY™. Designed for both inbound and outbound contact centers, these pioneering automated quality monitoring and call validation solutions provide a demonstrable ROI and promise to revolutionize the way contact centers operate today.

SER Solutions, Inc. is headquartered in Dulles, Virginia with operations in North America and Europe.

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Introduction

For many businesses, the primary interface between the company and its customers is the contact center. As its importance has grown, the contact center has become a crucial component that directly affects a company's overall success. One negative customer experience can forever jeopardize the relationship between the customer and company.

To ensure that customers receive a high level of service, contact centers typically employ quality assurance managers who monitor a random sampling of calls. However, listening to a random sample is, at best, a balancing act between the desired quality goal and the expense of a large staff of reviewers. To further illustrate the point, consider the following:

> *Almost all contact centers that record calls for monitoring purposes record more calls than they ever listen to. In one example, a large financial institution records 100% of their calls. However, less than 1% of the calls are actually listened to by quality monitors. Statistics have shown that 85% of all calls listened to by their quality monitors routinely fall within the norm for a satisfactory customer contact. This means that, with their current practices, most of the calls being monitored are not instrumental in modifying agent behavior in their contact center.*

We can conclude from this example that the quality monitoring team spends the majority of their time listening to benign calls while the calls that most need to be reviewed are missed. Similarly, without a sufficiently large sample of calls, important trends may not be apparent.

Although it is desirable, contact centers do not monitor every call using today's methods. This is due to the significant costs associated to staff enough personnel to listen to all calls. Even when using a playback feature to listen to calls at double or quadruple speed, quality monitoring is extremely time and labor intensive.

The key to a superior quality monitoring program is the ability to review 100% of calls without the associated time requirements and financial costs.

100% Quality Monitoring

While essential to delivering superior customer service, today's method of ensuring quality call handling by your agents is a costly and time-consuming operation. SER has a better solution.

SERTAINTY is the world's first application that uses business rules combined with unrestricted, natural speech recognition to monitor conversations in a customer interaction environment, literally transforming the spoken word into retrievable data. SERTAINTY automates call monitoring activities to evaluate and directly improve agent-customer interactions. Rather than monitoring only a small fraction of all the calls made in the contact center, SERTAINTY performs highly accurate, automated evaluations of all customer interactions. By automating the time-consuming aspect of monitoring calls, SERTAINTY empowers contact center management to address quality issues, more accurately measure, coach and reward agents, and identify business-critical trends.

SERTAINTY significantly decreases the amount of manual involvement that is required for monitoring agent activity. It provides a facility to actively monitor for script adherence by scoring Key Performance Indicators (KPIs) and ensures compliance by verifying that required statements are made in the context of the conversation. Additionally, SERTAINTY has the ability to identify required words or phrases that were omitted in an interaction with a customer.

SERTAINTY is intended to work along side current recording applications. It delivers extremely accurate high-speed audio processing and search capability for the quality monitoring process. The result is dramatically reduced costs associated with the fundamental contact center operating requirement of monitoring, while improving overall productivity.

SERTAINTY's underlying audio processing and search technology does not rely upon a predetermined word recognition dictionary. As a result, recorded conversations can be stored and subsequently audited or searched for any combination of sounds (words), or lack thereof, and can be combined with traditional data forms in an SQL-like query. Essentially, SERTAINTY processes audio once and then, like other stored data, the output can be searched over and over again. Audio processing occurs at approximately 8 times faster than real time (e.g., 60 minutes of audio can be processed in 7.5 minutes) and subsequent searches can be performed at speeds as great as 100,000 times faster than real time. The time saved and hardware costs associated with this technology offer a significant differentiator over any other competitive product.

Quality Assurance

With all calls subject to review, SERTAINTY provides a holistic view of the level of quality service delivered by your contact center and ensures that poor customer interactions are quickly flagged for review and action. Most importantly, SERTAINTY empowers the quality monitoring team to focus on those calls that necessitate action.

As SERTAINTY analyzes a call, it creates database entries reflecting the results of the analysis based on a contact center's KPIs - business rules associated with a call to measure the quality of the call. The specific statistics maintained in the database are customizable within SERTAINTY and can be aggregated on several levels such as per agent, per group, per channel, per device, and per location.

Statistics can be viewed graphically, as depicted below:

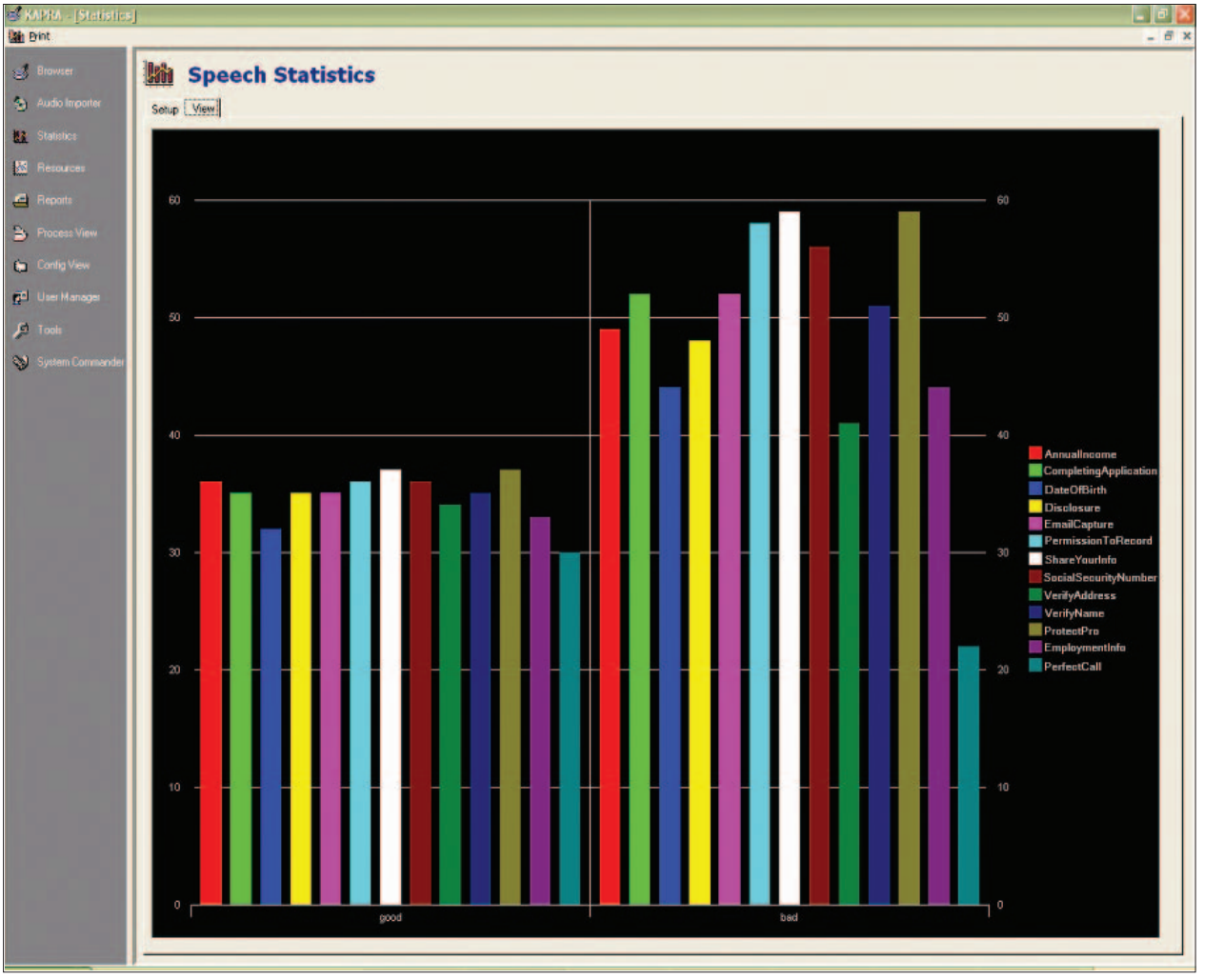

Figure 1
Graphical summaries in SERTAINTY provide call reviewers powerful and flexible tools to ensure 100% quality monitoring.

To facilitate greater efficiency, when SERTAINTY flags a call for review, the system marks the point in the call where a KPI is measured. As a result, rather than having to listen to the entire call, the quality monitoring staff is able to review only the pertinent section of the call—a considerable time savings over having to listen to a call end-to-end.

In addition, SERTAINTY's user-friendly graphical user interface (GUI), Call Reviewer, keeps all call information within a simple mouse click, as shown below:

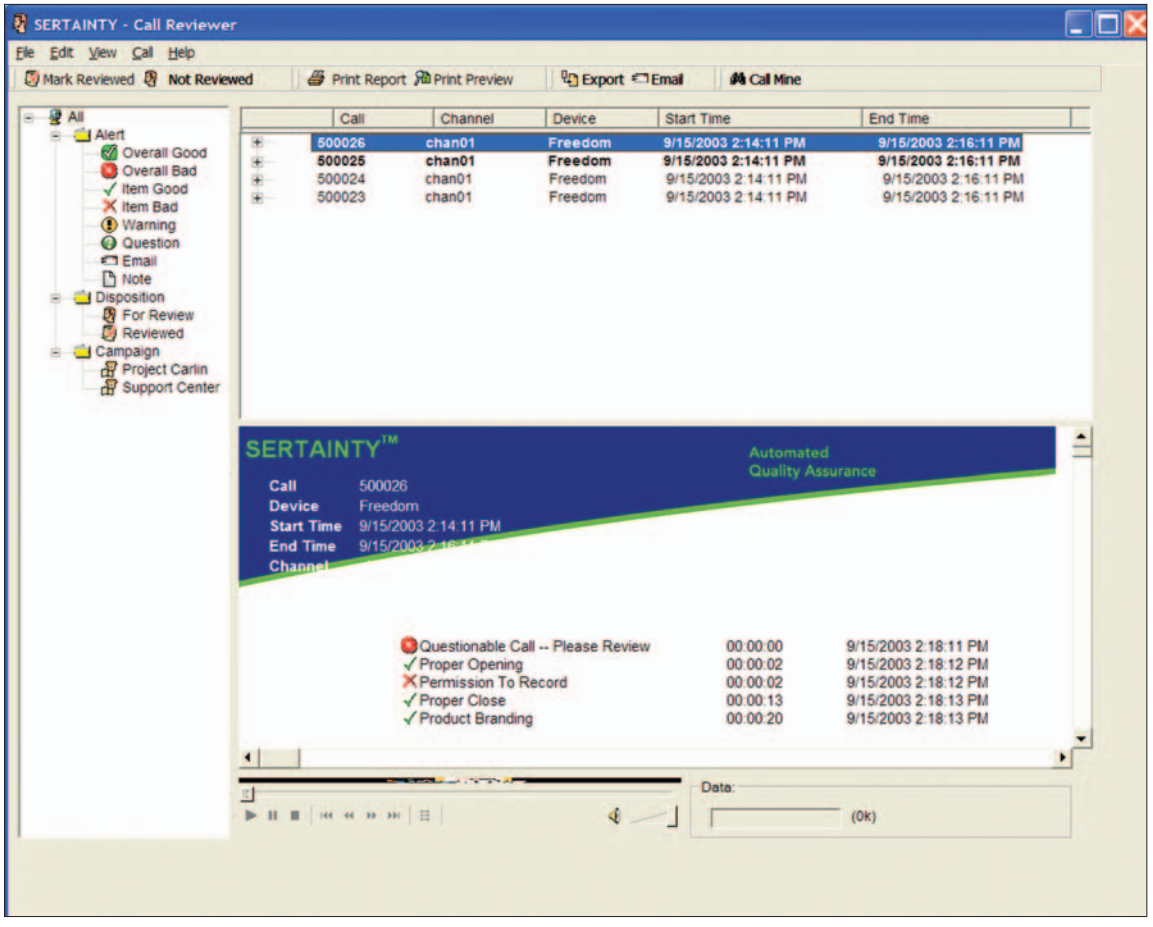

Figure 2
SERTAINTY delivers powerful, easy-to-use quality monitoring capabilities to evaluate and improve agent-customer interactions.

Measuring, Coaching, and Rewarding

SERTAINTY creates significant opportunities for contact center managers to measure, coach, and reward their agents. A key differentiator is SERTAINTY's ability to operate on data, such as information about the caller and the results of the call (e.g., sale, not interested, no answer), as well as the actual phrases spoken during the call. This culminates in the ability to integrate business knowledge (e.g., customer information) with knowledge about the contents of a call to achieve a truly comprehensive view that was previously unavailable for measuring and managing agents. This new level of qualitative information can be leveraged to help make business decisions as well as make a greater number of agents successful. Ultimately, this combination results in a better customer experience.

In an effort to improve overall results, contact centers typically implement reward programs predicated upon a quantitative measurement of results - usually for the highest sales conversion rate. These reward programs, however, do little to help average agents become more successful because they focus on the results instead of the process. Because SERTAINTY monitors both quantitative and qualitative KPIs, contact centers now have a powerful tool that can manage and improve the call process (e.g., the script) as well as the results.

For example, suppose a customer is purchasing a toy and the script suggests the purchase of batteries. Even a small conversion rate on the batteries could have a significant monetary impact. The ability to measure the contents of the call allows the request for batteries to be a factor in a rewards program. If agents are rewarded for making the request, the likelihood is higher that they will do so.

SERTAINTY empowers the quality monitoring team to promptly be alerted to calls that do not meet KPIs, enabling them to quickly and appropriately coach their agents. This translates directly to increased sales, which impacts the enterprise's bottom line. Equally important, successful agents are more likely to remain employed, reducing attrition and the costs associated with recruiting and training.

Trend Identification

Beyond automating quality monitoring processes and measuring, coaching, and rewarding contact center agents, SERTAINTY can be used to reveal valuable customer information or identify trends. This information can be leveraged to pinpoint customer issues or additional revenue opportunities (e.g. "your product's too expensive" or "Company XYZ offers more options") to enable faster response by the company.

SERTAINTY can also perform high-speed searches on previously archived audio files to mine for information and trends. There are often regulatory requirements to store audio files for several years. Prior to the availability of this feature, stored audio files provided contact centers little value because there was no economically sound way to conduct trend analysis on them. SERTAINTY removes this obstacle and unlocks the valuable information contained in those audio files. Trends can not only be identified, but theories can be validated by searching audio for significant words or phrases.

Productivity-Enhancing Technology

SERTAINTY processes audio into a time-encoded stream of probable phonemes and then executes a set of rules against the processed audio and data associated with the call. Unlike other methods of searching audio content, such as speech-to-text, phonetic searching is faster, more accurate, and less expensive. Phonetic searching is also significantly more flexible due to its open vocabulary and ability to recognize phonetic and inexact spellings (e.g., "Smith", "Smithe", "Smyth", or "Smythe").

By processing the audio into a phonetic representation, the audio is viewed as data that can be searched very quickly for selected words or phrases. Additionally, SERTAINTY can dynamically associate sets of rules with a call based on unique customer information. This allows contact center managers to review calls based upon attributes associated with the contact, the agent, or the campaign. For example, different levels of review can be applied for novice agents versus experienced agents, or high-value customers versus unknown callers.

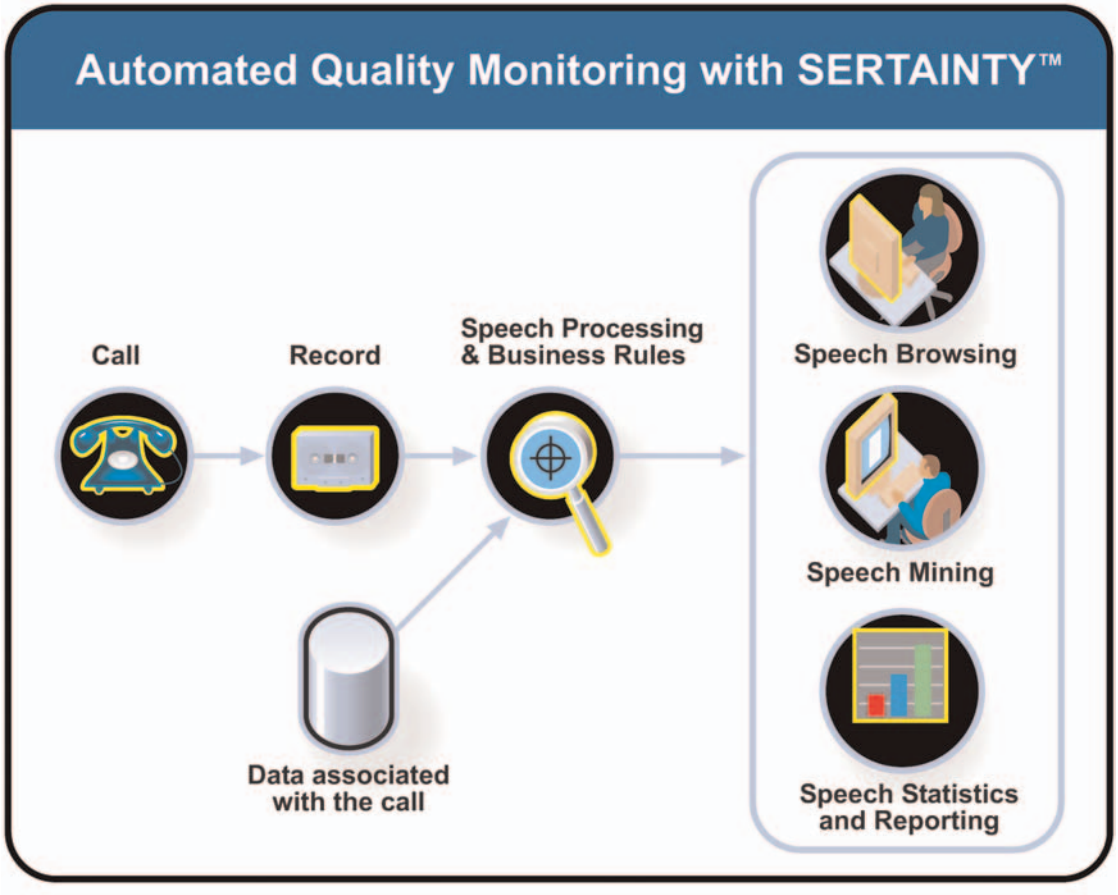

Figure 3
SERTAINTY integrates business knowledge with speech data to deliver a new source for measuring and managing agents.

Rules created in SERTAINTY can best be thought of as KPIs - for example, use of a proper greeting, a permission to record request, adherence to one or more sections of the script, etc. For each KPI, SERTAINTY issues alerts which can be viewed in the Call Reviewer. Alerts are used to draw attention to an area of the call where a KPI has not been achieved during the call. Typically, KPIs are triggered by a word or phrase of interest, either positive (found) or negative (missing). Selecting an alert within the Call Reviewer positions the playback to the exact location in the call where the word or phrase was detected or expected. Additionally, for each KPI, SERTAINTY collects call statistics so that supervisors can measure them using reports.

A set of KPIs that are bundled together define a Quality Profile. One or more Quality Profiles can be administered within SERTAINTY and associated with a single call - enabling you to have separate Quality Profiles to monitor calls for script adherence, use of profanity, rude conduct, etc.

Process Flow

SERTAINTY operates independent of the audio source and can be easily integrated with most commercially available recording platforms. Uncompressed telephony data is 64kb, 8 bit PCM data sampled at an 8 KHz rate. Recording platforms typically compress the data, so there must be an available CODEC to translate the audio into a suitable format for the speech engine.

Software processes within SERTAINTY work in concert to process audio for monitoring. All communication among the various processes that comprise the system is performed using XML over sockets. One of the processes in SERTAINTY abstracts the details of the audio source. That process interfaces with the device collecting the audio and receives events along with any data the recording device may associate with the call when new audio is available. An internal notification is subsequently sent to SERTAINTY's business rules engine.

The business rules engine determines whether a call should be processed based upon the information known about the call, such as ANI/CLID or DNIS. For instance, a direct-dial call may not be selected for analysis, while an ACD call is. Should the business rules engine determine that the call is subject to further analysis, the call is queued for speech processing, where the phonetic representation is created.

After the phonetic representation is created, one or more Quality Profiles are executed against the audio segment. Because a single call may enter the system as a series of audio segments, separate Quality Profiles can be executed for each audio segment. A Quality Profile can also be executed over all the segments when the call completes.

Speech Processing & Rules

SERTAINTY leverages speech recognition technology to extract key words and phrases from agent calls. The speech recognition technology uses a unique algorithm for parsing and indexing phonetic patterns in speech. Its phonetic-based search capabilities are speaker-independent - accents, dialects, and slang can be processed without affecting the accuracy or speed of the search. Additionally, phonetic indexing accommodates an open vocabulary system that supports any search term including specialized terminology or names of people, places, and organizations.

SERTAINTY's business rules engine is built around the Visual Basic for Applications (VBA) language. VBA provides significant flexibility and functionality for power users. SERTAINTY's Enterprise Rules Manager is provided to allow even users inexperienced with VBA to create KPIs and Quality Profiles.

Within the rules engine, all of the capabilities of VBA are available. Additionally, within SERTAINTY, VBA has been extended to provide an object used to support audio searching. This object has several properties, subroutines, and functions to search the processed audio. Two key functions used to search the audio are "Said" and "Search". Said is a Boolean function that searches the audio for a phrase at or above a given confidence level. Search is a function that returns a SpeechResults object, which is a collection of search results. Each item in the collection contains the phrase, the confidence at which it was found, and the offset within the audio at which it was found. Properties of the object can be manipulated to allow finer control of the audio search.

While the search function within the speech engine searches for a single phrase, it is clear that real-world business rules are often predicated on more than a simple search. SERTAINTY uses Search Grammar Notation (SGN), which permits search phrases to be made up of simple, compound, or permuted expressions:

- *Simple search expression* - a simple phrase (e.g., "Speak with your manager").
- *Compound search expression* - a search string composed of more than one expression combined in sequence.
- *Permuted search expression* - a sequence of search phrases that must be found within a given time period. The search criterion includes an elapsed time between every set of phrases in the sequence.

Real-World Use

In the contact center environment, contact sequences are often scripted. There exists an inherent and consistent relationship between spoken phrases and exchanges. Specifically, one phrase follows another within a given time frame. If this normal timing is not present, it may indicate an abnormal call.

SERTAINTY enables monitors to create more complex and meaningful queries, for instance:

> *"Thank you for calling Joe's Bank, my name is" + (name of agent who handled call) + "How may I help you"*
>
> or…
>
> *"May I record this conversation?" followed within 2 seconds by "yes" or its derivatives.*

When calls are scripted, the statistical distribution of the time between adjacent phrases can be determined by analyzing a set of sample calls. Once the distribution is known, the determination of a confidence level for a KPI can be based on a combination of the results returned from the speech engine and the distance, or time span, of the phrase from an associated phrase.

In addition to the real-time application of rules, SERTAINTY's batch processing mode can be used to run rules against archived audio files. Similarly, SERTAINTY can be used as an audio mining tool. Calls that have been previously processed by the speech engine can be searched at very high rates. Audio mining combines speech and traditional SQL to allow users to form queries.

For instance:

> *"Find all calls handled by agent 'jima', occurred on July 12th, lasted longer than 4 minutes, resulted in a sale over $100, and contained the phrase 'free shipping'"*

This combination of powerful rules and speech processing enables contact centers to take quality monitoring to the next level.

Scalability

SERTAINTY is a scalable system that is distributed across multiple servers. SERTAINTY is constructed with client/server architecture and is designed to snap into any modern contact center infrastructure. Each standard Intel® processor is capable of processing up to 480 minutes of audio per hour and each system is scalable in a manner that offers a catch up or keep up strategy to fit a given center's needs. Specifically, the system can be configured to ensure there are enough processors to keep up with the peak load, in which case the queue length will never exceed one. Alternatively, SERTAINTY can be configured to keep up with the average load. Using this approach means that during peak periods, the queue of work will continue to build. Items in queue will be serviced during the lower volume hours.

By example, assuming a normal population of 100 active seats in a center, where the average talk time/record time per agent is 40 minutes and the center is open 12 hours a day, 6 days a week, 100 agents X 40 minutes per hour talk time = 4,000 minutes per hour to be processed. To effectively keep up with audio as it becomes available and process 100% of all conversations, approximately 8 processors would be required. By comparison, a modest five percent (5%) sampling, of which 85% of the random sample will be scored as OK, the same center would require as many as 6 human beings. However, if the conversations were monitored by SERTAINTY, 100% of the calls could be monitored and only the calls identified, as "out of the norm" would be monitored by humans.

Summary

SERTAINTY provides the automated monitoring capabilities contact centers require to listen to 100% of their calls and the ability to analyze every customer interaction while reducing both the time and people it takes to get the job done. Benefits include:

- *Reduces operating costs by minimizing the need to manually monitor agent activities*
- *Enables supervisors to monitor more calls with fewer resources*
- *Seamlessly integrates with existing contact center call recording products*
- *Monitors all calls and identifies only those that require supervisor attention*
- *Increases call quality by ensuring KPIs are being met*

SERTAINTY combines advanced speech recognition technology and a robust rules engine to convert spoken words into retrievable data, making it possible for managers to monitor agent activities in near real time. As SERTAINTY analyzes a call, the system flags only those calls that actually need to be reviewed by a supervisor. Based on user-defined KPIs, for example, supervisors can configure SERTAINTY to flag only those calls in which inappropriate language is used by an agent or customer.

SERTAINTY's underlying audio processing and search technology does not rely upon a predetermined word recognition dictionary. As a result, recorded conversations can be stored and subsequently audited or searched for any combination of sounds (words), or lack thereof, and can be combined with traditional data forms in an SQL-like query. Essentially, SERTAINTY processes audio once and then, like other stored data, the output can be searched over and over again. Audio processing occurs at approximately 8 times faster than real time (e.g., 60 minutes of audio can be processed in 7.5 minutes) and subsequent searches can be performed at speeds as great as 100,000 times faster than real time. The time saved and hardware costs associated with this technology offer a significant differentiator over any other competitive product.

SERTAINTY reduces contact center operating costs by minimizing the need to manually monitor agent activities while increasing call quality by ensuring that KPIs are being met. Simply put, contact center operators can monitor more calls in less time using fewer resources. As an added benefit, SERTAINTY can help reduce attrition by enabling supervisors to spend more time coaching and developing agent skills. The net result is the ability to turn average agents into top performers. Additionally, with SERTAINTY's audio mining capabilities, contact centers have an opportunity to provide new, value added services to their customers.

SERTAINTY integrates with existing contact center call recording products and is customizable to meet user needs. The product is also highly scalable and can be distributed across multiple servers. In addition, SERTAINTY can be customized to address the specific monitoring needs and standards of each individual contact center.

Glossary

ACD	Short for Automatic Call Distributor; a device that distributes incoming calls to a specific group of terminals.
ANI/CLID	Short for Automatic Number Identification or caller ID; a service that tells the recipient of a telephone call the telephone number of the person making the call.
Boolean	Having exactly two possible values, true or false.
CODEC	Short for coder/decoder; an integrated circuit or other electronic device combining the circuits needed to convert digital signals to and from analog (Pulse Code Modulation) form.
DNIS	Short for Dialed Number Identification Service; a telephone service that identifies, for the receiver of a call, the number that the caller dialed. A common feature of 800 and 900 lines.
KPI	Short for Key Performance Indicator; a business rule associated with a call to measure the quality of the call.
Object	A self-contained entity that consists of both data and procedures to manipulate the data.
PCM	Short for Pulse Code Modulation; a method by which an audio signal is represented as digital data.
Phoneme	The smallest unit of speech that differentiates one utterance from another in any spoken language or dialect.
Phonetic	Pertaining to spoken language or speech sounds and based on the principle division of speech sounds into phonemes. Or, a self-contained entity that consists of both data and procedures to manipulate the data.
VBA	Short for Visual Basic for Applications; developed by Microsoft®, a program that operates on objects representing the application and the entities it manipulates.
XML	Short for Extensible Markup Language; a programming language designed especially for Web documents. It allows designers to create their own customized tags, enabling the definition, transmission, validation, and interpretation of data between applications and between organizations.

Other Productivity-Enhancing Solutions from SER:

SERTIFY™ - Truly automated call validation using state-of-the-art speech recognition technology.

Call Processing System™ (CPS) - The most proven and cost-effective call management system in the market today.

TSP500™ - Breakthrough predictive dialing switch that scales to 288 agents and provides fully integrated VoIP capabilities.

CPS for Collections™ - Combines superior predictive dialing with sophisticated inbound and call blending features to meet the specific needs of Collection Agencies.

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