

# Goodbye to CTI, Hello to Unified

The Evolution Continues

## Executive Summary

Contact center technology is ever evolving to meet the rapidly changing demands of consumers and businesses. Computer telephony integration (CTI) – once touted as state-of-the-art for managing customer interactions, is the latest technology facing retirement. It has become an outdated technology that is actually hindering contact centers from satisfying customers. And, it's time to say goodbye to CTI.

CTI is limiting the control, choice, and flexibility that contact centers could be experiencing. It creates numerous business challenges for companies – in particular, the IT department – requiring a heavy investment of time, money, and resources to integrate applications from multiple, siloed products to make it useful to the business. To be sure, CTI has delivered some productivity gains, but at a steep cost. CTI's benefits have been limited to the narrow market segment of large enterprises that have the money and development staff to handle complex software integration projects, both initially and ongoing, because of the costly change management that comes with frequent technology updates for individual point solutions. Happily, as CTI runs its course, a better solution has emerged.

Unified architectures are making CTI obsolete. By uniting multiple capabilities – including automatic call distribution (ACD), predictive dialing, speech self service, Internet contact via email or chat, recording, and logging and quality management, all with unified reporting, routing and administration – in a single platform, unified solutions give contact centers the necessary control, flexibility, and freedom to focus on cost-effectively meeting today's consumer's demands.

## Introduction

No two contact centers are exactly alike, but they all have one thing in common: They all need flexibility and agility to respond to rapidly changing customer demands and market shifts, always with an eye toward the bottom line. Communications and contact center technologies have advanced over the years to help contact centers better serve customer needs and control costs. Three basic technology architectures have emerged in this ongoing evolution.

- 1970s – Standalone products, such as automatic call distributors (ACD), interactive voice response (IVR), and predictive dialers
- 1980s and 1990s – Computer telephony integration (CTI)
- 2000s – Unified solutions architected around standards-based Internet Protocol (IP) telephony

**What Is CTI?**

*Computer telephony integration, or simply "computer telephony," is the use of computers to manage telephone calls in contact centers, such as those that direct phone calls to the right department in a business. CTI applications can provide:*

- *Integration of systems with backend applications and databases.*
- *Telephony control between third party solutions.*
- *Call routing, reporting functions, automation of desktop activities, and multi-channel blending of phone, e-mail, and web requests.*
- *Agent state control (for example, after-call work for a set duration, then automatic change to the ready state).*

*The origins of CTI can be found in simple Screen Population (or "Screen Pop") and Data Directed Routing technology. This would enable data from the telephone systems to be used to query databases with customer information and populate that data instantaneously on the contact center agent's screen. The net effect is the agent already has the required information before speaking with the customer.*

The evolution of these technologies can be tied to the overall changes that have been taking place in the contact center throughout the last 30 years. Contact centers are being asked to address a myriad of customer interactions that are increasingly more strategic to the business. Likewise, contact center technologies have evolved in response.

Forward-looking IT managers are demanding contact center technologies and architectures that are in lock step with long-term business strategies. Frost & Sullivan research<sup>1</sup> cites a "growing need for single, unified contact center solutions," as enterprises of all sizes are rapidly shifting toward a holistic view of their customer contact operations. This paper will explore what these next-generation unified solutions look like. But first, let's review what CTI promised – and what it delivered.

**CTI – A Promise Never Completely Fulfilled**

The first CTI products were developed in the late 1980s, and the market began to grasp and implement CTI concepts in the early 1990s. A new industry was born, as a flurry of CTI companies were launched, and trade shows and magazines were founded under the CTI banner.

At first, the much-vaunted promise of this technology was to integrate the hodgepodge of technologies that had been introduced in rapid succession to contact centers, from the telephone to ACD, IVR, dialer, fax, call recording systems, and voicemail systems, to name a few. These disparate systems, typically provided by multiple vendors, created a major operational challenge for the IT organization.

In addition, CTI promised to correlate the caller on the phone system with the customer data in the company's databases to empower agents with information about the customer. CTI systems interfaced with both the telephony network and customer data network to provide a "Screen Pop" to the agent when an inbound call arrived from the ACD or an outbound call dialed by the predictive dialer is about to be connected to the agent. CTI "middleware" systems connected with the ACDs, dialers, messaging systems and customer databases to allow data to be shared among these applications.

To be sure, when CTI worked, cost savings could be achieved, however CTI implementations had a number of shortcomings brought on by their own complexity. For example, they were often difficult and expensive to implement and ultimately never solved the underlying business challenge that has plagued contact centers since their inception – how to deliver a consistent level of service to customers across all interactions in a cost-effective manner.

Instead, CTI opened a Pandora's Box of technology challenges:

- Multiple points of integration. Every system, every application, every device on the network is an integration point that carries its own risks and operational challenges, creating multiple points of potential failure.
- Multiple places of administration. Contact center administrators have to manually manage business rules and configuration data among multiple systems and keep them in sync.

- Technology updates and incompatibilities. IT departments face the ongoing challenge of keeping the contact center operational whenever a new version of a technology is implemented. One update can create new incompatibilities with many other technologies.
- Performance issues. As calls go through the various CTI overhead processes, the speed of overall call processing and operations can be negatively impacted.

Rather than solving the problem of uniting disparate technologies, CTI itself adds yet another application to the contact center mix and does not reduce the total number of technologies. Instead, IT managers are tasked with additional administrative overhead, including keeping track of various versions of CTI links. Instead of unifying and simplifying, CTI has become a resource drain – expensive to deploy and costly to integrate, both up front and on ongoing basis.

### **Technology Challenges of CTI**

An integrated contact center is a complex contact center. With various systems linked together in one way or another, essential operational activities and troubleshooting become unnecessarily difficult. Specifically this impacts three key areas: Routing, reporting and administration.

#### ***Routing Challenges***

Because each contact center application executes its own business rules, there is no way for CTI to ensure that a customer is managed consistently across all interactions. ACDs, dialers and IVRs each have their own business rules, which requires that each time there is an agent change, such as adding skills sets, each of the routing rules would need to be updated in the individual applications. The chance of errors is high, as changes to one system create unanticipated impacts to other systems, and products have to be re-integrated with the rest of the center. This lengthens the time it takes to go live new contact center applications and the risk of errors and downtime increases the potential for consumer dissatisfaction.

In addition, implementing and acting on business rules related to routing, workflow, agent skills, and prioritization is quite tricky in an integrated contact center. Maintaining the same set of business rules across systems is burdensome, and, with tens or hundreds of changes to routing rules and staff properties (e.g., groups, job status, permissions) on a daily basis, this can quickly prove to be impossible. Unfortunately, customer satisfaction with these contact centers suffers a great deal because they don't receive a consistent experience across interactions or channels. This breeds frustration that ultimately leads to churn, and worse, brand erosion.

#### ***Reporting Challenges***

Accurate, comprehensive reporting across the enterprise is essential for managing a successful contact center operation. Supervisors and managers need real-time and historical reports to understand the status of queues, campaigns, and agents in order to make educated staffing and routing decisions, and to assess and manage productivity. Point solutions each have their own reporting systems and require contact center management to manually compile the data or spend the integration dollars to consolidate the data into a single reporting environment. CTI has been touted as a way to solve this challenge, however it has not delivered, mainly due to the complexity of combining data elements from distinct systems that often use differing terminology and metrics.

For the IT manager, trying to consolidate this information from disparate systems with differing views is difficult and time-consuming, and often yields only incomplete information. Frustratingly, even at best, CTI reporting is weak because of the need to “normalize” the data from the underlying applications. In truth, “normalizing” the underlying application is another way of saying “dumbing them down” and in the process contact centers lose the intelligence to make decisions.

### **Administration Challenges**

CTI architectures require multiple ways of doing things – multiple logins, multiple user interfaces for administrators, each with a different look and feel – constantly requiring translation between systems to execute fundamental business rules. It also requires that agents would need to potentially be configured in different systems multiple times. For the business, this administrative nightmare makes it difficult to grow and scale the contact center operation – let alone create virtual contact centers across multiple sites or leverage remote and at home workers. For example, if a new agent is hired within the contact center, their information has to be configured in the ACD, quality management system, dialer and CTI environment separately. When you consider the level of moves, adds, and changes (MAC) that occur in contact center environments, it is clear that operating siloed solutions and CTI environments is onerous on the contact center administrators.

### ***Tallying the Cost of CTI***

The cost of integration, in both hours and dollars, can be exorbitant. To get all the pieces to work together, each vendor must be involved in the integration effort, which usually requires some level of customization. In most cases, the integration cost is well above and beyond the cost of the product licenses, and as new versions of these products are released and deployed, all of the components must be reintegrated all over again. What's more, compiling and interpreting reports from various systems in an integrated center often requires several full-time employees.

Plus, multiple points of integration equal multiple points of failure. If a contact center is experiencing a system issue or worse, downtime, it can be nearly impossible to pinpoint the root cause in an environment where there are a myriad of systems integrated together. This can take up a lot of time and resources to identify where the probably is occurring.

Add to this the expense of professional services, the multiple hardware platforms - all requiring separate maintenance contracts, as well as installation and integration services and the end result could be a system costing up to 70 percent more than if a contact center went the unified route.

All of this begs the question: Are CTI systems on life support – or worse? "CTI is a dying category," says Sheila McGee-Smith, president and principal analyst of McGee-Smith Analytics.<sup>2</sup> While software-based architectures, powered by session-initiation protocol (SIP) and voice over IP (VoIP), are playing a role in supplanting CTI, web services is making the biggest impact by creating software applications that are easier to afford, manage, and troubleshoot.

### **There is a Better Way – Unified**

What does unified mean? By uniting multiple capabilities – including automatic call distribution (ACD), predictive dialing, speech self service, Internet contact via email or chat, recording, and logging and quality management, all with unified reporting, routing, and administration – in a single platform, contact centers have complete administrative and operational control and can escape the costs and headaches of integration.

For new and existing contact centers alike, the benefits of implementing a unified solution are real, measurable and tangible. First and foremost, the time spent on integration is virtually eliminated. Because a unified solution can work with existing infrastructures, contact centers can migrate from an integrated environment to a unified one without losing previously made investments in other systems. There is no "rip and replace" required. As certain technologies become end of life, or the capabilities of existing applications no longer meet strategic objectives, a contact center can begin to implement a unified solution by adding licenses for specific functionality as it is needed.

A unified approach also eliminates the endless version control issues normally present with multiple systems, reducing the amount of staff time needed to manage those version updates. And, because it's considerably easier to troubleshoot issues in a unified environment, it doesn't require hours to identify which system is causing the problem, resulting in even more cost savings.

#### ***How It Works***

The latest Unified solutions are based on a distributed, n-tier, web services architecture. The switching (or contact acquisition), call control (or routing), load balancing, and transaction processing are managed by distinct software processes. These software processes can be loaded onto a single physical server - delivering, in essence, an all-in-one solution, or distributed across multiple servers for added scalability, performance, and enhanced reliability. And, by incorporating web services technology into the architecture, it exposes open interfaces for linking the unified contact center system with key customer relationship management (CRM) and back office applications in the enterprise, bringing even greater value to the contact center.

Designed from the onset to handle multiple modes of interaction, unified solutions inherently share data across the system; there is no need for the complexity of computer-to-telephony integration. Unified applications means unified management, administration, and reporting.

A unified solution provides managers with a comprehensive perspective of contact center and agent performance. It allows centers to generate enterprise reports across all applications that reveal service and campaign performance via inbound and outbound calls, chat sessions, and email communications; workflow and agent performance statistics; and operational metrics. All communication channels use a central repository for reporting, meaning that information about agents, queues, resolution status, and other key metrics is automatically consolidated across every communication channel, enabling supervisors to best understand what takes place in their contact center so they can make the best choices for the business.

Unified solutions eliminate the need to normalize and consolidate information from multiple channels and sites, while delivering an enterprise-level view of the operation. As a result, accurate and comprehensive reporting allows managers to know the status of queues, agents, campaigns, etc., and to ensure consistent service for the customer across all contact methods - phone, email, or online chat. With this added information, the company is able to see if it is meeting or exceeding customer service levels, while bringing consistency and best practices to all contact center reporting needs. Contact center managers can "compare apples to apples," because all of the data is from the same application.

Unified business rules enable consistency across multiple services. With CTI, maintaining accurate business rules between disparate systems is cumbersome, with hundreds of changes daily to staff properties and routing rules, but unified solutions addresses this problem by bringing together all of the applications into a single point of administration which eliminates the need for multiple administration screens that would be required by point solutions. In addition, unified solutions remove the headache of managing multiple vendors, or even having to figure out which one to call. It's the simplicity of having "one throat to choke."

***A Day in the Life of a Unified Contact Center***

The following scenarios help illustrate how unified contact centers can positively impact consumers, agents, supervisors and IT managers alike.

- A consumer contacts her bank to check on the balance in her checking account. The unified contact center's voice portal receives the call and immediately identifies the caller as a Tier 1 customer, with more than \$100,000 in her portfolio with the bank. The balance is provided via a speech-enabled self-service application, and the consumer is presented with the option to take advantage of the bank's new high-yield savings account for preferred customers. If the consumer is interested, she is automatically connected with a Tier 1 customer specialist, who has immediate access to information about the caller, her portfolio details, and the special packages available to her. A unified solution makes all of this possible and turns a simple call into a new business opportunity.
- A customer service agent has been responding to inbound calls throughout the morning. Accustomed to working in a typical point solution environment, he anticipates some idle time as 10:30a.m. approaches, since inbound call volume normally slows down mid-morning and does not pick up again until noon. This tedious routine has been a source of increasing job dissatisfaction, since agents are compensated based on the number of customer issues resolved. Now, with the unified solution in place, the agent can provide proactive customer care support for calls made via an automatic predictive dialer, as well as handling Web chat and email inquiries through the blended capabilities. This relieves the monotony of the job, and the increased interactions lead them to be more productive, better compensated, and more loyal.
- A supervisor in a unified contact center has real-time access to agent activities and performance in the contact center across all interactions and is empowered to take action, (throughout the day, if necessary) to ensure that the overall operational goals of the business are met. She can deploy agent resources wherever the greatest need arises during the day and have access to tools as part of the unified solution, such as quality management, that enable her to monitor and coach agents to improve the overall productivity of the contact center.
- The IT manager finds that his life is greatly simplified now that the unified contact center has been put in place. There are no more overnight shifts to keep the CTI integrations current, no more long hours of troubleshooting - and finger pointing - to identify which vendor's product is responsible for the problem, and no three-week projects to coordinate with five vendors when an IP address needs to be changed in the data center. All of these pains are eliminated by having one comprehensive solution that eliminates the myriad of integrations that CTI requires, while providing the full monitoring, alerting, and notification capabilities that IT needs. And, the cost savings are allowing him to spend his resources on technology investments that are strategic to the business.

***The Evolution Continues***

Unified solutions represent the next generation of technology for the contact center, and can transform it into a strategic asset for the enterprise. Key capabilities and standards include:

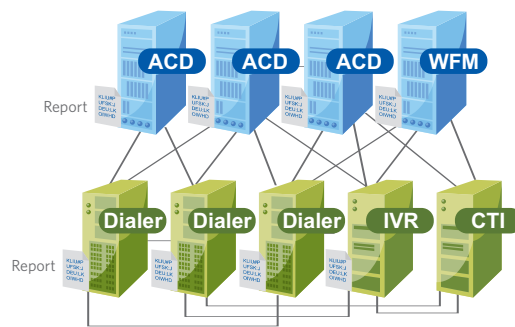
- SIP (Session Initiated Protocol): SIP is a mature, standard protocol that initiates, modifies and terminates interactive communications sessions. One of the key advantages of SIP is that it allows for the exchange of information in a standard format without requiring expensive proprietary equipment phones, telephony cards and gateways. Because it promotes interoperability between equipment and applications from various vendors, SIP gives companies more choices, enabling them to eliminate vendor lock-ins, as well as easily and seamlessly move to a Voice over Internet Protocol (VoIP) infrastructure for an increased level of flexibility, efficiency, and cost savings.

- Service-Oriented Architecture (SOA). A key example of new standards-based approaches, SOA is a collection of services that communicate with each other, for example, passing data from one service to another or coordinating an activity between one or more services. SOA is a flexible architecture that unifies business processes by structuring large applications as an ad-hoc collection of smaller modules called services. These applications can be used by groups both inside and outside the company.
- Software as a Service (SaaS). SaaS is a software application delivery model where a software vendor develops a Web-native software application and hosts and operates (either independently or through a third-party) the application for use by its customers over the Internet. Customers pay not for owning the software itself, but for using it, and version upgrades are eliminated. Contact centers are assured of always using the latest technology without the business disruptions of software upgrades.

1970s - Standalone products



1980s and 1990s - CTI



2000s - Unified Solutions



**Conclusion**

Why in this day and age would contact centers want the hassle and costs associated with implementing and integrating point solutions? In a fast-moving world, it's important that contact centers, regardless of industry or size or business process, be lithe and flexible in order to respond rapidly to market shifts, to make changes to workflows as needed, or to scale the business rapidly. With a unified, standards-based approach, contact centers can take advantage of the openness and ubiquity of IP protocols and the maturity of standards like SIP, which support traditional telephony as well, to provide the foundation for a new and better contact center. Most importantly, the unified approach enables contact centers to leverage the benefits that come from having all of the key applications - ACD, voice self service, dialer, quality monitoring, email - in a single platform. In the long run, unified brings greater value to the contact center and the business by helping improving the productivity of agent, supervisor, and administrative staff. It also lends itself to increased revenue opportunities through improved cross-sell and up-sell opportunities because agents have access to better customer data. And, it can support an enhanced customer experience which will drive higher satisfaction and create greater loyalty.

Strategically, technologically, and simply as a matter of common sense, a unified approach is the answer.

### Appendix: Milestones in the History of the Contact Center

There are many important milestones in history that have transformed the way people and businesses communicate and interact:

**1876:** Alexander Graham Bell invented the **telephone**. For the first time, people had a way to conduct conversations immediately over long distances. In 1877, construction of the first regular telephone line from Boston to Somerville, Mass., was completed. By the end of 1880, there were 47,900 telephones in the U.S.

**1882:** As the adoption of telephones increased among businesses, it became very apparent that wiring countless telephone lines to a business was not practical. Leroy Firman received the first patent for a telephone **switchboard**.

**1900s:** Early **Private Branch Exchange (PBX)** switchboards were introduced, in which operators ran private company switchboards initially by hand.

**1948:** Mathematician Dr. Claude Shannon published "A Mathematical Theory of Communication," which promoted the concept of communicating in binary code. Shannon's paper formed the basis of the digital communications revolution.

**1971:** Erna Schneider Hoover received a patent for her work at Bell Labs - the first **computerized phone switching system**, based on concepts still in use today.

**Early 1970s:** As the volume of calls increased, utilizing receptionists to transfer calls became impractical, so the **Automated Call Distributor (ACD)** was introduced. One of the first large applications was a modified 5XB switch used by New York Telephone to distribute calls among hundreds of 4-1-1 information operators. With the advent of the ACD, the first "**call center**" was made possible. Companies could handle large volumes of inbound calls and have the ACD direct those calls automatically to the appropriate "Call Center Reps."

**1973:** Aspect Software founds modern-day inbound contact center industry with launch of the Galaxy, the first intelligent ACD; first customer is Continental Airlines

**1975:** First workforce management software launched by Aspect Software.

**1980s:** To save time spent in transferring the customer from one department to another and answering routine questions, **Interactive Voice Response (IVR)** technologies were introduced to provide automated Touch Tone navigation for customers. Consumers could key a number on their dial pad to direct themselves to the right department, or to check routine information - such as their account balance or store hours.

**1981:** Aspect Software founds modern-day outbound contact center industry with the launch of the first intelligent automated dialer.

**Mid-1980s:** Many call centers who wanted to contact consumers for follow up, bill collections, or to sell and market their products and services hired outbound calling agents. These agents were often frustrated by calling wrong numbers, getting busy signals, fax machines, answering machines, or no answers, leading to high turnover in the call center, poor efficiency, and the "sweat shop" stigma. The **Automated Dialers** were introduced to solve this business problem, later evolving to offer advanced signal detection and "**predictive**" capabilities to maximize the productivity of the outbound agents.

**1985:** Aspect introduces first standards-based ACD system with the launch of the Aspect® CallCenter® ACD.

**Late 1980s:** As technologies such as fax systems, call recording systems and voice messaging systems were applied to contact centers in the later 1980's early 1990's to address specific needs, **Computer Telephony Integration (CTI)** technologies were introduced to solve the challenge of integrating multiple technologies, but they added new complexities and challenges.

**Late 1990s: Unified solutions** have finally solved these contact center challenges, incorporating **Internet Protocol (IP)** and new Web-based architectures, while integrating traditional telephony.

**1996:** Aspect offers first generation of Unified Contact Center platform; invents virtual outbound enterprise campaign management

**2001:** Contact Centers begin making the migration from TDM-based infrastructures a converged packet-based network infrastructure

**Late 2002:** Contact Centers begin leveraging hybrid TDM/IP architected contact centers and Greenfield pure IP remote sites

**2007:** Aspect ships 800th unified contact center solution.

#### About Aspect Software

Aspect Software, Inc. founded the contact center industry and is now the world's largest company solely focused on providing session initiation protocol (SIP)-based Voice over Internet Protocol (VoIP) and traditional voice-based products and services for customer service, collections, and sales and telemarketing business processes. Each day, Aspect Software powers more than 125 million customer-company interactions at thousands of in-house and outsourced contact centers around the globe. Its trusted Signature product line offers automatic call distributors (ACDs), dialers, voice portals and computer telephony integration (CTI). The company's leading Contact Center Performance Optimization product line provides workforce management, quality management, performance management and campaign management applications. And, its pioneering Aspect® Unified IP™ product delivers a comprehensive, multichannel solution. Headquartered in Chelmsford, Mass., Aspect Software has operations across the Americas, Europe, Africa, the Middle East and Asia Pacific. For more information, visit [www.aspect.com](http://www.aspect.com).

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**Aspect Software**  
Corporate Headquarters  
300 Apollo Drive  
Chelmsford, MA 01824

978 250 7900  
978 244 7420 fax  
[www.aspect.com](http://www.aspect.com)

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Contact Center Solutions