



DMG
CONSULTING LLC



Cloud-Based Contact Center Infrastructure Product and Market Report Reprint

Reprinted for:

NICE · **CX** 

2021/2022

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1. Introduction

The cloud-based contact center infrastructure vendors have hit their stride by giving enterprises what they want – the agility to meet the dynamic omni-channel needs of their customers on an inbound and outbound basis. The vendors are investing in and competing to come up with the most successful approach, be it an out-of-the-box solution, a programmable platform or a combination of the best of both approaches. Enterprises are the winners in the CBCCI vendor differentiation battle, as these vendors are making multi-million-dollar R&D investments to enable their enterprise clients to deliver an outstanding and differentiated customer experience, cost effectively.

The Future of Contact Center Technology is in the Cloud

The future of contact center technology, systems and applications is in the cloud, even though the adoption rate of CBCCI seats was 17% as of the end of calendar year 2020 (based on DMG Consulting *2020 Worldwide Cloud-Based Contact Center Infrastructure Market Share Report*). While the vast majority of contact center seats are still on-premise, and will continue to be for the foreseeable future, the innovation is focused on cloud-based solutions. Vendors that offer both on-premise and cloud-based solutions are delivering first to the cloud and, in some cases, begrudgingly retrofitting enhancements to their often technologically outdated premise-based models. In other situations, contact center infrastructure vendors have committed to supporting their premise-based solutions for the life of the asset, while making it clear to their clients that they are not going to maintain functional parity with their cloud products.

It's somewhat surprising that many enterprises are still making major investments in premise-based contact center solutions, given the promise of minimal innovation from the vendors. However, low penetration numbers make it clear that there are still major impediments to the adoption of CBCCI solutions in many enterprises, which include several of the largest contact centers in the world. The vendors are minimizing these roadblocks, which include concerns about security, loss of control and reliability, and are quietly chipping away at them. However, these are clearly serious and deeply entrenched concerns that the CBCCI vendors need to address aggressively in order to open up a significant portion of the contact center opportunity.

What Is Required in a CBCCI Solution?

A CBCCI solution can come with various types of applications and modules and must include the two core capabilities: an omni-channel routing engine and dialing. This means that all other functionality is optional, and many of the features are differentiators for CBCCI vendors and the market. For example, if a CBCCI solution comes with native WFO or WEM capabilities, this is a plus, as it's something that many enterprise clients expect. If the CBCCI solution has its own unified

communication as a service (UCaaS) and video capabilities, it is even more compelling, as it is likely to address enterprises' expanding needs for a communications platform. But this is just the beginning, as DMG Consulting expects CBCCI functionality to become a standard productivity tool, like Microsoft Word, Excel and PowerPoint, in many companies in the next 10 years. When this happens, CBCCI functionality will be consumed by the majority of knowledge workers in organizations, greatly expanding the total addressable market for contact center functionality.

Under the Hood

There are substantial and growing differences in the technology and architecture of CBCCI solutions that were built (or rebuilt) from the ground up in the last 3 – 4 years, compared to the majority of offerings that came to market 5 – 15 years ago. The solutions that were introduced to the market in the last few years leverage the newest technology and design principles. They are likely to include: microservices, Solr (and other highly scalable databases built for the cloud), containers, orchestration, mobility, etc. The new contact center solutions can run in private and public cloud facilities and move easily from one to another. They can also be deployed on-premise or in a hybrid mode, which is important, as it allows vendors to invest their R&D dollars in one platform. Although many of the mature CBCCI solutions have been retrofitted to operate in public clouds, the older architectures are generally slower and clunkier than current generation cloud-based solutions. In some cases, the differences are transparent to system users, but when adding new functionality or changing the user interface of a CBCCI solution built on an older technology stack, they are impactful, as development and processing can take longer.

In an ideal world, all of the CBCCI vendors would redesign and rebuild their infrastructure to take advantage of the architectural and processing innovations that have recently become available for native cloud solutions. The primary reason why some of the vendors have not taken this approach is that they do not have the R&D resources or budget to make the investment. As time passes, the differences between early-generation CBCCI solutions and current offerings will become more apparent and will drive vendors to either make the necessary investments or sell their company to a third party with deeper pockets.

Best-of-Breed Solution vs. Customizable Platform

This is one of the great debates in the CBCCI market today, even though it's really another take on the classic build vs. buy discussion. Enterprises want the agility to change and adapt their customer-facing solutions quickly and easily and without waiting for their company's IT department to make the changes for them. For this reason, many enterprises want a contact center infrastructure solution that comes with the WFO/WEM modules they need (quality management, workforce management, surveying, etc.) out-of-the-box and provide a low-code/no-code

development environment so system changes and modifications can be made by a business analyst or operations manager who works in the contact center.

During the past 20 years, the market has pushed vendors to deliver “all-in-one” contact center solutions that work out-of-the-box, but preferences are changing as companies strive to deliver an outstanding and differentiated customer experience. As a result, the CBCCI market consists of many solutions that deliver “all-in-one” functionality, as well as vendors that offer platforms and programmable application programming interfaces (APIs) that allow users to build their own solution, and a growing number of vendors who are striving to open up their platforms to allow for customization.

Year of the UI

The year 2021 will become known as the year of the user interface (UI) in the CBCCI market. Vendors continue to innovate, and a major focus is to simplify and enhance the agent experience by making it easier for them to seamlessly meet customers in their preferred channels. These efforts are going beyond workflow and processing improvements to include investments in artificial intelligence and automation. Vendors are starting to build in a variety of productivity and empowerment tools within their agent interface, including automated access to knowledge bases, speech-to-text functionality to transcribe the entire conversation and to automate the wrap-up process, contextual search functionality, and more. The new generation of advanced agent interfaces is employing automation to reduce the amount of repetitive low-value work performed by agents and to deliver AI-enabled next-best-action or real-time guidance capabilities that enhance the entire agent/customer experience. The objective is to make it easier for agents – whether on-site, remote, or hybrid – to do their job by giving them a single desktop (or “pane of glass”) where they have visibility into each customer’s prior interactions and can easily pivot from one channel to the next. Everyone wins – agents, customers and the enterprise – as this also makes it easier for customers to conduct their business, which, in turn, reduces the time and cost of servicing while improving their experience.

Acquisitions Reflect Market Trends and Opportunities

The strengthening demand for CBCCI solutions during the past 18 months has fueled the competitiveness of many of the vendors. The market is undergoing a “land grab” as vendors strive to quickly bring on new customers and seats. Adding to this push is the understanding that contact center infrastructure solutions are sticky. This is driving software vendors from outside of the contact center market to purchase contact center vendors. And it’s encouraging CBCCI vendors to acquire complementary applications, such as WFO/WEM capabilities, instead of spending the many years it would take to build this functionality themselves. (Puzzel purchased stand-alone WFM vendor U-WFM in April 2020; Five9 purchased WFO vendor Virtual Observer (formerly CSI) in February 2020; and 8x8

purchased Quality Software Corporation (QSC), a QM and recording vendor, in 2015.)

Given the large number of CBCCI competitors, it's logical to expect this market to consolidate. This has not yet occurred on a large scale because of the risks associated with this type of merger. The challenge is that when one CBCCI vendor acquires another, one of the two portfolios is vulnerable to being targeted by third-party vendors, as it is unlikely that the acquiring vendor will support two similar go-to-market solutions. As a result, most of the acquisitions in the CBCCI market have been by an outsider, as is the case with Zoom's purchase of Five9, announced in July 2021, or when NICE, a WEM vendor, acquired inContact in May 2016. However, in May 2021 Aspect merged with Noble Systems and then rebranded as Alvaria. (Since neither Aspect or Noble Systems had a significant number of CBCCI customers at the time of the merger, the risk was small and there were a number of other factors that made this a compelling move for the vendors and their customers).

Two additional acquisitions of contact center software vendors, which extend beyond the contact center market, include Uniphore's purchase of Jacada and Qualtrics addition of Clarabridge, both announced in July 2021. A simplistic view of these purchases is that they are small tuck-ins. However, in both cases, DMG expects that the purchased capabilities will be pivotal to the future of each of the acquirers. The strategic perspective on the purchase of Jacada, Clarabridge and Five9 is that the market is anticipating the growing adoption of contact center software throughout the enterprise.

In the next couple of years, DMG expects to see more like-to-like acquisitions of CBCCI vendors, as this may be the best way for some of the vendors to upgrade their platforms and quickly grow their customer base, at least on a short-term basis. We also expect more enterprise software vendors to go shopping for a CBCCI solution. And we expect leading CBCCI vendors to buy differentiating capabilities.

CBCCI has a Very Bright Future

The dynamics of the contact center infrastructure market have been altered by the CBCCI vendors. DMG predicts that within 9 years, there will be intelligent, modularized cloud platforms that provide contact center infrastructure (automatic call distributor (ACD), dialers, etc.), analytics, WFO/WEM and customer relationship management (CRM) functionality, a prediction that is well on its way to becoming a reality. DMG expects the CBCCI market to continue to pick up momentum during the next 5 years, and likely for at least the following 10, as there are many premise-based seats to replace and even more new opportunities opening up. (New and fast-growing organizations will tend to adopt digital-first, cloud-based customer service models for their efficiency and flexibility.) It's not a question of whether or not the CBCCI market grows rapidly, only what the growth rate will be, as this is a highly opportunistic segment with a massive addressable market.

2. Cloud-Based Contact Center Infrastructure Trends and Challenges

Digital transformation is a game-changer that is opening many doors for the omni-channel cloud-based contact center infrastructure solution providers. Enterprises are finally giving their customers what they've wanted for the past five years – the ability to interact in their channels of choice, whether digital or voice – and pivot with persistence from one to another so that their activities and history follow along with them. Also changing are the channels that customers expect to be supported. This now includes video, which became a standard channel of communication during the pandemic, and needs to be incorporated into contact centers. Fortunately for many enterprises, meeting their customers' expectations by adding channels such as video and co-browse frequently delivers additional benefits. As an example, the use of video to help diagnose service issues can dramatically reduce the volume of truck rolls for field technicians, and co-browse – both self-service and agent assisted – helps ensure documents are completed or orders are placed correctly the first time. These enhancements deliver dual benefits to enterprises by reducing costs while improving the customer experience.

Although expanding channel support is a step in the right direction (albeit long overdue), customers expect more from their service providers. Consumers are starting their sales and service journey on their own, via self-service capabilities. The challenge is that the vast majority (DMG estimates over 95%) of the voice self-service solutions (i.e., interactive voice response (IVR) applications) in the market use an ineffective voice user interface (VUI) and outdated technology and processes. It's time for companies to transition from their 5- to 15-year-old IVRs to next-gen AI-enabled conversational intelligent virtual agents (IVAs).

The pandemic has forever changed customer behavior and for service and support, and companies need to respond by ensuring that their contact centers are using technologies that meet today's requirements. Migrating to a feature-rich, sophisticated, cloud-based contact center infrastructure solution is a great place to start.

2.1 Cloud-Based Contact Center Infrastructure Trends

The contact center infrastructure market has become one of the more attractive technology sectors during the past two years, catching the attention of some of the big names in the technology world, including Salesforce, Zoom and Facebook. This is due to its sizeable total addressable market (TAM) and stickiness with enterprise buyers. DMG expects to see additional enterprise software vendors

enter the cloud-based contact center infrastructure market in the next few years as contact center functionality is rolled out more broadly within organizations and ultimately becomes a standard productivity tool that is available to most knowledge workers.

As interest in and the market opportunity for sales of contact center technology and applications grows, so too does the level of R&D in these solutions. The CBCCI vendors are making major R&D investments, and in some cases, “bets” to broaden their solutions in response to the demands of their enterprise customers. The most significant areas of investments are in AI, automation and analytics to enable companies to improve the productivity and effectiveness of their service organizations. This includes investments to enable companies to deliver a proactive and personalized level of service. These enhancements are also attracting the attention of managers outside of contact centers who are seeking similar capabilities to improve other aspects of the customer journey. Executives are also looking for systems that provide oversight of work-at-home employees, as this trend is here to stay for the foreseeable future in many organizations.

The increase in sales and adoption is also fueling a major replacement cycle for some standard features of CBCCI solutions. The market is undergoing a wholesale (and very needed) upgrade of agent desktops and UIs to omni-channel servicing environments that allow them to pivot easily from one channel to another. The CBCCI vendors are also updating their design and development environments that are used to set up the system routing and self-service logic. These next-generation administration modules are being built to support the low-code/no-code preferences of business managers who do not want to be dependent on IT to support them. Even better, the more flexible routing and queuing capabilities are being designed to incorporate AI-based logic that can “self-improve,” as needed, on the fly.

Self-service is another area of major investment for the contact center market. Customers are demonstrating a desire to help themselves, and only when the systems fail to provide them with the information they need do they ask for assistance from live agents. The CBCCI vendors are in the early stages of enhancing their self-service capabilities. They are striving to provide conversational bots or IVAs and expand them beyond the traditional voice channel.

Customers are asking their CBCCI vendors to provide much more than an ACD and/or dialer functionality. These omni-channel solutions frequently include native or fully integrated third-party WFO/WEM modules, context-sensitive knowledge bases, intelligent self-service and automation, and an expanding list of new capabilities not previously seen in contact center solutions. See Figure 1 for a list of trends driving change and innovation in the CBCCI market.

Figure 1: CBCCI Trends

CBCCI Trends	Adoption of CBCCI continues to pick up momentum in companies and government agencies of all sizes and verticals around the world; COVID-19 was the accelerator, but growth rates are expected to remain high once the pandemic is gone.
	The CBCCI competitive landscape is changing due to mergers and acquisitions (e.g., Zoom’s acquisition of Five9 and the merger of Aspect and Noble Systems); the entrance of formidable competitors from other IT sectors (e.g., Salesforce and Facebook); as well as the emergence of new competitors.
	CBCCI vendors are making major R&D investments in AI-enabled capabilities to assist their clients in meeting their customers’ demands for an outstanding customer experience.
	The CBCCI vendors are converting their design and development capabilities for setting up call flows, omni-channel routing, (IVR and IVAs to low-code/no-code environments.
	The CBCCI vendors are enhancing their agent desktop applications and UIs to enable them to support voice and digital interactions in a single pane of glass.
	Digital-first and self-service continue to pick-up momentum as customers’ channels of choice; voice remains the channel of last resort.
	Demand for fully integrated CCaaS and UCaaS capabilities is on the rise.
	Enterprises are placing more emphasis on the customer journey and are looking for tools to better understand it as they realize that the CX is less about a discrete interaction and more about the overall relationship with the brand at all touchpoints.
	Retailers are dealing with a new normal, which includes an unwillingness of many shoppers to return to brick-and-mortar stores; they are getting creative and making it easy for customers to shop using video and co-browse channels.
	The April 1, 2021 US Supreme Court ruling that narrowed the Telephone Consumer Protection Act (TCPA) automatic telephone dialing system (ATDS) definition is generating renewed interest in outbound solutions for voice and short message service (SMS).
Enterprises in many verticals are recognizing the growing importance and contributions of contact centers for their business and are investing to enhance these departments.	
Many contact centers that sent employees home to work during the pandemic are asking them to return to the office on a full-time basis, or are transitioning to hybrid staffing models that use a mix of on-site and remote agents.	

Source: DMG Consulting LLC, September 2021

2.2 Cloud-Based Contact Center Infrastructure Challenges

The CBCCI market is entering a new phase, one that is going to involve a great deal of change. This can be seen in the shift in the competitive landscape, major R&D investments, increasing number of distribution partnerships, growing application ecosystems/exchanges, and willingness of the vendors to think creatively about new ways to use CBCCI solutions. Although this market has competitors coming from many IT segments (DMG estimates there are over 200 CBCCI vendors globally), the majority of them are cut from the same cloth – contact center technology solution providers – until recently. The entrance of non-

contact center infrastructure vendors into the CBCCI market is shaking up the sector and pressuring traditional competitors to go outside of their comfort zone. DMG expects to see an acceleration in the rate of merger and acquisitions (M&A) in the CBCCI market, which will include purchases by other enterprise software vendors and mergers between some of the smaller CBCCI vendors.

It's one thing to buy a CBCCI vendor and another to know how to manage the acquired company and its solutions. There are always risks when one vendor buys another, and this is especially the case when the purchaser has no or highly limited experience in an acquiree's market. Contact centers, which have flown under the radar for decades, are unique operating departments. Best practices that work in many other enterprise departments are often ineffective or even detrimental in contact centers. Vendors that are buying (and possibly building) their way into the contact center market need experienced resources with the knowledge and expertise to pave their way.

The pandemic changed many aspects of the servicing world, and there is no going back to the past. Topping this list for the CBCCI vendors is the need to assist their clients in meeting a new set of expectations from consumers. Among these demands is support for an ever-growing list of channels (primarily digital), a personalized customer experience that feels like face-to-face (but isn't), and the ability for customers to help themselves via sophisticated and intelligent conversational self-service applications. For some CBCCI vendors, keeping up with the evolving expectations is doable – they have sufficient R&D resources, their solutions are built on modern technology and leverage AI, and their offerings run in public data centers. However, as the pace of innovation and differentiation picks up, smaller competitors are going to be challenged, driving the next wave of M&A.

And it's not just consumer expectations that have changed forever. Many employees who have thrived in a work-at-home environment for more than a year are not willing to return to the office full-time – and some would rather quit than work onsite even part-time. Given the historically high agent attrition rates in contact centers, being able to accommodate WAH and hybrid staffing models (a mix of on-site and remote days/hours) to minimize additional employee losses is a must. To do this, contact center leaders need solutions to help them manage a flexible workforce, maintain the highest levels of security, and empower and engage employees day after day. See Figure 2 for a list of challenges confronting the cloud-based contact center infrastructure market.

Figure 2: CBCCI Challenges

CBCCI Challenges	While adoption of CBCCI is growing rapidly, concerns about security, reliability and control are still impediments in large and complex operating environments.
	Contact center leaders don't want to give up the level of control they traditionally held over their agents; however, there is a growing realization that they need to allow for staffing flexibility (i.e., WAH and hybrid staffing models) if they want to be able to hire and retain outstanding employees.
	The entry of non-traditional CBCCI players, including Salesforce, Facebook, Zoom, and others, is changing the competitive landscape.
	Prospects care less about what "bucket" their vendor historically resides in (e.g., traditional CBCCI, CRM, carrier, etc.), and more about getting exactly what they want from a single vendor.
	CBCCI vendors need to provide out-of-the-box integrations and easy access to APIs to enable their customers to easily customize their solutions.
	CBCCI vendors who are building their own native WFO/WEM capabilities are finding it difficult to compete with best-of-breed capabilities, as their solutions frequently lack features and functionality found in more mature applications.
	Customers expect an increased level of transparency from their solution providers; CBCCI vendors need to "pull back the curtain" and allow increased access to provisioning environments and other "black box" portions of their applications.
	Many of the CBCCI solutions in the market are built on outdated technologies and are in need of a complete overhaul to make them more responsive, flexible and cost-efficient to operate and manage.
	Partners (e.g., value-added resellers (VARs), contact center integrators, consultancies, etc.) who have historically depended on revenue generated from standing up contact centers are looking for new sources of revenue as the growth of open cloud platforms and availability of APIs are drastically reducing the need for custom integrations and lengthy implementations.
	Companies that added digital channels during the pandemic are confronting the challenge of how to integrate them properly in order to provide a seamless service experience that allows customers to pivot from one channel to another.
	Consumers expect a personalized and outstanding CX and are unforgiving of brands that do not deliver.
	Many enterprise executives who want to elevate their service experience are struggling to make the necessary changes.
	Customers who want the benefits of face-to-face contact without being there in person are demanding more collaboration capabilities from the brands with whom they interact.
	Customers want to use self-service tools but become easily frustrated with poorly trained and ineffective IVA solutions.
	Companies need effective knowledge management (KM) solutions that can deliver a single source of truth to all employees and customers alike.
Ever-increasing usage of video, co-browse, and a plethora of text-based channels requires a "single pane of glass" for agents; vendors who have not updated their UIs to provide this functionality are falling farther behind the curve.	

Source: DMG Consulting LLC, September 2021

3. The Contact Center Reimagined

The pandemic has altered the global business environment in a lasting way, though most of the changes would have occurred eventually, albeit slower. The companies that will be best positioned to thrive post-pandemic are those that used this time to reset strategies, reimagine opportunities, and redesign their futures. The playbook for the "new normal" will likely follow three major trends: the migration to the cloud, digital transformation, and the adoption of smart technologies (AI and automation). See Figure 3.

Figure 3: Enterprise Transformation



Source: DMG Consulting LLC, September 2021

Business leaders came to better appreciate the contributions of their contact centers during the pandemic. To their credit, contact centers all over the world displayed an amazing level of flexibility and responded very rapidly and effectively to the need for change. These departments successfully moved hundreds and thousands of employees on-the-fly from on-site to work-at-home environments, transitioning in a matter of a day to a couple of weeks. Displaying remarkable agility, contact center agents were able to address customer needs and support the brand when no other department was available. The question that every person and company should ask themselves is what is next? The world has changed, and so must contact centers and service departments.

The events of 2020 changed the way companies interact with their customers and have accelerated the digital transformation. This is enabling contact centers to evolve from transaction-oriented departments to relationship-focused service providers. Automation and AI-enabled solutions, including IVAs, virtual assistants (VAs) and robotic process automation (RPA), are being deployed to handle an increasing percentage of low-value activities previously performed by agents, such as data propagation, form completion, auto-retrieval and fulfillment. This is a game-changer, as it frees agents to provide personalized service to customers in their channels of choice, enhancing the customer and agent experience while improving productivity. Intelligent systems and tools give agents the information they need and the time to elevate each customer experience from an information-gathering and delivery exercise to a problem-solving and relationship-building session. Upgrading operating systems is a necessary step in a contact center digital transformation and positions companies to reimagine the role agents play in delivering an outstanding CX. It's one of the keys to upgrading the agent/customer relationship, positioning agents to do what they signed up for – helping customers – and vastly improving the perception of the company.

Expanding Contact Center Contributions

Contact centers know more about what happens in companies than most, if not all, other departments. Contact centers capture the voice of the customer using a number of systems, including: recording, interaction (speech and text) analytics, quality management, surveying, customer journey analytics, CRM, and more. In well-managed contact centers, the findings are used to improve all aspects of the department's performance. The information is typically applied to elevate the quality of service, increase productivity and enhance the agent experience. But companies would realize much broader benefits from customer insights if the contact center were invited and encouraged to share this information on a formal basis with all appropriate departments, including senior management. The information gathered by contact center analytics solutions should be used to identify the actions required of every employee in all customer-facing departments, to expedite issue resolution and improve the customer experience.

Unfortunately, this is not how it works in most companies today. Instead of welcoming feedback from contact center executives and analytics solutions, this information is shunned or ignored by other department leaders. By extension, the contributions of contact center agents are also often minimized. Front-line agents are frequently measured on productivity, schedule adherence, willingness to work overtime and how long they've stayed in their job, rather than using a balanced approach that takes into account customer-centric metrics, productivity, professionalism, and more. In too many companies, agents are not paid a living wage, even though they work full time. This is an imbalance, as companies treat their agents like entry-level workers while asking them to take on a great deal of responsibility to build customer relationships and enhance their brand. Moreover, updating contact center technology often falls to the bottom of IT's list of priorities. If executives treat contact centers as important contributors to their success,

instead of as an expensive, albeit necessary, function, other department heads will follow their lead. This will help to improve the perception of the contact center and, by extension, the role and contributions of agents.

Contact Center Workplace Requirements

Companies also need to rethink workplace requirements, specifically which functions must be performed by office staff and which can be done by at-home employees. The pandemic proved that contact center employees – agents, supervisors, managers, quality management specialists, workforce management administrators, business analysts, and reporting specialists – can generally work as productively from their homes. The work-from-home model is beneficial for disaster recovery and business continuity, reducing real estate costs and decreasing agent shrinkage, in addition to accommodating the needs of employees who are reluctant to return to the office or simply prefer to work remotely. DMG expects the majority of contact centers to operate hybrid models that include at-home and in-office workers as they enter 2022.

Reposition your Contact Center

Contact centers have undergone more positive changes in the past 18 months, than most have experienced in the prior 10 – 15 years. Innovative enterprise and contact center leaders are using this opportunity to accelerate their digital transformation. Contact center leaders need to re-imagine all aspects of the department, including its mission, goals, policies and procedures, systems, key performance indicators (KPIs), job descriptions, and more. If this transition is done properly, contact centers will be viewed as important company contributors that build the brand, interaction by interaction, and provide the strategic insights that enhance the CX throughout a company. DMG encourages all companies and contact centers not to return to the old ways of business as usual but instead to use everything they've learned in the past 18 months and apply it toward a new and exciting future.

4. Into the Future

The pace of innovation in contact centers is more rapid than at any time in the 45-year history of these essential customer-facing organizations. Two technology categories are driving the surge of innovation: AI and automation. Artificial intelligence is an exciting grouping of technologies, particularly when it comes to contact centers, where it has many practical uses and the potential to improve operating environments. These technologies are being leveraged by many contact center applications, including routing, self-service, interaction analytics (IA), analytics-enabled quality management (AQM), workforce management (WFM), KM, and others. AI-enabled contact center solutions are in their infancy, and the vendors are investing a tremendous amount of money and effort in these initiatives. These investments are paying off, and there is a flow of much more intelligent applications coming into contact centers.

Machine learning (ML), an AI technology, is helping companies identify new and improved approaches to solving old problems. In the contact center, machine learning is a natural complement to audio and data mining solutions (speech and text analytics) and is used to enhance indexing and search accuracy, facilitate automated discovery of trends or topics, and identify correlations. Additionally, ML is used to improve routing of digital and voice interactions to agents, enhance chatbot/virtual agent capabilities, deliver context-based resource material from knowledge management solutions, and much more.

Predictive analytics, another practical use of AI and ML, is an emerging grouping of technologies and a strategy for managing a personalized customer experience. Using a large volume of captured data, a predictive model can be built to anticipate the likelihood or probability of future events, propensity of behaviors or occurrences, as well as their potential business impact. Predictive analytics can be used to understand what customers need and want, then kick off real-time agent guidance, next-best-action recommendations or optimal marketing/sales offers for the benefit of both the customer and the organization. Predictive analytics is frequently used to provide deeper insights into the customer experience by predicting customer satisfaction or NPS for all digital and voice interactions, based on results from similar contacts.

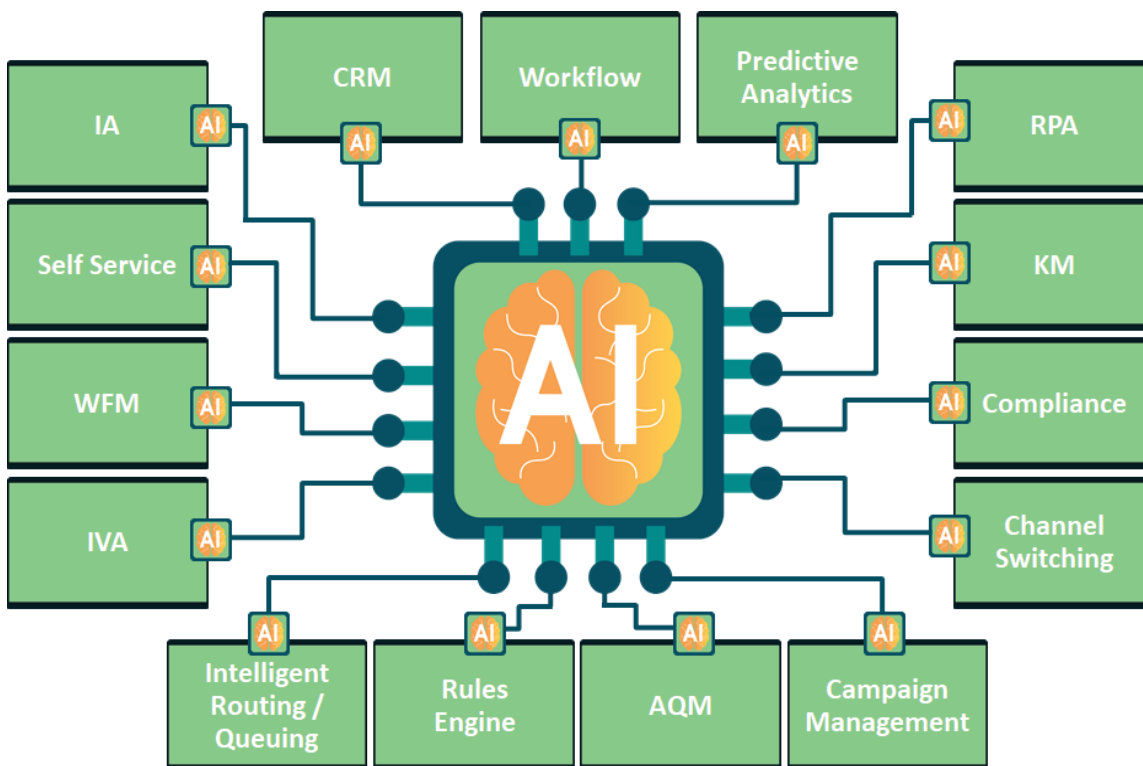
Artificial intelligence technologies are also being leveraged by RPA solutions, ushering in a new standard of intelligent automation for customers and agents. While some of these technologies are applied with a focus on enhancing the core capability of RPA – automation – the wide variety of AI tools being leveraged by these solutions highlights the evolution rapidly taking place in this market. Notable AI additions include computer vision (enabling RPA applications to read and capture data in one system for use in another system without the need for integration); machine learning (used by leading vendors to automatically discover and recommend future automation opportunities); and natural language processing (NLP)/natural language understanding (NLU) (utilized to determine

customer sentiment and intent and present agents with real-time guidance based on this knowledge). Computer vision technology, complemented by ML, is being leveraged to “read and learn” from procedure documents, knowledge-base articles and even pictures, and be automatically translated into process guidance and RPA flows. And, to ensure a constant flow of automation opportunities, the more complete RPA suites come with a module to help enterprise users identify appropriate processes for automation. Robotic process automation applications leverage AI technology today, and this is being enhanced to tackle new tasks and increase the benefits of these solutions.

The Future Role of AI in Contact Centers

Using AI to improve the performance of each contact center application is one thing; applying AI to enhance the overall performance of the contact center operation is better, particularly if all of the systems work in concert and the intelligence flows between the applications. Getting contact center systems to work in cooperation with each other has been a goal for managers throughout the years, as each new application came to market to address a specific challenge. (This goes far beyond sharing data with one another, which some of the contact center solutions already do.) See Figure 4.

Figure 4: The Contact Center AI Brain



Source: DMG Consulting LLC, September 2021

Figure 4 presents the concept of a contact center AI “brain” that functions as the intelligent control center for all of the applications, each of which has its own AI capability. The AI brain looks into all of the solutions used by the contact center and discerns what they know and what they are going to do, so it can optimize what each application undertakes for the benefit of the department. This is the vision and direction that contact centers should take, as it will solve many of the current application conflicts in these departments. For example, harmonizing the intelligent routing capabilities of ACDs and WFM solutions will have a discernable and measurable benefit. Additionally, it will likely eliminate the need for many contact centers to have a team of analysts, and sometimes PhDs, to manipulate their forecasting data in Excel or another analytics tool prior to feeding it into the scheduling application.

AI functionality is now part of most, if not all, contact center applications. The innovations being enabled by AI are expected to allow managers to substantially improve the performance of their contact centers while enriching the agent job experience and reducing operating expenses. Implementing one AI-enabled application at the expense of another essential system will not be a benefit for most contact centers, which is why the AI brain is a necessity. In the meantime, companies should pay close attention and carefully analyze the emerging AI features of the solutions in which they are investing and make sure that ease of integration and data sharing are core capabilities of any contact center system they purchase.

5. NICE CXone

COMPANY OVERVIEW

Founded: 1997
Ownership: Public (NASDAQ: NICE)
HQ: Salt Lake City, UT
of employees: ~7,000
Key Verticals: Government, healthcare, financial services, retail, e-commerce, business process outsourcers (BPOs), consumer and business products and services, travel and hospitality

PRODUCT PROFILE

Product Name: NICE CXone
Deployment Models: Public cloud, hybrid

NICE CXone is a global provider of cloud-based contact center infrastructure, workforce optimization (WFO)/workforce engagement management (WEM) and global carrier services. NICE CXone’s cloud-based contact center infrastructure strategy is “to turn the customer experience into a competitive advantage by delivering a purpose-built cloud-native contact center suite and platform to help organizations achieve their business goals with greater ease and reliability.”

PRODUCT OVERVIEW

NICE CXone is a cloud-based contact center infrastructure solution deployed in NICE’s data centers or hosted on Amazon Web Services (AWS). Native omni-channel capabilities include: voice, interactive voice response (IVR)/intelligent virtual agent (IVA) for voice and email, chat/proactive chat, short message service (SMS), multi-media messaging service (MMS), messaging, website, social media, mobile app, and third-party apps. Out-of-the-box language support for agent and admin user interfaces (UIs) includes English, Chinese, French, German, Italian, Japanese, Korean, Portuguese, Russian and Spanish.

FUNCTIONAL OVERVIEW

ACD

CXone supports skills-based, case-based, conditional, adaptive real-time, service-level, data-directed, sentiment-based, personality-based, value-based, AI-driven and analytics-enabled routing. CXone provides a drag-and-drop graphical UI with a library of pre-defined “actions” to build and maintain omni-channel routing strategies. The Workforce Intelligence engine supports automated routing rules, which execute actions needed when a queue service level (SL) falls below a configurable threshold, notify the manager, and revert to previous settings when the SL normalizes. The interface includes automatic speech recognition and text-to-speech and facilitates integration with customer and agent-facing self-service IVAs. Proficiency levels take into account agent skills, skill proficiency and concurrency limits.

Customer relationship management CRM

CXone has out-of-the-box integrations with Salesforce (Sales, Service, Government and Health Clouds), Oracle Service Cloud, MS Dynamics, ServiceNow (CSM and ITSM), Zendesk, NetSuite, SugarCRM, SAP C4C and Bullhorn CRM systems. Agent functionality can be embedded into the CRM interface, or the CRM can be displayed in an integrated panel in the agent UI. It includes the ability to handle voice and digital interactions, synchronize CRM information, and automatically create/update CRM cases or activities with interaction data (e.g., call recordings, email and chat transcripts).

Self-service and automation

Studio, NICE’s visual design and orchestration tool, provides a drag-and-drop environment for the creation and maintenance of omni-channel routing strategies, IVR scripts, self-service flows for voice and digital contacts and real-time alerts. Capabilities include menus, prompts, direct database connectivity, web integrations (REST, SOAP), pre-built CRM integrations and customizable surveys. Text-to-speech (TTS), speech-to-text (STT) and automated speech recognition (ASR) are supported. CXone has a configurable artificial intelligence (AI)-based IVA that is engine-agnostic. The IVA, bots and conversational/visual IVRs hook into Studio for the development of self-service capabilities

	<p>with full control, context and auditing capabilities. This includes the ability to retain context and provide relevant responses across channels, including warm handoff to a live agent. The Studio workflow provides a visual of the flow for the overall interaction, including conversation and logic.</p> <p>NICE has two native robotic process automation (RPA) solutions: NICE Robotic Automation for unattended automation of front- and back-office activities, and NEVA for attended automation and real-time agent guidance. Unattended bots operate on virtual servers and can be triggered by a work queue, business rules, or manually by a front- or back-office employee. Attended automations are presented either via on-screen callouts or an automation flow on an agent’s desktop. The specific callout is selected dynamically, in real time, based on pre-defined business rules or other definitive variables and parameters. Front-end and post-interaction automation is available across all channels.</p>
<p>Agent UI/UX</p>	<p>CXone’s HTML5, 100% thin client agent interface natively supports omni-channel handling modes for inbound and outbound interactions. Customer Cards provide agents with cross-channel interaction history, context and customer profile data. Agents can add to or pivot between channels during an interaction. Channels and the number of concurrent interactions are configurable. If licensed, the agent UI provides unified access to WEM features such as scheduling and time-off planning, quality management (QM) evaluations and coaching sessions. Agents also have access to their own dashboard where they can see personal and team productivity and performance trends for today, yesterday, last 7 days or custom time frames.</p>
<p>Supervisor UI/UX</p>	<p>The web-based supervisor interface is mobile-enabled and can be used on any device that supports HTML5. Real-time dashboards provide supervisors with insights into queue and agent performance, including the ability to live-monitor, whisper-coach and take over calls. An enterprise messaging solution for text-based coaching can be implemented using a panel in the agent interface. A color-coded display provides visual indicators of SL or other key performance indicators (KPIs) that exceed defined thresholds. Supervisors can drill down into real-time views for cumulative or historical data on a single agent (e.g., time in state, contacts handled), as well as queue performance. All supervisor functions are available via API and can be incorporated into the CRM.</p>
<p>Native WFO/WEM</p>	<p>CXone natively offers audio and digital channel recording, QM, analytics-enabled QM, surveying/VoC, WFM, interaction (speech and text) analytics, desktop analytics, customer journey analytics, predictive analytics and attended and unattended RPA. NICE CXone partners to offer supplementary WFO/WEM capabilities, including performance management/gamification (Clearview), and knowledge management (RiverStar, Unymira, Shelf IO, LivePro, Inbenta).</p>
<p>FUTURE</p>	<p>Planned enhancements during the next 12 – 18 months include:</p> <ul style="list-style-type: none"> • Enlighten AI behavioral evaluation in QM – application of Enlighten AI models to automatically assess agent behaviors/soft skills to provide insights on how agents can make changes that result in higher CSAT • Enhanced CRM integration – will embed AI-enabled real-time agent guidance on next best action, behavior, and answers from the knowledge base into CRM agent desktops • Virtual assistance – expansion of both native and third-party capabilities and integrations across customer and agent-assist hubs • Enhanced interfaces – Enlighten AI guidance displayed in refreshed user interfaces for agents, supervisors, and designers (studio). • Guided website experience – smart proactive website engagement to lead visitors to the optimal path to resolve their needs via knowledge, self-service, or agent assistance

About NICE

With NICE (Nasdaq: NICE), it's never been easier for organizations of all sizes around the globe to create extraordinary customer experiences while meeting key business metrics. Featuring the world's #1 cloud native customer experience platform, CXone, NICE is a worldwide leader in AI-powered self-service and agent-assisted CX software for the contact center – and beyond. Over 25,000 organizations in more than 150 countries, including over 85 of the Fortune 100 companies, partner with NICE to transform - and elevate - every customer interaction. www.nice.com

About DMG Consulting LLC

DMG Consulting LLC advises enterprises, vendors and the financial community on all aspects of building, acquiring, operating, optimizing and investing in contact centers, to enhance their enabling technologies and the customer experience (CX). A leader in vendor-agnostic research and consulting, DMG is the only firm whose expertise spans operations and technology. DMG is the primary source for market activity and revenue data and analysis for contact center IT segments. It publishes annual in-depth reports on contact center and back-office industry sectors, including cloud-based contact center infrastructure (contact center as a service, CCaaS), digital customer service, intelligent virtual agents, interaction analytics, robotic process automation (RPA), workforce management (WFM), workforce optimization (WFO) and more. These reports provide the accurate market share, trend identification, growth predictions, functional capabilities and pricing information DMG's global clients rely on to make critical business decisions.

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