



STREAMING ANALYTICS TURNS CALL CENTERS INTO REAL-TIME OPERATIONS

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Chapter 1: Call Centers Step into the Analytics Stream

Today's consumers demand experiences that are both instantaneous and personalized. To provide that level of service, call centers and customer service representatives (CSRs) must be able to quickly respond with information about the customer in question. Organizations have been collecting and storing relevant data about their customers for years, but many perform analysis only after a call. Though that approach has benefits, including improved agent training and websites, the optimal approach is to perform the analysis while the rep is interacting with the customer.

Add to that an increasing reliance on mobile and web applications that can serve every need. Why would consumers bother with a phone call when they can self-serve themselves out of dozens of common problems with their troublesome product or service? The threat of higher volumes, longer waits, and more unsatisfied customers looms, but smart organizations are getting ready for a big move into real-time analytics.

This technology is making call centers relevant again.

In the past, organizations relied almost exclusively on collecting vast quantities of data about their customers, often in aggregate, to gather actionable insights. For example, a call center might combine information about the nature of their customers' calls, which would allow them to understand not only which problems are the most common, but also which take the most time to resolve, along with which resolutions produce the highest (or lowest) customer satisfaction.

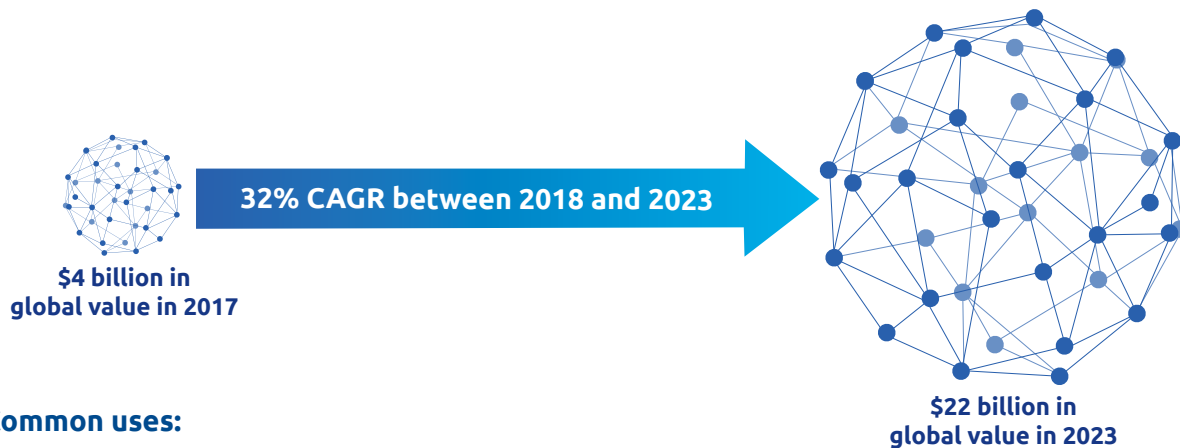
These days, batch analytics systems include highly sophisticated and computationally intensive artificial intelligence (AI) and machine learning (ML) algorithms. These insights are often critical to an organization's efforts to become more efficient and effective, but they don't help a given customer during his or her interaction—they help only after the fact. Call center organizations have always desired ways to assist their customers in real time, but the technology needed to enable that had been inaccessible.

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Enter **streaming analytics**, which allows organizations to ingest and process audio data during an ongoing call. The ability to perform speech-to-text conversion in real time creates new opportunities to correlate the call's context with an omnichannel view of the customer or apply AI/ML models in a matter of seconds.

Let's say a customer calls because she's having trouble updating her smartphone's operating system. The speech-to-text conversion capability recognizes a few key words, such as "iPhone" and "update," and immediately sends the CSR information about upgrade procedures and troubleshooting. The speech data is also correlated with the customer's account, which notifies the CSR that the customer is qualified for an upgraded phone. This empowers the rep to not only help the customer with her current issue, but also upsell her on a new smartphone with the update preinstalled.

Streaming Analytics at a Glance



Common uses:

-  Ingestion of real-time social media sentiment
-  Preventative maintenance on mission-critical equipment
-  Analysis of a website visitor's pathway to conversion or checkout
-  Cybersecurity detection and prevention

Source: [Global Streaming Analytics Market – Growth, Trend and Forecasts \(2018 - 2023\)](#), Research and Markets, July 2018

Streaming analytics separates itself from batch analytics by time—namely, a focus on real-time and instantaneous results. A combination of new technologies, faster computers, and more sophisticated data science has enabled this new generation of streaming analytics. More sophisticated data lakes allow organizations to not only store more data than ever before, but also to enable them to ingest, cleanse, prepare, and govern both structured and unstructured data on easy-to-use cloud platforms. Quicker networks enable decentralized and non-siloed data storage frameworks, and streaming analytics shortens the time gap between the collection of raw data and the delivery of insights.

In the past, organizations would need to invest in substantial infrastructure to access the power of streaming analytics. Now that more analytics providers are offering streaming analytics in a Software-as-a-Service (SaaS) model, organizations can pay by the hour or by the month to ingest their data and gain actionable insights in real time.

Modern call centers are enormously complex organizations, given the sheer number of employees, the volume of calls handled daily, and a constant drive to offer better service in less time. Call centers without streaming analytics capabilities struggle primarily with sentiment, complexity, and cost, which we'll cover in the following chapter. Even organizations that have implemented the technology are looking for more practical insights that can be cross-referenced against other information they have about a given customer.

With streaming analytics, organizations are beginning to ask: What if? What if we could analyze customer sentiment in real time based on speech-to-text analysis? What if we could calculate the lifetime value of our customers? What if we could improve customer satisfaction, while also increasing the productivity and morale of our employees? In the past, these opportunities might have been impossible, but this is the empowered era of streaming analytics.

Chapter 2: Building the ‘Switchboard’ to a Streaming-Enabled Call Center

When a customer dials a company’s support line, the experience with that vendor’s product is already less than ideal. A call center’s primary purpose is to mitigate that poor experience, offer a resolution, and turn frustration into satisfaction. The last thing the customer wants to do is explain the problem in great detail, but that’s precisely what a CSR needs to hear to figure out the problem and offer a solution.

Call centers are forced into a defensive mode from the moment a call begins, which is the first of many hurdles they need to clear. Without improvements in tooling and technology for call centers and their employees, organizations continue to struggle with **sentiment**, **complexity**, and **cost**.



The Present: Batch Only and Siloed

The most challenging job a CSR faces—dozens of times per shift—is to be able to understand the customer’s **sentiment** over the phone. Every CSR wants customers to end their call feeling satisfied with the solution rather than annoyed or frustrated, but determining how to achieve that outcome is often left to guesswork.

However, call centers can’t eliminate **complexity** and optimize their processes effectively if they don’t know how customers are feeling during any given moment of the experience—especially given that today’s consumers demand a “one-stop-shop” experience for resolving their problems.

The inability to understand sentiment and reduce complexity adds cost to each call. Every minute of interaction is an expense, as is every hand-off between CSRs on different support tiers. When employees can’t increase their productivity while handling calls and other duties, call center organizations are forced to spend more on payroll. When morale drops, HR must spend more on onboarding, while also dealing with high turnover rates.

All this adds up to an unsustainable, consumer-unfriendly business model.

One critical issue is that a call center’s streaming analytics needs are different from most of an organization’s other uses for streaming: A call center needs to process voice, text, and video; engage in social media sentiment analysis; and more—all in real time. Call centers have access to a plethora of data about customers, but they often can’t access it fast enough or correlate it with other critical information.

Pain Points of a Call Center

For call centers to perform at their best, they need these capabilities:



Scalability to withstand enormous, unexpected volumes of calls



Instant response times to ensure customers receive potential solutions as quickly as possible



Low latency to move customers from problem to solution with little friction and without requiring hand-offs to other agents or support tiers



Speech-to-text technology to ensure that ongoing calls can be analyzed during the duration of the call, not after the fact



AI/cognitive capabilities that give call center operators the ability to understand sentiment and context in real time



An omnichannel view of the customer that enables CSRs to understand not only the current issue, but also the consumer's entire experience with the organization as a whole

The Future: Real-Time and Comprehensive Operations

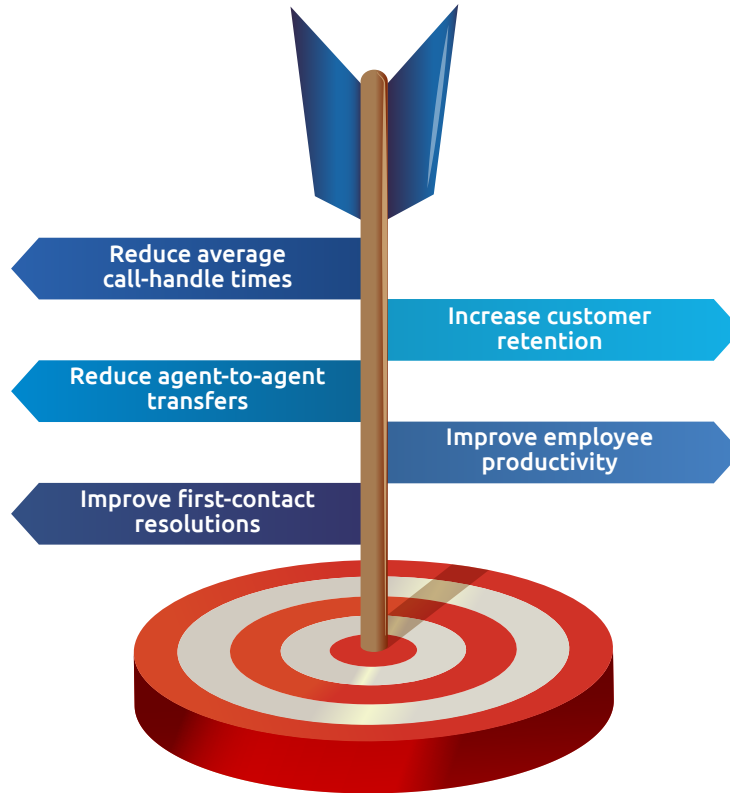
A streaming-enabled call center presents a very different picture. A customer's first choice is often to try out the self-service options, which are more effective due to analytics-based optimizations from the streaming service. If the customer still needs to contact the call center for personalized help, the CSR can answer the call with existing context regarding the problem.

As the call continues, the streaming analytics platform can update the representative with new insights by correlating the context of the request with other relevant information from the account, such as the customer's last purchase, previous service requests, key demographics, and other data. A cognitive assistant personalizes these options for a given customer and offers them to the CSR.

The CSR can see an analysis of the customer's sentiment at any given moment, helping to guide both the advice they offer and how they offer it.

But streaming analytics in the call center involves more than performing speech-to-text and analyzing the ongoing conversation. Streaming enables call centers to identify repeat callers and categorize calls in real time, which also creates the ability to recognize patterns, such as where many customers are calling from or the topics many of them are interested in. An increase in calls from a specific region could signal a localized service outage, for example, which can effectively guide the CSR's dialogue.

The Many Goals of an Optimized Call Center



Chapter 3: Streaming Empowers Telecom Provider's High-Volume Call Centers

A major mobile telecom provider with over 100 million customers (including millions of internet customers and TV subscribers) inevitably needs to deal with an immense volume of customer service calls. In recent years, the company's top personnel identified many opportunities to reduce complexity, understand sentiment, and reduce costs—but only if they could visualize the entire customer journey and receive insights in real time.

The telecom provider wanted a call center experience that was cognitive, real time, and in context, with the end goal of raising first-call resolution rates by giving CSRs better tools and new insights into the customer's journey.

"We need to better understand our customers every step of the way. ... To provide a personalized experience, you need to understand the customer journey, the customer intent, and gather the insights of the customer. Your system should be intelligent, continuous learning, and get smarter over time by understanding and correlating customer interactions."

*— Vice President of IT,
Major Mobile Telecom Provider*

A Closer Look: IBM® Streaming System in Action

Imagine a scenario in which a customer has just purchased a smartphone, brought it home, spent time configuring and customizing all the backgrounds and apps, only to discover that the email doesn't work. The moment of first fault is where the customer service experience begins: Any optimization that makes this process faster and friendlier for the customer saves money, improves engagement, and reduces the risk of churn.

This telecom provider's new streaming system begins during the call. Sophisticated natural-language processing capabilities on streaming data—for example, search queries for phrases such as, "I've just bought a cell phone and my email isn't working"—allow the self-service system to recognize key words and deliver the most popular and effective solutions. Intelligent recommendations can mitigate specific problems, but the company understands that it also needs more effective call center operations.

If the customer does need to phone customer service, call audio is transferred, in real time, into the streaming analytics system as soon as the customer service representative picks up. IBM Streams performs speech-to-text analysis on that audio and correlates key phrases and overall sentiment with existing customer data to provide full context. This information is handed to the CSR immediately so he or she can react instantly and make appropriate recommendations. The system is even capable of delivering a "curated" solution for the CSR to recommend.

For example, let's say the customer says he's having an issue with the email on his new iPhone, but doesn't specify which model. The Streams system would correlate the term "iPhone" with the customer's existing profile, which notes that he recently purchased an iPhone X. Because support suggestions might differ from one model to the next, improving call center tooling enables the CSR to drive toward a solution in less time and with less hassle for the customer.

Streams: More than Expected

The telecom provider's primary purpose in implementing a streaming analytics solution was to reduce first-call resolution rates, but it found that Streams' capabilities were even more powerful than expected. The company's engineers have been able to write additional applications to solve ongoing problems and continue a pattern of improvement with call center operations.

Many of these newly built applications have incorporated IBM's Watson technology for additional cognitive workloads. The no-coding environment and open-source data science tools make the development of these applications easier than any in-house solution, and Watson's AI capabilities can even be used to predict future trends based on the current state of streaming data.

"Customers' needs and preferences are rapidly evolving. Customers expect a simple, personal, and reliable experience through every interaction—whenever, wherever, however they choose to interact with us."

*— Vice President of IT,
Major Mobile Telecom Provider*

The business value for the company and its call centers:



Improved **first-call resolution** rates



Better **call deflection**, whereby the company reduces the volume of calls to the call center by offering richer, more personalized self-service support options



Decreased **average call-handle times**



A reduction in **agent-to-agent transfers** to create consistency and reduce labor costs



Data is merged from previously siloed data repositories



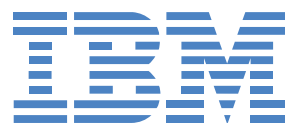
Customers spend less time in an **interactive voice response (IVR) system**



In-depth contextual information **improves revenue** through cross-sell and upsell opportunities

Delivering instantaneous and personalized experiences is no easy task, but using streaming analytics as a foundation for smarter customer-centric analytics is ideal place to start. By providing the answers customers demand on a platform that works for them—with minimal time and effort—call center organizations can empower their CSRs with potent tools to improve the customer experience, enhance employee productivity, and significantly increase customer retention and company revenue.

For more information on IBM Streams, visit <https://www.ibm.com/cloud/streaming-analytics>



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IBM Streams analyzes the broadest range of streaming data, making decisions while events are happening. It brings meaning to fast-moving data streams and helps organizations in a wide variety of industries. Now organizations can subscribe to device data to provide advanced analytics using Streams with IoT platform capabilities.

A key component of the IBM Cloud Platform, Streams offers a computing platform that helps organizations turn burgeoning, fast-moving volumes and varieties of data into insight. It delivers a programming language and an integrated development environment (IDE) for applications, a runtime system that executes the applications on a single host or a distributed set of hosts, and analytic toolkits to help speed development. You can use Java and Python to develop applications for deployment to the runtime. Streams can ingest, filter, analyze, and correlate massive volumes of continuous data streams.

These data streams can originate from any of the following:

- IoT devices and sensors.
- Text files, spreadsheets, images, video, and audio recordings.
- Email, chat, and instant messaging; web traffic, blogs, and social networking sites.
- Financial transactions, customer service records, telephone usage records, and system and application logs.
- Satellite data, GPS data, smart devices, sensors, network traffic, and messages.