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# Accelerating the Next Generation Contact Center

## In this issue

Welcome	2
Leaning In: The Future of Contact Center	3
The Future of AI	6
Customer experience – Hype vs. Hope	8
When the Hype Isn't Hype: Why the Contact Center will matter more than ever	11
The six essentials for the customer experience platform of the future	13
Research from Gartner Hype Cycle for Customer Service and Support Technologies, 2020	18

# Welcome

## Hope and Hype – The Contact Center Revolution

The landscape for customer sales and service was profoundly impacted by the 2020 global pandemic, thrusting business executives and IT leaders into rapid adoption of a new customer experience reality.

The contact center, long considered an operational cost center in the enterprise, emerged as a critical touchpoint in the customer journey. Across the world, physical interactions were almost completely replaced by digital.

Former planning assumptions about future investments in emerging cloud technologies such as AI, conversational IVRs, intelligent virtual assistants and experience management orchestration were accelerated by a factor of 24 months or more.

This document provides a glimpse into key future-looking vision from Cisco's Contact Center leadership team. It covers a range of topics that are top of mind for business and IT professionals amid adapting to this new environment.

Read on to hear firsthand perspectives from contact center leaders representing decades of collective technology experience across the spectrum of emerging customer service and support solutions described in the included Gartner Hype Cycle.

# Leaning In: The Future of Contact Center

*By Omar Tawakol*

*GM/VP, Cisco Contact Center*

We are in the midst of a pivotal time in the evolution of the contact center. Long-standing paradigms are being superseded by an entirely new set of assumptions and emerging technologies.

The global pandemic of 2020 has altered the business landscape in significant ways. One of the most obvious is the massive shift to digital vs. physical interactions.

Shopping malls emptied out, and contact center queues immediately filled up. Businesses responded with new technologies and approaches to resource management and fulfillment. There is no question that the role of the contact center has been elevated to a new status, and no doubt this position will continue to evolve in the future. For the first time in history, contact centers have become the primary face of customer experiences across the world.

A winning contact center strategy focuses on three objectives as identified by leading customer experience experts:

1. First, is to focus on helping customers accomplish their goals when engaging with a business.
2. Second, is the infusion of low effort customer experiences by developing easy experiences.
3. Third, is to create a positive emotional impression which can lead to loyalty and word of mouth referrals.



At Cisco, we've been busy building on our success as a leading global provider of contact center solutions, including #1 share in the world's largest market - North America. We've earned the trust of our customers by exceeding their expectations in customer service, and delivering scalable, flexible and highly secure software platforms. We've successfully developed a rich agent experience, aided by artificial intelligence and data insights, and the value-add solutions of our large partner ecosystem.

And now we are focusing on the "next", as the demands of consumers for rich, personalized experiences continues unabated. To address these demands, we are focusing our efforts in four key areas.

- 1) **Digital-first customer experiences** – Customer contact has clearly evolved to a digital-first approach, and the contact center is a critical part of that journey. Often the first point of contact for an organization is via a mobile app, or a website – especially for certain generational segments.
- 2) **API-centric** – Leading with APIs ensures that Cisco partners and the software developer community have the ability to create value-add revenue generating solutions that meet the unique needs of their buyers.
- 3) **Journey-centric** - Contact centers are part of the continuous customer journey, and easily the most data-rich entity. With the right analytic power, it creates the opportunity to become predictive, anticipate customer needs, and change their experiences in real time.
- 4) **Creating a new category of resources** – In every contact center, agent performance typically settles around a distribution of three levels – some high

performing agents, some average, and some laggards. By surrounding the agent with AI-driven capabilities before, during, and after the customer interaction, you can move agent performance from the laggards and the average, to the "best" category of high performing agents, and turn them into a concept we call the "Super Agent".

As the contact center evolves, a series of businesses challenges will be readily addressed.

### **Flattening the resource curve**

Most relevant will be the flattening of the demand curve for human resources. With the cost of a contact center tied up in human capital costs, any impact to human efficiency has massive financial benefits for the business. Historically, as call volume grew in the contact center, so did agent head count. This was the only way to avoid long wait times that resulted in low customer satisfaction and churn. This will no longer be the case, as AI-based self-service solutions have quickly proven their ability to address large increases in call volume at scale, while improving customer satisfaction. One Cisco AI-powered Virtual Agent deployment recently automated more than 200,000 new contacts per day. We have embedded key AI capabilities into both agent and customer experiences, and intend to continue to do so.

### **Creating insightful customer experiences**

Our intention is to drive richer constructs for human-to-human interaction by exposing agents to insights that have never before been available to them – real-time customer sentiment insights from any touchpoint along the customer journey. Often, an incident pre- or post the contact center is the cause of customer experience disruption. Contact centers historically

have not been availed visibility into these events nor to real time customer sentiment that helps agents engage more empathetically, to better serve the customer in these critical moments. Our portfolio of Experience Management solutions delivers just that, acquiring sentiment at critical junctures and putting new insights at the fingertips of contact center agents.

### **Designing for the next generation**

To support today's more dynamic business environments, we'll be leaning into the low-code/no-code trend by introducing programmatic attributes into our contact center portfolio. This will allow our customers faster time-to-value by allowing non-developers to easily configure advanced contact center capabilities, and new customization opportunities for our partners. New usage-based models will allow customers to test and modify, without making big upfront commitments, and pay only for what is used once in production. The result? The ability to enable a full-featured contact center in hours – with full configurability and APIs to provision phone numbers, and layer on channels that drive intelligence into workflows such as speech recognition, natural language processing (NLP) and intent detection.

### **Delivering a new kind of cloud platform**

We're nearing launch of a new cloud contact center platform, targeted at delivering rich, next-generation customer experiences. It's based on advanced cloud-native capabilities, and built from the ground up on a microservices architecture. This delivers elastic scalability, embedded Super Agent intelligence, an extensible desktop experience, and end-to-end embedded customer experience management and analytics. It's been built with digital-first, omni-channel in mind. Configurability is key, as we are rolling out

an advanced omni-channel contact flow builder that allows precision contact flows to be built with the ease of a drag-and-drop interface. Furthermore, we're establishing a rich set of APIs, starting with AI APIs for speech-to-text and transcription, followed by others such as sentiment analysts, data, media, and desktop APIs for tasks such as agent and queue statistics and control of channels.

### **The result: world-class experiences**

Our goal is to allow our customers to stay ahead of their customers' ever-increasing experience expectations. To enable our customers to be agile, we too must be agile. We've restructured our development teams to execute more quickly. We've implemented new change management processes and investments in our software factory to enable a faster and more continuous stream of new and enhanced capabilities, which resulted in our move from larger annual releases to continuous software delivery. This ultimately allows our customers deliver world-class digital experiences in the rapidly evolving customer experience landscape.



*Omar Tawakol  
VP/GM, Cisco Contact Center*

A man with a beard, wearing a black and white checkered shirt under a dark jacket, is looking down at a smartphone in his hands. He is standing outdoors with trees and a building in the background. The scene is lit with warm, golden light, suggesting late afternoon or early morning. An orange geometric shape is overlaid on the top left of the image, containing the title and author information.

# The Future of AI

*By Mohamed El-Geish*

*Director, Artificial Intelligence, Cisco Contact Center*

**The pursuit of doing more is as old as history can recall: technology has been playing** an important role in it from the very beginning. For example, in the ancient times, when people were just starting to explore the world, they were using their fingers to calculate. It was the first and the simplest way to calculate. However, every time they had to add or subtract, they had to keep track of the numbers. This became an issue when the numbers were getting bigger. So, they used sticks to count. However, this method was not efficient enough. Then, a new method came and it was called the abacus. It is a huge board, used by people to carry out counting operations. In the end, the abacus was replaced with the mechanical calculator. The mechanical calculator was a huge step forward because it could calculate more quickly. However, it was not perfect. A new invention came and it was called the computer. It was the best invention ever because it could do everything automatically. The computer was the best invention ever, but it still had some flaws. The first flaw was that it could not think for itself. The computer could only do what it was programmed to do. This was the end of the line and the beginning of a new one. We have now entered the era of Artificial Intelligence or AI. The use of AI is increasing every day and it has a great impact on the way we live.

You may have noticed a few oddities in the introductory paragraph above: For starters, I intentionally marked the first sixteen words in bold because that's all that I had to write as a prompt for my line of thinking — the rest is written by AI. This, in my opinion, is an epitome of human-AI collaboration: I was going to use the evolution of the wheel in my introduction; AI- assisted writing not only saved me

time but also improved upon the idea that I originally concocted. A human editorial touch is warranted to make the writing more stylistic; however, in this instance, I wanted to share with you the raw fruit of state-of-the-art AI as is. I think of AI in the enterprise and other substantial applications as Augmented Intelligence: **Humans are still in the driver's seat with their hands on the wheel, even if they are not always driving.**

Looking at what AI today has to offer in a plethora of domains, one can only wonder what the future holds. To make educated predictions about the future of AI, we need to **learn about its past, present, and rate of acceleration.** The past few decades have witnessed astronomical growth and improvements in three key ingredients that make AI extremely effective: digitization, computational power, and algorithms. The trio has been accelerating faster than ever before thanks to the increasingly innovative human capital that produces more efficient, more capable hardware and software by the day. We see this in the ubiquity of internet-connected devices and IoT; the abundance of AI accelerators in data centers and personal devices, and the hyper-growth of per-device and collective computational power. Moreover, we are witnessing a “gold rush” of research, funding, and talent in pursuit of advancing AI more than any other scientific field in present time.

Like other sufficiently complex technologies, AI technologies have been going through a hype cycle. The use of the plural form in the previous statement is intentional; **there are many facets and subfields of AI that are at different stages of the cycle.** For instance, let's predict how AI will overcome privacy challenges that stem from data collection and handling. Predominantly, AI scientists teach computers to recognize patterns in mappings (e.g., the mapping of an image to its caption); using tons of examples of such mappings, the machine then can predict the output for some input it has never seen before. This

technique is called supervised learning, and it requires human-curated data (supervision), which entails a myriad of human workers inspecting data — collected from various sources — to label for the machine. This approach may not raise any eyebrows when the data are images of wild animals; but how about photos on your phone or your tax return forms? Emergent approaches address such challenges by using encrypted data (homomorphic encryption); noisy, aggregate data (differential privacy); and requiring far fewer labeled examples (self-supervised learning) in order to teach machines to solve problems that typically entail supervised learning and full access to private data.

There are many other facets of how AI is developed and applied that will also have to evolve; such as quality management of AI systems (which are typically nondeterministic) and explicability of AI-made decisions in certain applications. The point is that **the more substantial the application is, the more mature AI is expected to be and the higher the expectations are.** That said, businesses cannot afford to wait until AI is fully mature to start utilizing AI solutions beyond a proof of concept; simply because human-AI relationships are cooperative and for them to mature, all involved parties require training. Imagine commanding medieval soldiers into the battlefield, fighting with cannons for the first time without proper training; just like these early cannons, AI technologies need to be battle-tested — in more than just a skirmish — to hone; nevertheless, they will still help you win against those who aren't equipped for the future of AI.



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## Customer experience – Hype vs. Hope

By Vinod Muthukrishnan

Chief Growth Officer, Cisco Contact Center

**Customer experience can loosely be defined as “how customers perceive their interactions with a company.”**

While this seems like a simple definition, the quest to understand, analyze and make good business decisions based on this basic explanation is where most businesses fail.

### **Customer experience: a single continuous journey**

Research shows that customer experience isn't a point in time, or merely “moments of truth.” Customer experience is comprised of one continuous journey – both individual transactions and those over a lifetime. It may not be the journey organizations wish for their customers, but it is the real journey customers live day in and day out—those which customers actually experience.

### **Key drivers of customer experience perception**

Among the experts, the consensus is three key drivers are emerging that define customer experience excellence. First, when engaging with an organization, can the customer successfully complete what they sought out to achieve? Second, what level of effort is required (otherwise known as ease), and finally, how they did they feel about going through the specific process. Success, effort, and emotion sum up the three vectors on which customer experience is delivered.

The higher goal with experience management is to move away from a world where decisions are made based on ad hoc surveys, anecdotal evidence, and small data sets. Customer experience is shifting to a realm where experience is viewed from the lens of the customer. The best way to evaluate experience is through the customer's eyes, or better said, to walk in the customer's shoes.

A proper evaluation of customer experience should involve re-creating and inspecting the customer's journey. Incenting teams within a company by KPIs that are not tied to customer experience limits their ability to have clear customer-focused alignment to guide their actions. Without KPI alignment, there will be a perpetual conflict between doing what is right for the customer versus what is right for the team or department.

### **Creating experience management excellence**

The first priority of experience management is to allow businesses to measure the pulse of customer sentiment along their entire journey. Gartner calls this "three forms of feedback" which include: direct, indirect, and inferred feedback. For a complete picture, organizations should have the ability to engage the customer with all three types of feedback mechanisms.

Next, we need to bring operational data into the journey. Throughout the duration of the journey, customers generate significant data: demographic data, transactional data, preference data and loyalty data. It's especially important to bring transactional or operational data into the customer journey. Bringing these two together creates an understanding

of the causal relationship between experience and transaction. This combination is considered the "holy grail" of customer experience management.

### **The movement towards preemptive, predictive analytics**

In experience management, a key trend is a movement away from a retrospective, postmortem mode to preemptive, predictive analytics - which allow businesses to create the future they want. The outcome of this must be very simple. It must be driven by a business imperative which can affect any highly quantifiable, tangible business outcome: movement of net promoter score (NPS), reduction in churn or improvement in the pre-trade purchase rate.

Therefore, the heart of customer experience, is to A) do it predictively and B) to strongly align with business outcomes that matter so customer experience is a profit center and a value driver in the business.

Contact centers, often the single largest company investment in customer experience, have a myopic view of customer experience. This manifests in a contact center that is unaware of the journey of the customer before they came to the contact center, and one which has no idea what happens to the customer after they leave the contact center. In addition, the contact center often has no data or analytics on the majority of customers who may never come to the contact center.

In total, contact centers are largely unaware of the current customer sentiment as it relates to their business – which is critical to delivering a great customer experience. The fact is, all of these

interactions generate analytics that can help better address resolution and may even help prevent a call from coming into the contact center in the first place!

Therefore, some organizations believe the ultimate goal for customer experience is for there to never be a need for a call to come into the contact center. Others are charting a new course, where the world of experience management and customer care come together to deliver a holistic customer experience along the entire journey. This is achieved by leveraging the power of journey analytics, orchestration, and predictive analytics. This combination gives businesses

the ability to drive predictive actions, which deliver the experience outcomes their customers deserve.

The future is not only interesting, it's predictive and preemptive!



*Vinod Muthukrishnan  
Chief Growth Officer  
Cisco Contact Center*

# When the Hype Isn't Hype: Why the Contact Center will matter more than ever

*By Zack Taylor, Director, Strategic Communications,  
Cisco Contact Center*

Forget what you know about the contact center. Forget the frustrating self-service menus. Forget reaching an agent that asks you to repeat everything you had just input. Forget contacting a company multiple times to address the same issue. Forget robotic service where agents are highly scripted. And most of all, forget avoiding contacting a company due to a poor experience.

The contact center is undergoing a fundamental shift driven by three factors. The destination is a new set of experiences, and the mechanism to get there is cloud.

First, and perhaps most obvious, is with shopping malls empty, health clinics now leveraging telemedicine, and most forms of person-to-person contact highly diminished during COVID-19, contact centers and eCommerce sites are the primary mechanisms that companies are engaging with their customers.

Second has been the massive shift to work at home contact center agents in 2020. While not a new paradigm – work at home for contact center agents being around for 15 years or more, is the fact that as much as 75% globally are now home based, up from 8-10% a year ago. This shift will afford companies to delivery better service, as home-based agents historically outperform brick and mortar agents. However, this shift comes with its challenges – in managing a massively distributed workforce. Contact Center agents will need greater connectivity to the rest of the enterprise value chain, and their managers will need new capabilities to manage these front-line employees.



Third, is the contact center is in the midst of establishing itself as a critical “exception” center in the enterprise. The rise of self-service in most business has afforded many repetitive and monotonous tasks to be automated – increasingly by solutions driven by underlying technology powered by AI. In this model, contacts that are left over after automation consists of critical “outliers” that cannot be automated. These outliers are significant risks to any brand, as they often represent the last bastion of opportunity a company has to save a customer from leaving the relationship. What is the only thing often standing between this event and a solution?

The contact center agent – a literal business “ambassador” – and at these junctures, more critical than the CEO, CFO, and CXO. Contact center agents will be required to be greater problem solvers, be more empathetic, and have the organizational latitude to extend retention offers to at-risk customers in real time. These are critical criteria as the contact center agent will often represent the ultimate destination where customer loyalty can be made or broken.

So where does this leave organizations dedicated to improving customer service and support experiences? There is a tremendous opportunity ahead to move the needle where stagnant customer experience scores are being experienced in most industries.

Even more important to recognize is experience expectations within an industry are likely being set from organizations outside your industry by category leaders whose products and services bear little resemblance to yours!

Expect on the road ahead that Hype Cycle capabilities listed in the “peak of inflated expectations” will move more quickly to practical utilization and business value – the “plateau of productivity”.

Cisco is investing in cloud capabilities to across the Hype Cycle to drive new customer experiences, and establishing a new category of contact center resources known as “Super Agents”. We already driving real time customer sentiment into the contact center. The sum total of these investments will establish contact centers that break free of long-standing constraints, taking their place in the enterprise finally as a strategic asset to be leveraged and not a cost center to be managed.



*Zack Taylor  
Director, Strategic  
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Center*

# The six essentials for the customer experience platform of the future

By Ryan Plant

Chief Technology Officer, Cisco Contact Center

At Cisco, we're beyond building the traditional contact center; we're building customer experience (CX) platforms. Enabling next-generation customer experiences requires a next-generation platform.

For years, contact centers have been dreaming of the possibilities that artificial intelligence and other disruptive technologies would have in reducing costs and streamlining operations – all of which hinge on the short-sighted prospect of taking the human element out of the experience. In reality, next-generation dreams of the contact center have resembled more of an asymptote – a constantly visible and deceptively approaching curve that is seemingly unreachable. One of the reasons, is that many of these next-generation capabilities are being force-fitted into legacy platforms that are closed, outdated, inefficient and inflexible.

Regardless of whether a technology or capability is hyped, in order to capitalize, a next-generation platform with the following six key attributes is required:

1. Open
2. Flexible
3. Accessible
4. Intelligent
5. Democratized
6. Secure



## 1. Open

Businesses of all sizes are only successful when they can grow and evolve and rapidly adjust to changing needs. As business moves faster, so too must the technologies that support them and it is unreasonable to expect any single provider to be responsive enough to furnish what it needs, when it needs it. A CX platform must enable and encourage an ecosystem of independent software vendors, system integrators, developers, and service providers and provide them the ability to create value-add revenue-generating solutions that meet the unique needs of their buyers and differentiate them from their competition. This is only possible if the CX platform is “programmatic”, in other words, a platform that is inherently open and extensible.

A programmatic platform is agnostic as to which solutions are developed and by whom. For example, if the contact center solution provides an agent desktop application, it should be built on the same APIs available to a partner or customer with the engineering wherewithal to do so; enabling them to enjoy the same privileges and support as if developed first party.

By providing an open and agnostic set of APIs – an approach we call “API-first”, the possibilities for innovation are limitless, enabling organizations across any industry to create completely new and unique functionality, as well as extended functionality that gives their business that leading edge and competitive advantage.

## 2. Flexible

A next-generation platform of any kind is one that is designed for the cloud and not just adapted to run in the cloud. Cloud-native platforms are those that deliver on the promises of seemingly limitless options of location, availability, capacity elasticity, and continuous streams of value delivery without costly and cumbersome upgrade cycles. With the rapidly changing landscape of customer experience, it is all the more critical that CX platforms provide the flexibility that only comes from being truly cloud native.

One of the principles of cloud-native architectures is to be agnostic to any particular cloud provider, public or private - enabling choice and flexibility when it comes to determining what locations the solution should be available. This is what is commonly known as the emerging trend of “multi-cloud” architecture. By supporting any cloud provider, the choice to run the solution in a region more desirable to the customer, can make all the difference from a performance, availability, and compliance standpoint.

In addition to multi-cloud, a cloud-native platform should be designed and implemented as a network of loosely-coupled, but highly cohesive units of discrete functionality – commonly known as microservices. One clear benefit of microservices is that it enables a CX platform to scale dynamically to ensure optimal service levels regardless of the volume of demand. A platform delivered in smaller packages also provides for a continuous stream of new capabilities without the traditional risks of disruptive, “Big Bang” releases or upgrades, enabling companies to choose when

and what capabilities they wish to expose to their customers which further offers the flexibility to use what is wanted and more importantly, to pay only for what is used.

### 3. Accessible

The current global pandemic has underscored the importance of operating a business with resiliency and without boundaries. Therefore, if the ecosystem surrounding the platform's functionality shouldn't have boundaries, and the CX platform shouldn't be restricted to provider or location, then the business and its customers should also not be limited.

A next-generation CX platform enables an ever-expanding and evolving set of mediums in which consumers can engage with the companies they have a relationship with, on any channel at any time. For consumers this means enjoying in-app experiences delivered natively to a mobile app or web browser. Likewise, the business should be equally empowered to provide superior service through the same means.

At its core, a CX platform should enable bi-directional and rich media engagement between consumers and the brand agents, regardless of location, device, app, or network. With the rise of reliable, global internet connectivity and open internet standards and protocols, there is no reason why a next-generation CX platform shouldn't enable business its ability to deliver world-class customer experience by both virtual (e.g. self-service) and human agents regardless of location or time.

### 4. Intelligent

There is no doubt that AI is an essential element in delivering current and next-generation customer experiences. However, the ultimate success of any AI initiative rests on the underlying data management platform and its ability to collect, store, process, and serve experience-enabling insight and intelligence in real-time. In short, the higher the quality and detail your platform can manage, the better the AI can be.

A next-generation CX platform must excel at managing data at cloud-scale and be adroit in converting raw data inputs into refined and enriched data outputs, that can be consumed by human and virtual agents alike, while enabling a virtuous loop of feedback and additional input for the continuous training and optimization for AI.

Businesses powered by next-generation data platforms have access to virtually unlimited history and detail related to customer service interactions. This is important for two reasons. First, it enables flexible reporting and advanced analytical solutions that can provide real-time operational insight and customer journey visualizations. Second, with the underlying repository of data, machine learning algorithms can be unleashed to create advanced AI applications that can enhance self-service capabilities such as improved natural language understanding and topic extraction as well as advanced agent assisting capabilities like suggesting next-best action based on customer journey analytics.

A true test of a next-generation CX platform is how it enables new and improved AI-powered solutions to be developed, trained, and optimized for not only better natural language understanding (NLU) capabilities used in virtual agents and agent assistants, but for truly autonomous customer experience orchestration.

## 5. Democratized

The difference between an excellent and mediocre customer experience comes down to the extent in which the business has been able to integrate disparate applications and data and leverage them within a cohesive customer service process. Traditionally the ability to do this required substantial investments in IT and software development resources to integrate systems and data together, with each change presenting demand for additional time and investment.

A next-generation CX platform leverages the openness of an API-enabled ecosystem and provides process modeling capabilities that empower non-IT or software development personnel to define, model, test, and deploy the next-generation of process automation also referred to as “orchestration”.

An orchestration capability consists of open access to sources of events, an extensible catalog of actions that can be triggered and executed by those events, and a no/low code modeling environment to test and immediately deploy automated processes or workflows.

In the context of a CX platform, this powerful orchestration capability can be used to declaratively engage information and activity sources of all kinds, such as order or customer account management systems, and use them to model complex service handling workflows that orchestrate interactions between consumers and both virtual and human agents, reducing average handle time (AHT) and increase first contact resolution (FCR).

An orchestration-empowering platform coupled with data management capabilities enhanced with deep learning algorithms will eventually enable customer experience workflows from being human devised and monitored to AI defined, modeled, tested, and deployed for minute-to-minute changes in the customer experience journey. Armed with this capability, businesses can democratize the responsibility of designing and continuously rolling out experience-enhancing automations that enable IT and software development resources to focus on other business-critical tasks.

## 6. Secure

In recent years, countless cases of security breaches and billions of dollars in damages have tarnished some of the most well-respected brands. Even the most trusted brands struggle to survive major security incidents involving the misuse or mishandling of the sensitive and sacred data of their customers.

Much like other characteristics described within a next-generation CX platform, a commitment to privacy and security must be inherent in the design and cannot be added later as an afterthought. Cloud solutions enjoy the benefits of ubiquity but with it comes exposure and risk, which can only be managed by adoption of the latest in privacy and security standards, architectures, and technology.

Open platforms and ecosystems that can operate across clouds and provide unprecedented access to consumers and agents must be protected end-to-end and inside and out from malicious access and data loss. Virtually every layer and microservice running within a next-generation CX platform stack should be hardened by AI-enriched intrusion detection systems and advanced cryptography to provide peace of mind to businesses and their customers, certifiable by the most stringent compliance and regulatory oversight possible.

Cisco is investing in next-generation CX. Over the coming months and years to come we plan to show that we are practicing what we're proverbially preaching as the essential elements of a CX platform of the future.



*By Ryan Plant  
Chief Technology Officer  
Cisco Contact Center*



Research from Gartner

# Hype Cycle for Customer Service and Support Technologies, 2020

Investments in customer service and support technologies must be scrutinized for their ability to deliver on customer experience goals, their impact on cash reserves and the likely speed of ROI. This Hype Cycle will help application leaders assess the maturity and risks of these technologies.

## Analysis

### What You Need to Know

The coronavirus pandemic and the resulting economic downturn have established a new set of priorities for customer experience (CX) decision makers, who include those responsible for customer service and support (CSS). Approaching the broad range of CSS technologies as an integrated ecosystem of functionality, rather than as a set of separate, compartmentalized systems (and associated decisions), enables organizations to deliver a more holistic CX. However, each investment must now be scrutinized in terms of its ability to deliver on CX goals, its impact on an organization's cash reserves and the likely speed of ROI.

By May 2020, the top five expected CX investments were in artificial intelligence (AI), the Internet of Things (IoT), customer analytics, CRM, and a single customer view or customer data platform. AI is a technology area that impacts a broad range of the entries in this Hype Cycle, as is customer analytics. By contrast, the IoT and CRM/customer engagement center systems and platforms focus on a more limited set of entries.

Application leaders responsible for CSS technologies who are looking for guidance about CX planning and investments should study this Hype Cycle to learn about, and assess, the maturity of relevant technologies.

For additional planning guidance, see “The Future of ...” series of Gartner documents on customer service and support technologies:

- “The Future of the Contact Center”
- “The Future of the Customer Engagement Center”
- “The Future of Customer Self-Service: The Digital Future Will Stall Without Customer-Led Automation”
- “The Future of Customer Service Analytics”
- “The Future of Customer Service Workforce Engagement Management”

## The Hype Cycle

This Hype Cycle is aimed at application leaders tasked with helping business units select and deploy CSS technologies of varying levels of maturity. It describes the most important technologies for supporting customers seeking answers, advice and solutions to problems. This support can be delivered through a variety of interaction channels and by enabling customer-facing employees to deliver advice and solutions. We determine how hyped and how mature the selected technologies are in the second half of 2020, as well as the business value they could provide. This Hype Cycle will help buyers have realistic expectations for these technologies.

Gartner categorizes CSS technologies according to the four pillars of customer service and support technology:

- **Getting connected:** This category focuses on delivering a channel-agnostic, architected design to create customer service journeys, including intelligent self-service. Technologies in this category include field service drones, AI-mediated communications, and augmented reality for customer support. Also in this category are consumer messaging applications, video calling for customer service, in-app mobile customer service, proactive communications applications and services, contact center as a service, and work-from-home agent technology.
- **Process orchestration:** This category supports increasingly complex and personalized customer engagements. Technologies in this category include blockchain for customer service, multiexperience, things as customers, digital experience platforms, customer engagement hub, natural language processing (NLP), chatbots, recorded video customer service, IoT for customer service, robotic process automation (RPA), virtual customer assistants and customer engagement center.
- **Resource management:** This category relates to the development and retention of engaged and empowered staff, based on the understanding that engaged employees power a stronger CX. Technologies in this category include workforce engagement management solutions, mobile field service management and field service workforce optimization.
- **Knowledge and insight:** This category concerns the delivery of customer and operational insights, and the recommendation of next best actions across all functional groups. Technologies in this category include emotion AI, customer psychographics, customer journey analytics, 360-degree view, customer service analytics, voice-of-the-customer solutions, knowledge management for customer service and speech analytics for customer service.

In addition to the removal of certain profiles (see the Off the Hype Cycle section below), this year's Hype Cycle features two noteworthy additions:

- A new entry for multiexperience.
- The return of work-from-home agent technology, following the massive wave of new adoption stemming from the coronavirus pandemic. This technology had previously been considered a mainstream technology that had graduated from the Hype Cycle.

## The Priority Matrix

Clients need to balance the transformational nature of some emerging technologies with their need for application technologies that can be used beneficially during the next two years, and for technologies that will take five years or more to mature.

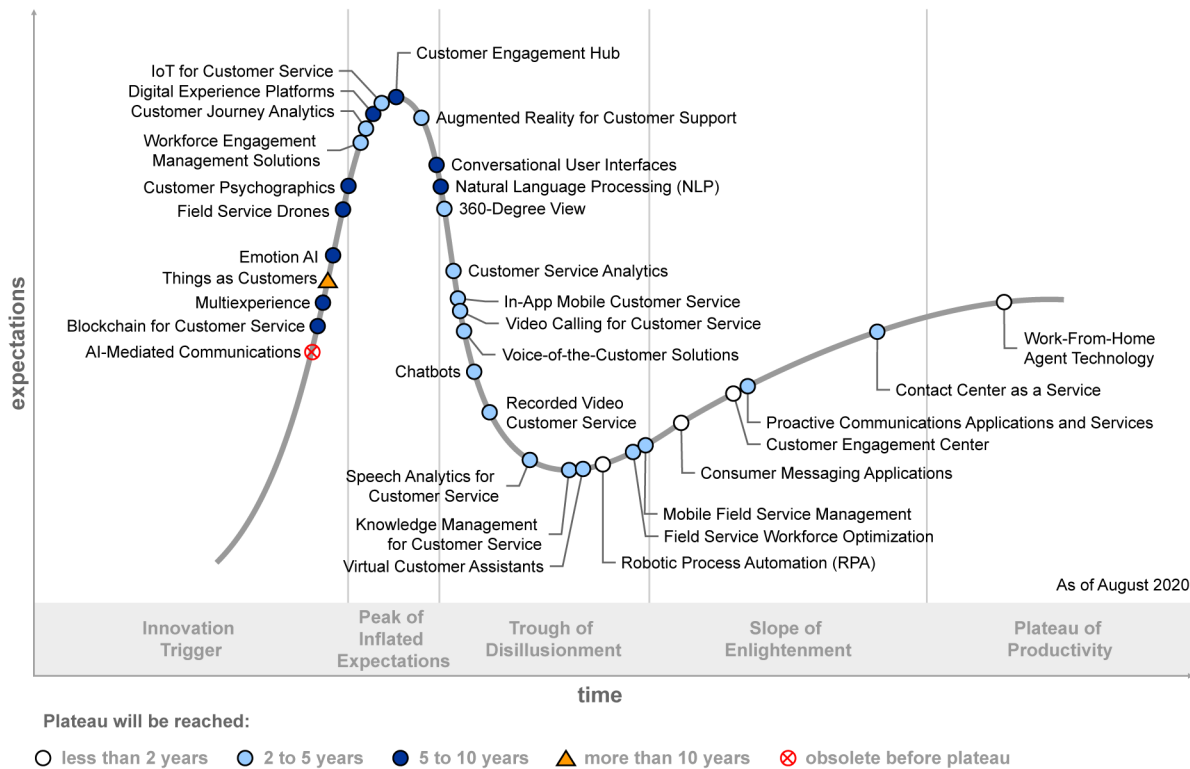
Consider your own organizational priorities in terms of benefits and timelines as you examine the Priority Matrix.

## Off the Hype Cycle

The following entries in "Hype Cycle for Customer Service and Support Technologies, 2019" do not appear in this edition of the Hype Cycle:

- Analytics for customer intelligence, which has been subsumed by customer service analytics.
- bpmPaaS, which has graduated from the Hype Cycle, having achieved mainstream adoption.
- Cloud-based customer engagement center, which has been renamed customer engagement center.

**Figure 1. Hype Cycle for Customer Service and Support Technologies. 2020**



**Figure 2. Priority Matrix for Customer Service and Support Technologies, 2020**

**Priority Matrix for Customer Service and Support Technologies, 2020**

benefit	years to mainstream adoption			
	less than two years	two to five years	five to 10 years	more than 10 years
transformational		Chatbots	Conversational User Interfaces Emotion AI Multiexperience Natural Language Processing (NLP)	
high	Customer Engagement Center Robotic Process Automation (RPA) Work-From-Home Agent Technology	360-Degree View Augmented Reality for Customer Support Customer Journey Analytics Customer Service Analytics Field Service Workforce Optimization In-App Mobile Customer Service IoT for Customer Service Knowledge Management for Customer Service Mobile Field Service Management Proactive Communications Applications and Services Recorded Video Customer Service Speech Analytics for Customer Service Video Calling for Customer Service Virtual Customer Assistants Voice-of-the-Customer Solutions Workforce Engagement Management Solutions	Blockchain for Customer Service Customer Engagement Hub Digital Experience Platforms	Things as Customers
moderate	Consumer Messaging Applications	Contact Center as a Service	Customer Psychographics Field Service Drones	
low				

As of August 2020

Source: Gartner  
ID: 463595

- Emotion detection/recognition, which has been replaced by emotion AI.
- Mediated interaction matching, which has been renamed AI-mediated communications to reflect the impact of AI and broader application of the underlying technology.

## On the Rise

### AI-Mediated Communications

**Analysis By:** Steve Blood

**Definition:** AI-mediated communications (AI-MC) applied to customer services is an approach for managing interactions between customer and employees using predictive, AI-assisted routing. AI-MC uses a combination of behavioral analytics, personality and predictive modeling to orchestrate interactions between customers and advisors. Matching customers to advisors, based on factors such as personality, is shown to improve customer satisfaction and lower average handling time.

**Position and Adoption Speed Justification:** AI-MC (formerly mediated interaction matching) is a niche but important component of “orchestrating interactions,” one of the four pillars of great customer service. An increased focus on behavioral analytics, which is associated with marketing as well as managing customer interactions across all channels, is expected to drive greater adoption of AI-mediated communications. The adoption of AI-MC, however, is challenged, especially in the phone channel. The queuing theory principles for the contact center are mature and well-understood concepts that have been used for the past 30 years. Few organizations want to radically change their approaches to contact management for fear of disrupting the process and service level. Consequently, AI-MC is viewed as influencing routing methodologies with personalization capabilities. It can be tested by organizations looking

to enhance contact between groups of customers and employees, or by those looking to differentiate their value proposition with digital customer services. We expect AI-MC to be leveraged in tools such as skills-based routing, analytics and presence — to achieve the best match between customer and employee or self-service platform. It can also help in improving the overall trust between and a supplier in digital engagements. Predicting how organizations should engage with customers on a personalized level is increasingly likely to be consolidated as part of customer journey analytics.

**User Advice:** Application leaders for customer service technology should evaluate new ways of combining predictive, multichannel customer service with improved self-service capabilities and customer journey analytics. This will help improve the overall customer experience and enable customer service managers to develop pilot groups to test new ideas and operating models. Broader alignment of the contact center with digital workplace initiatives will enable AI-MC to leverage the presence status of employees — for timely distribution of work — without necessarily having to increase the size of the existing contact center. AI-MC will work best in organizations that adopt an employee-surplus model, rather than a customer-surplus model, for managing customer service interactions.

Improvements in managing phone calls have to be balanced with the investment needed to better manage the growth of engagement in digital channels, where customer satisfaction is higher. Organizations with very large call center environments should consider AI-MC as a legitimate way of improving customer satisfaction. An effort-benefit analysis, such as implementation of speech analytics, customer journey analytics and voice of the customer, should be conducted for this and other initiatives to improve customer satisfaction. Consider aligning AI-MC with behavioral analytics, which are emerging in

multichannel marketing hubs, as another way of targeting customer communication.

**Business Impact:** Matching the personalities of customers and employees has been proven to reduce contact resolution duration and improve customer satisfaction. Many organizations monitor and measure their staff for quality of interaction, including compliance with company policies, but profiling customers and matching to employees is a level of personalization which has yet to be commonly accepted. AI-MC most likely will be used initially in the customer service center. However, with tools such as presence being more broadly adopted as part of digital workplace, the opportunity to use AI-MC principles for customer contact management could be a primary contributor to differentiating customer service quality across a multichannel environment.

**Benefit Rating:** High

**Market Penetration:** 1% to 5% of target audience

**Maturity:** Emerging

**Sample Vendors:** Afiniti; NICE; Optimove; whenwhyhow

## Blockchain for Customer Service

**Analysis By:** Nadine LeBlanc

**Definition:** For customer service, blockchain technologies focus on enabling multienterprise collaboration and/or transactions that help to build trust and transparencies in a low-trust environment. Blockchain technologies serve as new complementary record management systems beyond organizational boundaries, including digital assets such as contracts, health records, transcripts or IoT devices.

**Position and Adoption Speed Justification:** Most organizations are still learning about the potential uses

of blockchain for customer interactions. Corporate innovation with blockchain is stalling as organizations are facing challenges such as how to govern through consortia and establishing common processes and data standards. As blockchain technologies continue to mature, customer service use cases will expand to include customer onboarding, problem diagnosis, coordinated deliveries, customer surveys, asset tracking, warranty management, dispute resolution and consent management. Customer service use cases are often a common thread across blockchain early adopters. Early adopters include financial services, government, healthcare, education, manufacturing and utilities organizations.

Blockchain technology vendors have shown progress in supporting customer service during the past two years. Vendor offerings are being released, but are still limited in scope, with a primary focus on building consortium and communities. A submarket of decentralized applications (dapps) and applications accessing distributed ledger enables organizations to collaborate and transact for customer service. In addition, mega-CRM vendors such as Microsoft, IBM, SAP, Oracle and more recently Salesforce are expanding their offering with blockchain.

Blockchain for customer service will be only the beginning in addressing the advanced security and protection concerns all customers will demand of enterprises. The idea of an ecosystem working as a whole to enable data sharing and reduce the burden of preserving privacy could be part of the answer to more-stringent data privacy legislation. While the current generation of blockchain doesn't support several privacy requirements, we see R&D effort to solve challenges such as data location and immutability. In addition, programmable behavior and applications can be added to enhance the customer experience, decrease costs and give rise to new customer service models.

The commercialization of blockchain technologies for applications and platforms is at an early stage. Issues of scalability, security, and adherence to existing legal, regulatory and compliance standards will need to be resolved prior to seeing major commercial applications in customer service. Current implementations of blockchain technology are more often than not accompanied by trial-and-error efforts or small pilots.

**User Advice:** Application leaders and CIOs responsible for CRM and customer experience should:

- Experiment with small-scale implementations in the next two years. If one of your technology providers offers blockchain as a service or blockchain technologies, take the opportunity to raise awareness and increase knowledge and skills around the application of blockchain.
- Explore private, consortium and public technology frameworks as a way to decentralize your organization's customer experience. Be prepared to incur migration costs until the technology matures.
- Investigate the security and privacy risks of blockchain technologies, such as the implications of handling personal customer data with blockchain technology, and the risk of unauthorized disclosures to public and/or other consortium participants or partners.
- Consider blockchain's applicability in promoting data minimization and serving as a technology to support compliance activities. Focus on placing control over personal data into customers' hands via self-service features in order to emphasize and promote trust.

**Business Impact:** Blockchain-based disruption can optimize and, in certain cases, transform the way organizations deliver services and engage with their

customers beyond the organization's boundaries. Because a blockchain can help implement trust mechanisms in untrusted environments, it allows competitors and organizations of all sizes to benefit from it. It is the digital ecosystem itself that provides the most benefits.

The benefits associated with the usage of blockchain technologies include:

- Enhanced customer experience and efficiencies by supporting seamless, frictionless multiparty customer service.
- Increased accuracy and scope of proactive and predictive customer service, such as identity management, proof of ownership, or proof of sequence of events.
- Reduction in the cost of data management, such as cross-check, reconciliation or storage, and cost of service, such as customer onboarding efficiencies or smart alerts.
- Blockchain technology, an infrastructure supporting dapps, is still immature, but accelerating interest in it, early adopters and its nascent ecosystems could become catalysts for better business processes, including customer service. Gartner predicts that, by 2023, 10% of large organizations will join a blockchain consortium with the specific purpose of improving their level of customer service.

**Benefit Rating:** High

**Market Penetration:** 1% to 5% of target audience

**Maturity:** Emerging

**Sample Vendors:** Colu; Gliding Eagle; IBM; Loyyal; Lumeos; Microsoft; Oracle; QEDIT; SAP; Warranteer

## Multiexperience

**Analysis By:** Jason Wong

**Definition:** Multiexperience describes the interactions across a variety of digital touchpoints (e.g., web, mobile apps, chatbots, AR/VR, wearables), using a combination of interaction modalities (e.g., no-touch, voice, vision, gesture) in support of seamless and consistent digital user journeys. Multiexperience is part of a long-term shift from computers as individual devices we use to a multidevice, multisensory and multilocation environment we experience.

**Position and Adoption Speed Justification:** Through 2030, the user experience (UX) will undergo a significant shift in terms of how users experience the digital world. Web and mobile apps are already commonplace, but they are undergoing UX changes driven by new capabilities like progressive web apps, WebXR and AI services. Conversational platforms allow people to interact more naturally and effortlessly with the digital world. Virtual reality (VR), augmented reality (AR) and mixed reality (MR) are changing the way people perceive the digital world. This combined shift in both perception and interaction models leads to the future multisensory, multidevice and multitouchpoint experience. Having the ability to communicate with users across many human senses will provide a richer environment for delivering nuanced information.

The long-term manifestation of multiexperience (MX) is a unified digital experience that is seamless, collaborative, consistent, personalized and ambient. This will happen over the next five years — and is already accelerated by the COVID-19 pandemic, which has increased reliance in digital touchpoints. Privacy concerns in particular, may dampen the enthusiasm and impact of adoption. On the technical front, the long life cycles of many consumer devices and the complexity of having many creators developing elements independently, will be enormous barriers

to seamless integration. Don't expect automatic plug and play of off-the-shelf devices, applications and services. Instead, proprietary ecosystems of devices will exist in the near term. Focus on understanding how unified digital experiences impact the business and use evolving multiexperience technologies to create targeted solutions for customers or internal constituencies.

**User Advice:** Application leaders should:

- Identify three to five high-value proof-of-concept projects in which multiexperience design can lead to more compelling and transformative experiences.
- Use personas and journey mapping to address the requirements of diverse enterprise use cases, including external-facing and internal-facing scenarios to support a unified digital experience.
- Collaborate with marketing/branding to educate the UX team on the brand strategy and identity; ensure UX teams accurately apply visual, behavioral and written guidelines across all relevant multiexperience touchpoints and modalities.
- Establish a multidisciplinary core team potentially including but not limited to IT, business leadership, HR, facilities management, UX, experience design and product.

**Business Impact:** Organizations are shifting their delivery models from projects to products, but beyond products is the experience — the collection of feelings, emotions and memories. Understanding and exploiting multiexperience is essential to the effectiveness of customer experience (CX), employee experience (EX) and UX strategies. Multiexperience starts with a mindset to remove friction and effort for the users — internal or external — through the contextual

use of digital technologies. Adopting this mentality will allow application leaders to better align with business objectives and be more agile at delivering positive business outcomes. When CX, EX, UX and MX strategies are executed with one another in harmony and synchronicity, you can deliver transformative and memorable experiences for customers, employees and all users of your digital products and services.

**Benefit Rating:** Transformational

**Market Penetration:** 1% to 5% of target audience

**Maturity:** Emerging

## Things as Customers

**Analysis By:** Don Scheibenreif; Mark Raskino

**Definition:** A thing (or machine) customer is a nonhuman economic actor that obtains goods or services in exchange for payment. Examples include virtual personal assistants, smart appliances, connected cars and IoT-enabled factory equipment. These thing customers act on behalf of a human customer or organization.

**Position and Adoption Speed Justification:** Today there are more internet-connected machines with the potential to act as customers than humans on the planet. We expect the number of machines and ambient artificial intelligence (AI), like virtual personal assistants, with this capability to rise steadily over time. They are increasingly gaining the capacity to buy, sell and request service. Things as customers start simply by alerting human counterparts that they need attention. However, things will advance beyond the role of simple informers to advisors and, ultimately, decision makers. According to Gartner research, both CEOs and CIOs agree on the potential of this emerging trend. Forty-nine percent of CIOs and 25% of CEOs we surveyed in 2019 believe demand from machine customers will become significant in their industry

by 2030. These leaders believe at least 25% of all consumer purchases and business replenishment requests on average will be delegated to machines. Today, most things simply inform or make simple recommendations. We do see some examples of things as more complex customers emerging, such as smart grid technologies. HP Inc. embraced this future when it created Instant Ink — a service that already enables connected printers to automatically order their own ink when supplies run low. Some Tesla cars already order their own spare parts, and Walmart has patented grocery autoreordering based in home IoT sensing. In B2B, U.S.-based industrial supply company Fastenal uses smart vending machines that proactively place orders when stocks run low. Thinking forward, an autonomous vehicle could determine what parking garage to take its human passengers to based on criteria such as distance from destination, price, online review score, parking space dimensions, valet options, etc. In this case, it is the parking garage marketing to the car, not the humans.

This is a long-term proposition and there are major barriers, hence the early position on the Hype Cycle. The largest barrier is trust. Can the human customer trust the technology to accurately predict and execute? And, can the machine customer trust the organization that offers the service? Other barriers include: complex AI technologies, security and risk, regulatory compliance issues, and data sharing. All this will mean that things as customers across industries will not reach the Plateau of Productivity for five to 10 years.

**User Advice:** We recommend the following:

- Create a “tiger team” of architects, engineers, data scientists, economists, linguists, psychologists, and business decision makers to explore the business implications of machine customers. Determine whether the enterprise has the right capabilities, processes, and systems to identify, serve, communicate, and take orders from machines as customers.

- Follow examples from organizations like Tesla, Google, Amazon and Caterpillar to look for evidence of capabilities and business model impact.
- Build your organization's capabilities around artificial intelligence over the next five years. First in machine learning, then extending to other facets involved in machine customers processing information and making informed decisions.
- Identify use cases where your products and services can be extended to thing customers and pilot those ideas to understand the technologies, processes and skills required. Start with simple use cases driven by rules that can be easily configured and controlled by customers.
- Create scenarios to explore the market opportunities. Initiate collaboration with your chief digital officer, chief data officer, chief strategy officer, sales leaders, chief customer officers and others to explore the business potential of machines as your customers.
- Be mindful of the very real barriers. The complexity involved in developing a thing customer that can learn the depth and breadth of knowledge and preference trade-offs required to act on behalf of a human customer in a variety of situations is complex. Some humans may initially be uneasy about delegating purchasing functions to machines. Consider what ethical standards, legal issues and risk mitigation are needed to operate in a world of machines as customers.

**Business Impact:** Over time, trillions of dollars will be in the hands of nonhuman customers. This will result in new opportunities for revenue, efficiencies and managing customer relationships. Digital-savvy business leaders seeking new growth horizons will need to reimagine both their operating models and

business models to take advantage of this ultimate emerging market, whose numbers will dwarf the number of human customers on (and one day perhaps off) the planet. How do you sell to a thing? What will get a thing to buy from you when its decisions are based on algorithms, not emotion? How will your human customer service agents handle requests from millions of things? What does "customer experience" even mean for a thing? Things as customers have the potential to generate new revenue opportunities, improve productivity, increase operational efficiency, improve health/well-being and enhance security of physical assets and people. They will also result in new sources of competition, fraud, legal and taxation challenges, and operational challenges (like how to provide customer service for things).

**Benefit Rating:** High

**Market Penetration:** Less than 1% of target audience

**Maturity:** Emerging

**Sample Vendors:** Amazon; AutoCrib; Caterpillar; Google; Tesla

## Emotion AI

**Analysis By:** Annette Zimmermann

**Definition:** Emotion artificial intelligence (AI) technologies (also called affective computing) use AI to analyze the emotional state of a user (via computer vision, audio/voice input, sensors and/or software logic). It can initiate responses by performing specific, personalized actions to fit the mood of the customer.

**Position and Adoption Speed Justification:** One of the benefits of detecting emotions/states is for a system to act more sympathetically. It creates anthropomorphic qualities for personal assistant robots (PARs), making them appear more "human." This "emotional capability" is an important element

in enhancing the communication and interaction between users and a PAR. People's daily behavior, communication and decisions are based on emotions — our nonverbal responses in a one-on-one communication are an inseparable element from our dialogues and need to be considered in the human-machine interface (HMI) concept.

The first step in detecting human emotions is to define the different types of emotions, from angry, sad, happy and insecure. AI is a critical part of some, although not all, emotion AI solutions. Computer vision (CV)-based emotion AI requires a collection of imaging/video data and preparing it to be fed into an artificial neural network (ANN). Vendors using CV technology to detect emotions primarily apply convolutional neural networks (CNNs), a deep-learning technique.

Several new commercial deployments occurred in 2019 for emotion AI and new vendors entered the market. At the same time, we did not see any evidence for great advancements in technological capabilities. Therefore, the position of this profile on the Hype Cycle was stagnant.

There are several vendors, including Beyond Verbal, audEERING and Intelligent Voice, that have developed emotion AI systems based on audio analysis. Phonetic attributes and the understanding of words do not play a primary role here, and the most sophisticated systems are completely language-agnostic, including tonal languages. Vendors have developed algorithms that attribute the different pieces of sound waves to emotional states. The main type of neural networks (NNs) used for audio-based emotion AI are recurrent neural networks (RNNs).

Data quality (lab-based versus real-life data) and machine learning (ML) techniques determine the reliability of the technology to detect emotions. The better the data and the more data there is, the higher

the probability of detecting different nuances of human emotions. Combinations of CV-based, audio-based and sensor-supported technologies make sense in certain use cases, but is not always required to gain a better result.

**User Advice:** As the market is currently very immature, most vendors are focused on two or three use cases in two or three industries. Hence, when selecting a vendor, it is important to review their capabilities and reference cases. As discussed above, the context and environment of the use case will determine the type of emotion AI to be used. Organizations should make lists of use cases that apply to them.

- Be use-case-driven. The use case will determine the emotion AI technology to be used and vendor selection.
- Appoint responsibility for data privacy in your organization, a chief data privacy officer or equivalent.
- Work with your vendor on change management in order to avoid user backlash due to sensitive data being collected.

At the same time, identifying and processing human emotion is currently a gray area, especially in the EU. The EU Commission has started an initiative to review the ethical aspects of AI technologies, and emotion AI will certainly be part of this debate.

**Business Impact:** Emotion AI technologies have already been adopted by various business functions in different industries, including call centers, PARs and high-end cars. CV-based emotion AI has already been used for more than a decade in market research — testing how consumers react to products and commercials. For about two years, many vendors have moved into completely new industries and use cases such as automotive, robotics, medical diagnostics, education and the public sector.

- Insurance companies are using audio-based emotion AI for fraud detection.
- In call centers, voice-based emotion AI can be used for intelligent routing for a better customer experience.
- Software exists that helps physicians with diagnosing depression and dementia.
- Dubai's Road and Transport Authority (RTA) announced the use of CV-based emotion recognition in four of its "customer happiness centers." When the "happiness level" among visitors drops below a certain threshold (maybe due to long queues) employees are notified and can act upon it.
- Inside the car, audio and CV-based emotion AI helps to understand what is going on and detects whether passengers are emotionally distracted.
- In retail, stores are adopting camera-based facial and emotional recognition to understand demographics and moods of visitors, enhancing the retail experience. Similar trends are emerging in the hospitality industry (in hotel lobbies) where cameras are used to recognize frequent guests and recognize their emotions.
- In education, we have seen prototypes of learning software that adapts to the user's emotional state. Another opportunity is in training and workshops, where emotions of the training participants are captured to see how they are experiencing the training.

**Benefit Rating:** Transformational

**Market Penetration:** Less than 1% of target audience

**Maturity:** Emerging

**Sample Vendors:** audEERING; Affectiva; Behavioral Signals; Eyuris; Google; Intelligent Voice; Microsoft; Voicesense

## Field Service Drones

**Analysis By:** Jim Robinson

**Definition:** Drones for field service are portable, unmanned aerial vehicles remotely controlled by human pilots on the ground or outfitted to navigate autonomously, typically carrying cameras and sensors that can collect datasets for analysis. Some drones can be used to transport parts or tools, depending on regulations and mission parameters. Machine learning and algorithmic decision-making capabilities enable field service drones to make mission corrections/alterations autonomously and collect additional data in response to conditions.

**Position and Adoption Speed Justification:** Drones are being evaluated to serve as the "eyes" of field service organizations that:

- Require firsthand visual data to inspect equipment in remote or dangerous locations (such as pipelines and wind turbines)
- Need to see physical obstructions that are causing problems with function (such as a fallen tree on a power line)
- Service equipment that can only share data via short-range wireless data transfer

The traditional field service approach resulted in:

- Safety risks (for example, when technicians climb high towers in poor weather conditions)
- Expensive-to-use equipment (such as helicopters, cranes or bucket trucks)

- Travel time (to reach an observation point to perform inspections or troubleshooting)
- Multiple technicians on hand (to observe and protect the primary technician)
- Organizations also are exploring more nascent opportunities to improve equipment uptime by:
  - Analyzing video data or equipment telemetry to proactively identify issues or predict outages
  - Transporting replacement parts to places where road conditions are a factor

Some pilot drone project results show significant potential, particularly when it comes to the number of inspections that can be performed and the relative safety of related tasks such as taking pictures. But field service drones will take at least five years to reach plateau. Organizations — especially in inspection-heavy industries such as real estate, government, utilities and insurance — are still driving vendors to improve battery life, enhance AI-based machine vision capabilities and await aviation, safety and other regulations (such as “beyond visual line of sight”) that define how extensively drones can be used.

**User Advice:** Application leaders in field service organizations should build awareness about field service drone capabilities among field service department leadership. In addition to their well-known ability to travel into areas only accessible through flight, drones’ other functions also present potential. These include remote control, autonomous or mission-defined flight, communications, thermal or night vision sensors, pattern recognition, durability, cost, weather resistance, and potential integration to other systems such as predictive analytics, geographic information systems and schedule optimization.

Application leaders should work with field service leaders to develop a low-cost proof of concept, starting with job types that are currently performed by technicians or crews where utilizing a drone as part of the toolset could improve safety or efficiency. Identify which of the above features will be needed. Also, determine how regulatory factors, such as altitude, speed and total weight including cargo, impact the opportunity. Search the internet for information about rapidly changing local regulations such as bans, restrictions, special permits or certification requirements for activities such as flying beyond visual line of site (BVLOS), flying over people, at night and in restricted airspace.

**Business Impact:** As more organizations experiment with field service drones and as they are recognized as another means to reduce human-to-human contact they will be used more and more, especially as other industries use unmanned aerial vehicles (UAVs) more and more. Tests indicate that the cadence with which inspections may be performed could more than double in some use cases. This will depend on the nature of the inspection work, level of autonomy and regulatory impact. As AI-driven capabilities to autonomously capture, analyze and act on sensory data such as machine vision and thermal detection improve, drones will move beyond the “picture taker” role and ROI potential will increase. Parts deliveries could happen much more quickly, especially if poor road conditions are a factor for deliveries today. Other areas, such as lone worker observation, security and internet access, will also provide the benefits of technician satisfaction, safety, customer satisfaction and profitability.

**Benefit Rating:** Moderate

**Market Penetration:** 1% to 5% of target audience

**Maturity:** Emerging

**Sample Vendors:** Airobotics; Cyberhawk; DJI; PrecisionHawk

## Customer Psychographics

**Analysis By:** Gareth Herschel; David Pidsley

**Definition:** Customer psychographics is the study and classification of product and service users according to their attitudes, communication style or decision-making style, rather than their specific actions, requirements, profitability or levels of satisfaction. Users are matched to predefined styles, or personality preferences, based on directly captured data (e.g., social media comments, user-generated images and video, audio calls) or on data derived from analysis of behaviors (e.g., purchasing products with a consistent set of attributes).

**Position and Adoption Speed Justification:** Although academic literature about personality profiles has been around for decades (the well-known Myers-Briggs Type Indicator test dates from the 1920s), the ability to automatically interpret customer behavior consistently and accurately has only become feasible more recently.

The supporting evidence base has matured along with the enabling technologies, for example, Stanford researchers found that computers can judge personality traits more accurately than one's friends and colleagues. Given suitable data, in this case social media "likes," an algorithm was better able to predict a person's personality traits than any of the human participants. It needed little data to outperform a work colleague (10 likes), roommate (70), parent or sibling (150), spouse (300).

Capabilities have outpaced awareness of how this concept might be applied, and the willingness to use it ahead of other, more traditional ways of segmenting and understanding customers (for example, those based on demographic profiles or transaction histories).

As organizations identify use cases for this type of analysis, the existing maturity of the technology should enable swift adoption and the move to productivity.

**User Advice:** Organizations seeking to differentiate the customer experience rely on segmentation. Demographics explain "who" your buyer is, while psychographics explain "why" they buy. There are various types of segmentation, of which psychographics is just one. This type of segmentation can be applied in two ways:

- When a customer's product requirements are not clear, but there is an opportunity to engage them at an emotional level.
- When the reason that someone acts is as relevant to the relationship as what that person actually does. One example is whether a person buys an expensive watch as a social signal or because they view it as a prudent investment.

Different approaches to customer psychographics will be suitable in different circumstances (for example, communication style analysis may be helpful in a call center, while attitudes to risk or convenience may be more suitable for product recommendations). The variety of domains and techniques that will apply this concept is likely to diversify, leading to a situation where different technologies are, effectively, at different levels of maturity. This will depend on the use case and how different technologies or methodologies compete for relevance in the same use case.

**Business Impact:** Consider the following impact areas:

- Service centers are using this technique to reduce handling time — whether that be average handle time (AHT) or average talk time (ATT). They also use it to increase first-contact resolution (FCR) rates by routing the customer to an agent who they will "get on with," due to a personality match.

- Sales environments are using this technique to align salespeople with customers or prospects, resulting in increased sales conversion rates.
- Marketing organizations are using this technique to refine their target marketing audiences and messaging.
- Human resources team are using this technique for matching customers to psychographically suitable sales and support representatives and for recruitment marketing, gender bias analysis, and to support culture change in digital transformation communications.

**Benefit Rating:** Moderate

**Market Penetration:** 1% to 5% of target audience

**Maturity:** Adolescent

**Sample Vendors:** CaliberMind; Crystal; HireVue; IBM Watson; MATTR; Neosperience; NICE; Receptiviti; Textio

## At the Peak

### Workforce Engagement Management Solutions

**Analysis By:** Jim Davies

**Definition:** Workforce engagement management (WEM) solutions expand on the already mature workforce optimization (WFO) market by also accommodating technologies — such as interaction assistance and voice of the employee (VoE) — that help drive employee engagement within the customer service department. The core WFO component is the result of the unification of quality monitoring, workforce management, e-learning, performance management and speech analytics tools, which have helped drive operational performance over the past decade.

**Position and Adoption Speed Justification:** WEM is a concept that most WFO vendors are only now coming to terms with. The majority of end-user organizations still view investment in these platforms as a means to drive operational performance. This objective will not diminish during future procurement cycles but will become a “given.” The benefits of deploying an integrated suite with strong core functionality and cross-functional workflows will not need to be explained, nor will it continue to be a means of differentiation in the long term. Instead, the need to drive employee engagement will become an increasingly important factor and a key means of innovation and differentiation for the vendors in this market during the next few years. Functionality that assists the employee throughout their day and in individual interactions, combined with a stronger ability to listen to employees, will be at the heart of much of this new functionality.

All vendors have extensive roadmaps to change the nature of their rather cumbersome WFO solutions to become more agile and employee-focused WEM solutions. Some vendors have a head start in this change, but more investment is needed by everyone.

A key aspect overlooked with WFO is the notion of thinking about the employee outside of the office environment. When looking at the world from the point of view of an employee, myriad functional opportunities reveal themselves. For example, the ability to support “commute-based coaching” — employee training over a phone or tablet while on the way to work, freeing up their learning break that day for personal time — has not yet been considered by any vendor.

**User Advice:** The majority of end-user organizations still view investment in WEM as a means to drive operational performance. However, organizations should also begin to:

- Determine the likely change to the expectations of their future workforce in their specific industry and geography.
- Prove the correlation between how engaged an employee is and the experience they subsequently provide to customers through targeted metrics.
- Map out how to embrace a WEM strategy that leverages their current WFO functions.
- Invest in appropriate desktop tools that complement CRM and assist the agent.
- Add a robust VoE program to their contact center operations.

**Business Impact:** A WFO solution primarily affects the customer engagement center by delivering efficiency and effectiveness gains. The extension of this to WEM not only helps improve operational performance but also elevates employee engagement. As societal shifts begin to force a change in how contact center managers handle their workforce, traditional operational management techniques will increasingly fail over the next few years. A shift of focus to employee engagement is essential to ensure employee loyalty and elevated customer experiences.

**Benefit Rating:** High

**Market Penetration:** 1% to 5% of target audience

**Maturity:** Adolescent

**Sample Vendors:** Aspect Software; Calabrio; Genesys; Jacada; NICE; Verint Systems; WalkMe; ZOOM International

## Customer Journey Analytics

**Analysis By:** Jason Daigler; Lizzy Foo Kune

**Definition:** Customer journey analytics (CJA) is the process to track and analyze the way customers and prospects use a combination of available channels to interact with an organization over time. It covers all channels the customer has used, including those with human interaction (such as a call center), those that are fully automated (a website), those that provide assisted help to the customer (live chat and co-browsing), those that are operated in physical locations (a retail store) and those with a limited two-way interaction (advertising).

**Position and Adoption Speed Justification:** Customer journey analytics is a strategic priority for a variety of internal roles in several different industries, as application leaders and marketing leaders strive to gain a better understanding of customer acquisition, retention, satisfaction, advocacy and loyalty. In many cases, CJA initiatives begin as projects to create customer journey maps, which are snapshots of customer experiences for a given process. Often, organizations begin by manually mapping their perception of the customer journey without using data and analytics to track and measure journeys. For journey maps to become both more accurate and dynamic, organizations will ultimately need to power the journey maps with actual data. Without a clear strategy for capturing and linking the right data in each channel, organizations will lack a true understanding of the customer journey, beyond interactions wherein the customer is forced to reveal their identity.

CJA is accelerating in adoption as more applications begin to add elements of journey analysis into existing tools, such as customer data platforms, personalization engines, customer analytics applications, and multichannel marketing hubs.

**User Advice:** Customers hop from channel to channel over time, and as such organizations should not assume that continual investment in understanding

customer behavior within a single channel will deliver more valuable insights than understanding the combination of channels they use. Similarly, organizations should be wary of key performance indicators (KPIs) that fail to consider the implications of customer activities in other channels, such as single-channel conversion rates. Starting with customer identification and journey mapping across only two to three channels, where data is both available and valuable, is an excellent way to start with CJA. The selected journey should also be one that is valuable to both the organization and the customer. Similarly, starting by manually mapping the internal perception of customer journeys is a reasonable starting point, as long as organizations intend to eventually validate the mapped journey with data and analytics. Organizations should also consider how they can orchestrate and automate journeys based on the insight gained from CJA; this will necessitate integrating CJA solutions, and specifically their outputs, into other internal systems.

As stated above, journey analysis functionality is becoming more frequently embedded into other systems, so organizations should evaluate their existing technology stack to see if they're already paying for an application with journey analysis capabilities.

**Business Impact:** Organizations can obtain the following benefits from CJA:

- Higher customer satisfaction from more seamless and personalized interactions across channels.
- Better understanding of the benefits that each interaction delivers to the overall journey, resulting in better allocation of investment to supporting the overall relationship.
- Improved understanding of the interrelationships between different parts of the journey, allowing organizations to, for example, evaluate the expectations that are set in the beginning of a journey with the outcomes toward the end of a journey.
- The ability to diagnose pain points in the customer journey across channels to aid business prioritization of CX projects.
- More accurate customer segments, based on data from multiple channels as well as real-time data and predictive modeling, thereby increasing the effectiveness of marketing campaigns.
- More successful personalization tactics — whether on commerce sites, communication channels or elsewhere in the customer experience — based on data that gives a more complete view of the customer's activity in multiple channels instead of a single channel.
- More relevant and efficient customer service for customer-facing agents who have a more complete view of the customer's activities and difficulties, based on data from multiple channels.
- More effective marketing, allowing media channels to be an extension of customer communications.
- Improved customer experience and reduced customer churn through real-time next best actions orchestrated by insight gleaned from customer activity.

**Benefit Rating:** High

**Market Penetration:** 5% to 20% of target audience

**Maturity:** Adolescent

**Sample Vendors:** Adobe; BryterCX; Cerebri AI; Kitewheel; Salesforce; Splunk; Teradata; Thunderhead; Usermind; [24]7.ai

## Digital Experience Platforms

**Analysis By:** Irina Guseva; Gene Phifer

**Definition:** A digital experience platform (DXP) is an integrated and cohesive piece of technology designed to enable the composition, management, delivery and optimization of contextualized digital experiences across multiexperience customer journeys.

**Position and Adoption Speed Justification:** DXPs emerged because traditional approaches to creating, managing and delivering digital experiences across multiple channels were failing to meet escalating business and IT needs. The former WCM and portal vendors began delivering more comprehensive platforms for creating and managing digital experiences across multiple touchpoints of the customer journey. DXPs are now resonating with the buyers, and interest and awareness are still increasing, as they're inching toward becoming a mainstream technology. As organizations embark on digital transformation programs, the interest for innovative DXPs will increase.

The most common deployment approach is to obtain the core platform from a single vendor, and then supplement it with best-of-breed technologies where functional gaps exist for addressing B2C, B2B and B2E use cases. An API-first approach, integration and interoperability are, therefore, key attributes. A DXP must be pluggable and extensible, and should easily integrate with adjacent technologies, such as digital commerce and CRM.

**User Advice:** Take the following steps:

- Identify the business outcomes you must achieve on the road to digital business success.
- Define the role of digital experience manager.

- Decide the capabilities and characteristics of your ideal DX platform.
- Make an inventory of the tools currently used for presentation management and presentation layer composition across all supported devices, channels and modalities.
- Identify overlaps and duplicate capabilities, as well as gaps.
- Pinpoint synergies where common vendors are identified.
- Demand that your vendors present their product roadmaps.
- Identify where and how integrations will occur.
- Explore the many vendor options available on the market, then draw up a roadmap to adopt a DXP during the next 12 to 36 months.

If you have already bought or built most of the components of a DXP, and are happy with them, fill in any gaps and pursue a do-it-yourself approach. If you are lacking major components, consider a DXP product as a source for the missing components. If you don't have much of a platform, or don't like most of the components you are using, consider buying a full product from a specialist vendor. For an agile, flexible DXP, look for extensive use of API models, cloud-native and incorporation of microservices architectures.

**Business Impact:** A poor digital experience results in a poor customer experience. DXPs help enterprises deliver compelling digital experiences for both internal customers (employees and citizens) and external customers (consumers and partners). Most enterprises deliver customer experience (CX) in silos, based on brand, product, or geography, which leads

to poor CX. DXPs provide significant efficiencies in composition, management, delivery, contextualization and optimization of digital experiences across multiple touchpoints. The DXP addresses an enterprise's need for a consistent, integrated, versatile and optimized approach to CX across a wide range of engagement scenarios, audiences, channels, devices and modes. The integrated nature of a DXP can mean faster time to market and lower deployment costs, as well as higher levels of customer engagement and satisfaction.

**Benefit Rating:** High

**Market Penetration:** 5% to 20% of target audience

**Maturity:** Adolescent

**Sample Vendors:** Acquia; Adobe; Bloomreach; Episerver; Liferay; Microsoft; Oracle; Salesforce; Sitecore

IoT for Customer Service

**Analysis By:** Jim Robinson

**Definition:** Internet of Things for customer service refers to devices (equipment, vehicles, etc.) that contain technology to sense and communicate their internal states via edge computing, analytics and APIs to support proactive services for customer/device support. Sometimes referred to as IoT intelligent monitoring, machine-to-machine or smart device management, it is critical to field service support. The added intelligence and communications of things make it possible to monitor operations, status, service levels, and many other metrics.

**Position and Adoption Speed Justification:** Internet of Things (IoT) for customer service is a proactive service that can also feed valuable contextual information to marketing and sales. The demand to integrate IoT

into CRM strategies and software has increased the complexity of deploying solutions and measuring benefits. Remote monitoring and device management passes along the contextual information of the machine, device or equipment (such as heat, vibration, capacity, location or state) in a proactive way to a central alert system, where it can be analyzed against operational criteria. As the computational intelligence within internet-connected things increases, so will their ability to request support. This has increased expectations among customers for organizations to analyze and triage vast amounts of data in order to determine a response and proactively provide service. Early adopters have faced headwinds in developing processes to manage ever-increasing amounts of data.

**User Advice:** IT leaders working on field service or customer support should examine which physical products need to be monitored for proactive care. They should create a plan to collect and deliver real-time data of monitored processes and products, with the goal of removing the need for unnecessary maintenance checks. This helps to pinpoint failure points and highlights the most likely fixes.

Software-based monitors and proactive diagnostics are embedded in a range of physical devices, from capital equipment (for example, medical devices, printers, automated teller machines, kiosks, and oil and gas refineries) to physical structures (such as bridges, walkways and stadiums) or common consumer equipment (such as home appliances, automobiles or even the human body). Their use is radically changing support costs, improving uptime and moving the support equation from reactive to proactive.

**Business Impact:** IoT for customer service will increasingly be incorporated into large capital projects such as skyscrapers, stadiums, highways and bridges. IoT intelligent monitoring and management is a basic technology approach in industries such as oil and gas, cable and airlines. It can be used to decrease

carbon emissions because it reduces the need for nonessential maintenance inspections and supports environmentally conscious IT. Rapid detection of issues reduces unforeseen downtime through preventive repair and maintenance.

**Benefit Rating:** High

**Market Penetration:** 1% to 5% of target audience

**Maturity:** Emerging

**Sample Vendors:** GE; Microsoft; Oracle; PTC; Salesforce; SAP Leonardo

## Customer Engagement Hub

**Analysis By:** Jim Davies

**Definition:** A customer engagement hub (CEH) is an architectural framework that ties multiple systems together to engage customers optimally. It enables proactive and reactive communication, as well as personalized, contextual customer engagement, using humans, artificial agents or sensors, across all interaction channels. It can also reach and connect all departments to enable, for example, synchronization of marketing, sales and customer service processes, as well as analysis of back-end and Internet of Things information and event streams.

**Position and Adoption Speed Justification:** A CEH is a core component of a digital business technology platform. By 2022, 60% of large organizations will extend their customer experience (CX) technology and process goals by tying together disparate systems in a holistic approach focused on the needs of customers. Additionally, departments such as marketing, digital commerce and sales will join with IT leaders to develop plans for CEHs. Even so, by 2022, only 40% of organizations will select the correct technologies to make a CEH work, and only just over 10% of CEH

architectures will include real-time event streaming, streaming analytics and continuous intelligence. The need to support the “anytime, anywhere” customer (on mobile devices, smart devices and social networks), together with the need for heightened business awareness, should make remedying these shortcomings a priority for IT leaders. This proliferation of devices, along with the vast permutations of digital touchpoints and interaction modalities, requires application leaders to transcend omnichannel and embrace a “multiexperience” UX concept to achieve greater CX outcomes in a world driven by digital experiences.

**User Advice:** Application leaders responsible for the CX (or for integration) and assisting chief marketing officers, digital commerce leaders and customer care directors should:

- Approach the idea of the CEH as a business strategy linked to a technology framework, rather than as a software product to be bought from the market.
- Test the fitness of CRM/CX-oriented applications to meet the needs of engaged customers.
- Examine vendors’ roadmaps and readiness — as well as of their own organization — to evolve customer engagement processes and technologies.
- Identify where to apply real-time continuous intelligence in their CEH by working with marketing, sales and service leaders. The objective is to optimize real-time, cross-process, cross-business-domain, context-aware decisions and achieve a positive ROI by closing key customer journey gaps.

**Business Impact:** Operational and technology silos will remain a norm that IT leaders must confront in large enterprises. In place of a “rip and replace”

struggle, a focus on the emerging CEH will foster personalized and consistent engagement with customers, while gaining agreement from both IT and business functions.

The CEH will support a transition from transactional economics to a more comprehensive view of customer relationship economics. The topic of customer engagement and care will become a more systemic theme across enterprises of many types — in sectors ranging from retail to healthcare. As CIOs strive to fulfill their new mandate to deliver better business outcomes for their enterprises, a CEH will be required to support their efforts.

It is not yet clear how this requirement will impact the software market, but software vendors that neglect the shift will lose market share. At present, most components of a CEH are not bundled as a suite. There is a 40% likelihood that the CEH will remain a system of systems and never evolve into a product. As organizations plan to engage customers with a greater array of digital touchpoints and interaction modalities, multiexperience will become an increasingly important strategy aligned with CEH.

Vendors tend to focus on what can be mass-produced and easily sold, rather than on products that can transform a business but require complex buying centers and change management. This limits the feasibility of a true CEH. However, the issue of siloed customer engagement efforts and processes is gaining the attention of business and IT leaders, as well as software vendors. We expect that large CRM software vendors will introduce new capabilities to bridge capability gaps by means of acquisitions, partnerships with system integrators, and their own research and development efforts.

There is a chance, therefore, that, in the next three years, one large CRM software vendor will offer a complete CEH solution. Such a solution could emerge to target the large-enterprise sector with a strong focus

on hybrid architecture and integration capabilities. It would be the result of advances in service-enabled architectures, which tie together smaller suites. It could also emerge to target the midsize-enterprise market through a cloud-only approach.

**Benefit Rating:** High

**Market Penetration:** 5% to 20% of target audience

**Maturity:** Adolescent

**Sample Vendors:** Pegasystems; Salesforce; Usermind; ZineOne

## Augmented Reality for Customer Support

**Analysis By:** Jim Robinson

**Definition:** Augmented reality for customer support lays a combination of 3D graphics, video feeds, annotations and sound over the user's direct or indirect view of the physical world. It projects these digital assets onto an optically transparent surface — such as a vehicle's windshield, glasses or other head-mounted display — or superimposes them onto the feed from a tablet, phone or other camera. Customers and technicians can receive visual information or assistance without having to use hands or glance away from the physical environment.

**Position and Adoption Speed Justification:** Many startup organizations and some large ERP and CRM vendors have begun to integrate AR solutions for customer support, particularly for field-service technicians or hands-free, end-user remote support, self-service and in-context instructional video use cases. However, many organizations are more familiar with augmented reality (AR) as used for engineering, modeling and design tasks, or as sales tools that help a potential customer visualize a finished product. Many are just learning of its potential applicability to customer support.

IT departments find current applications difficult to extend, modify and integrate. Reasons for slow uptake include hardware battery life, capacity, internet coverage/access, lack of durability for field work, safety uncertainty (such as impact on field of view and eye strain), software cost, and a lack of integration tools. AR-enabled content has traditionally been difficult and/or expensive to produce, but tools have penetrated into midsize and smaller organizations quickly of late, driven by an increase in priority for nontouch collaboration. Many early adopters have used phones or tablets instead of head-mounted displays (HMDs) to display the combination of digital assets and the real world because of better durability, battery life, portability and connectivity. However, use cases that require hands-free operation will require better HMDs.

These issues, as well as difficulties predicting ROI, will slow, but not stop mainstream adoption in customer support through 2022.

**User Advice:** We recommend:

- Tactically examine AR software and associated hardware for customer support, in particular if you sell, install or maintain capital equipment or support customers that perform their own maintenance or repair activities on their equipment.
- Develop a proof of concept for a single use case that requires hands-free interaction, such as in-task training or diagnosis that requires collaboration between an on-site resource and a remote expert.
- Review each vendor's AI-driven capabilities — such as natural language processing and machine vision — and use their impact on user experience (UX) as evaluation criteria. Also, compare their level of integration with other apps your target users

already use, and the potential to evolve toward a UX that has the feel of a single app.

- Determine which vendor(s) will be needed to source, curate and produce content such as recorded video, animated overlays etc. Consider where the repository for AR-enhanced video content will be (in the AR tool, in a knowledge management system, in other cloud infrastructure, etc.).
- Advances in cloud scalability and elasticity, as well as improvements in battery life and durability, will lead to additional software vendor interest in further investments. Additionally, new partnerships or simplified development kits could cause a faster-than-anticipated adoption curve.

**Business Impact:** AR software for customer support accelerates the discovery and resolution of problems. Technicians can perform manipulations of components either remotely or on-site or guide a technician/customer from a remote location. Customers can view instructions or understand how to use a device or machine by manipulating it virtually, while receiving instructions via text, video, voice and “telestration” (i.e., the support person annotates a remote person's field of view by drawing arrows, circles and text boxes that dock to components of a live or still image). This can lower support costs while raising client satisfaction.

**Benefit Rating:** High

**Market Penetration:** 5% to 20% of target audience

**Maturity:** Adolescent

**Sample Vendors:** Fieldbit; Help Lightning; Microsoft; Oracle; OverIT; PTC; Scope AR; SightCall; TechSee; Upskill

## Conversational User Interfaces

**Analysis By:** Magnus Revang; Van Baker

**Definition:** Conversational user interface (CUI) is a high-level design model in which the user and machine interactions primarily occur in the user's spoken or written natural language. Sophistication of the CUI can vary from understanding just simple verbal utterances to handling complex multiturn interactions.

**Position and Adoption Speed Justification:** CUIs can exist as a front end to application or business process, but also as a description of the interface employed by chatbots and virtual assistants. It's being popularized through products like the Amazon Echo that uses the Amazon Alexa Virtual Personal Assistant (VPA) and Google Home that uses Google Assistant VPA. Enterprises are coming on board, with chatbots and virtual agents being the primary use case for AI technology in enterprises.

The promise of CUIs is a shift in responsibility between the user and the interface. In traditional user interfaces (UIs), the user is an operator of the technology and is largely responsible for the effects of using the technology. In a CUI, this responsibility shifts as the CUI is responsible for taking the user input and determining the intention of the user. Conceptually, the CUI has taken over some of the responsibility that was once reserved for the user. This makes CUIs the first widespread adoption of agent user interfaces.

CUIs will evolve their conversational capabilities through advances in natural language understanding (NLU) and in more advanced dialogue management. Additionally, we will see the introduction of multimodal interactions, where speech, text, video and point-and-click interactions are all part of the input used to determine the intention of the user.

**User Advice:** The conceptual shift away from the user as the operator toward the user as conversing with

an agent that will execute on a determined intention — has greater impact on the enterprise than most realize. Training, onboarding, escalations, productivity, empowerment and responsibility all change with this new model and need to be embraced as part of CUI projects. Treat CUIs as transformative and plan on it, and by evolution AUIs becoming the dominant interaction model in the future.

Underlying technology supporting CUIs, either front ends delivered as part of software or custom developed CUIs like chatbots and virtual agents built on top of conversational platforms, still needs to evolve until they reach their potential. Vendor and technology choice is tactical for the foreseeable future. Voice will also arrive as a strong modality, but trail text in capabilities for some time.

Prepare for CUIs to communicate with each other. Larger architectures connecting different use cases for CUIs, like virtual agents for customer service, HR, IT to front ends for enterprise software, business intelligence tools, etc., will be a central challenge for organizations in the next three to five years. This will lead to a variety of architectural models like CUI-to-CUI communication and specialist tooling entering the market.

Prepare for new roles in the enterprise. Dialogue designer, AI trainer, digital coach, humanizer and AI interaction designer are all titles Gartner is seeing in the market to support the creation of conversational experiences.

**Business Impact:** CUIs are the interaction pattern of many chatbots and virtual assistants — both will be significant contributors to the impact of CUIs, especially in high-touch communicative fields of customer service and Q&A-type interactions with significant volume.

Outside of this, CUIs will appear primarily in new applications. Enterprise IT leaders should be on the lookout for (and biased toward) CUIs to improve employee (and customer) effectiveness, as well as to cut operating expenses and time spent learning arcane computer semantics.

There will also be some retrofitting. Over the next three to five years, we do not expect large enterprises to invest heavily in retrofitting existing systems of record where the employee base is experienced and stable, and the feature set is well-known to the user base. Where there is high employee turnover or rapid changes in features, or enterprises face a burden of providing computer literacy training, IT leaders need to consider creating people-literate front ends to make it easier for employees to adapt and excel.

**Benefit Rating:** Transformational

**Market Penetration:** 5% to 20% of target audience

**Maturity:** Adolescent

**Sample Vendors:** Amazon; Baidu; Facebook; Google; IBM; IPsoft; Microsoft; Oracle; Salesforce; SAP

## Natural Language Processing (NLP)

**Analysis By:** Bern Elliot; Erick Brethenoux

**Definition:** Natural language processing (NLP) enables an intuitive form of communication between humans and systems, i.e., NLP includes computational linguistic techniques aimed at parsing and interpreting (and sometimes generating) human languages. NLP techniques deal with the pragmatics (contextual), semantics (meanings), grammatical (syntax) and lexical (words) aspects of natural languages. The phonetic part is often left to speech-processing technologies that are essentially signal-processing systems.

**Position and Adoption Speed Justification:** Enterprise NLP usage is increasing as capabilities improve, along with new use cases based on conversational agents and automatic machine translation among others. Existing syntactic- and semantic-based methods are increasingly augmented and displaced with deep neural networks (DNNs) approaches, which are also referred to as sub-symbolic techniques.

Visible accomplishments include technologies that:

- Improve natural language parsing (via Google's SyntaxNet, an open-source, DNN-based, natural language parsing framework for TensorFlow)
- Translate in real time from one spoken language to another (as in Microsoft's Skype Translator)
- Build large-scale knowledge graphs (illustrated by the work of Google, IBM and Microsoft)
- Offer answers instead of a list of page links (as in Google's information cards)
- Use of transfer learning to bootstrap training of new languages (research report by Amazon)

However, human language is complex and deeply influenced by cultural and other idiosyncratic conditions. So while NLP solutions have made progress, there are many subtleties and nuances that require human intervention to enable proper interpretation. These limitations are slowing adoption. For instance, dialogue capabilities are weak, DNNs are experimental and fragile, and understanding, inferences, context and synthesis pose significant challenges. Additionally, many NLP solutions require specialists in order to ensure continued accuracy of the grammars and models.

**User Advice:** NLP offers enterprises significant opportunities to improve operations and services. For many enterprises, the strongest and most immediate use cases for NLP are related to improved customer service (impacting cost, service levels, customer satisfaction and upselling), employee support (including making them smarter and more effective in their work) and automation of legal tasks (such as contract analysis, compliance enforcement, etc.).

Initial projects should start with modest goals in order to demonstrate success. As experience is obtained, projects should iterate, and scope can increase. More accessible use cases include translation of blogs and other casual documents, or mining text from customer interactions for insights on sentiment or issues is one of the more accessible use case.

Additional current NLP opportunities exist for enterprises but are not as mature or will require effort before they provide consistent returns on investment. Translation or transcription services, for instance for meetings or documents, offer opportunities to improve operations and lower costs. However, these NLP-based solutions are less accurate than similar human-based options and may benefit in some cases from human involvement.

As enterprises enhance their NLP implementations, new skills should be explored. Computational linguists, for example, are versed in the manipulation of various linguistic techniques and the impact of natural communications on users. Upskilling of data scientist talents might also be necessary given the increasing use of data science techniques in NLP applications.

Finally, the quality of NLP solutions offering knowledge-based consolidation, content mapping, search enhancements and text summarization will vary. As a result, enterprise planners should test and verify the effectiveness of these solutions before making significant commitments. If enterprises invest

in specialized grammars, care should be taken that these be compatible across vendor solutions.

**Business Impact:** To obtain clear near-term ROI and to build enterprise knowledge and skills in the area of NLP, planners should leverage NLP applications such as:

- Virtual assistants and chatbots to improve interactions, including employee and customer services in select environments.
- Text mining to extract and summarize the focus of textual reports and preview what questions are most common before building chatbots.
- Basic transcription and translation services.
- Language-generation applications that produce natural language descriptions of tabular data, making it easier for many to understand.
- Keyword tagging in documents, making it easier to determine relevant sections or to extract other information such as intent and entities.
- Content moderation services that examine user-generated content (text or images), to flag potentially offensive content or to identify fake news in social media.
- Sentiment analysis to identify the feeling, opinion expressed in statements — from negative to neutral, to positive.
- Search improvements by better understanding the intent of a search query as well as by summarizing content that is retrieved.
- Text analytics to quickly process large numbers of organizations' documents and determine their compliance or legal validity.

- Advancement in insight engine text capabilities combined with more advanced NLP functionality.

**Benefit Rating:** Transformational

**Market Penetration:** 5% to 20% of target audience

**Maturity:** Emerging

**Sample Vendors:** Bitext; Clarabridge; CognitiveScale; Digital Reasoning; Google; IBM Watson; Microsoft; NLTK; SAS

## Sliding Into the Trough

### 360-Degree View

**Analysis By:** Simon Walker

**Definition:** A 360-degree view brings together selected data about a customer, product or other business-critical objects to fulfill one or more specific business requirements. The resultant object can then be “viewed” holistically through many business contexts, whether they be operational or analytical. From these holistic views, better business outcomes can be achieved, such as improved customer or citizen experience, customer or citizen service, and procurement and product sales and service.

**Position and Adoption Speed Justification:** Confusion in the market on how to approach this is a direct result of overlap in features and functionality between different technologies and approaches. The hype for 360-degree view has stalled because of growing confusion from competing technologies such as application data management (ADM), customer data platforms (CDP) and master data management (MDM), in addition to solution-focused tools for data stewardship and data quality. These differ in complexity, cost, impact and reward. The confusion is heightened as the level of interest in 360-degree extends to nontechnologists. MDM, when designed

and implemented effectively, offers the biggest reward, but requires the biggest effort. Gartner recommends that data and analytics leaders work with stakeholders to ensure the foundations for success are established. It may help to recognize:

- MDM is effectively rightsized when the scope of master data involved is the least amount of data most widely shared across the most important business processes, decisions and systems/apps.
- ADM is effectively rightsized when the scope of the application data is tied to a specific application or integrated suite, and that data is not shared or reused outside of that application or suite.
- 360-degree solutions are most effective when master data, application data and other rich data specific to a channel (e.g., customer, product), is aggregated even if that data is governed and/or mastered in other systems such as MDM or ADM.

**User Advice:** A 360-degree view can only be achieved with a foundation of trusted high-quality master data at its core. However, MDM is only part of the story. Realization of a 360-degree view will require a combination of targeted master data, application data, and event or other relationship data to fulfill specific business requirements. Example analytical approaches to creating a 360-degree view include data lakes, enterprise data warehouse, contextual MDM, or a logical data warehouse.

**Business Impact:** Organizations that neglect MDM, ADM and EIM while creating a 360-degree view risk delivering erroneous data to the business, from which poor operations, insights and decisions will result. However, master data on its own is not enough. Data and analytics leaders that successfully identify and connect additional data sources to trusted master data in support of specific demand-centric business requirements will unlock the potential for business

value. As such, a 360-degree view can be used to “close the loop” so that operations, insights and decisions based on business-critical objects can then be enabled holistically through many business contexts.

**Benefit Rating:** High

**Market Penetration:** 5% to 20% of target audience

**Maturity:** Adolescent

**Sample Vendors:** Adobe; IBM; Informatica; Reltio; Salesforce; Semarchy

## Customer Service Analytics

**Analysis By:** Steve Blood; David Norrie

**Definition:** Customer service analytics is the combination of interaction analytics (desktop, speech and text), customer journey analytics and next best action analytics that collectively surface real-time and historical insight into the customer service experience. Analysis and outcomes leverage and enable organizations to make improvements to customer experience, employee experience or business process.

**Position and Adoption Speed Justification:** Customer service analytics is a core capability of Knowledge & Insight, one of the four pillars of great customer service. Customer service analytics is also evolving — what started out as discrete desktop, speech and text analytics; capabilities to understand and improve on customer service operations through mining of phone calls, emails and messages as well as analyzing advisor desktop actions, is becoming a more integrated part of a strategy for analyzing customer experience. From a maturity perspective, text analytics is more readily available but many of the initial challenges with mining telephone recordings are being resolved with improved quality of categorization of conversations using artificial intelligence and the

use of machine learning is improving overall accuracy. Coupled with sentiment and emotional analysis, organizations are more readily able to surface insights into customer experience. As interest in customer analytics grows, providers of previously siloed, best-of-breed capabilities are extending their products into adjacent areas increasing the potential to offer a customer service analytics suite, composed of interaction analytics, customer journey analytics and next best action. While a single suite capability is not yet available in market, the opportunity to select analytics providers that can offer a solution for multiple customer service analytics use cases (e.g., voice of the customer, employee coaching, next best action, fraud detection, loyalty prediction) will offer the potential to better manage the operating costs of offering analytics.

**User Advice:** Calculate the potential added value of this integrated analytical technology suite above and beyond siloed technologies, such as speech analytics or performance management. Pay particular attention to the technical architecture and ensure alignment with the organization’s overall customer analytics strategy. Broaden the value proposition by identifying LOBs outside of customer service and support such as marketing and HR.

**Business Impact:** Deployment in a customer service center may uncover a diverse range of insights that can be used to improve the performance of the operation and its advisors, including customer and departmental insights (such as customer perceptions of a marketing campaign or a new product pricing strategy). The challenge is in building the business case, because often the insights (and, therefore, the ROI potential) won’t be revealed until the investment has been made. Identifying specific use cases and mapping these to existing case studies can help scope out the potential benefit.

**Benefit Rating:** High

**Market Penetration:** 5% to 20% of target audience

**Maturity:** Adolescent

**Sample Vendors:** CallMiner; Clarabridge; Genesys; Medallia; NICE; OpenText; Verint

### In-App Mobile Customer Service

**Analysis By:** Brian Manusama

**Definition:** In-app mobile customer services reside on or are accessible from smartphones or tablets. They can take the form of contextual search, chat, chatbots, contextual knowledge, location-based customer service or multimodal interaction (where the customer can be in a self-service process or can also request/be given, live-agent support via chat voice or co-browsing). Gartner refers to the different touchpoints on mobile with a different user experience (UX) as multiexperience (MX).

**Position and Adoption Speed Justification:** In-app mobile customer services usage from enterprises is driven mainly by a small percentage of its customers. This is mainly because they are viewed as ineffective for many key processes, the UX is poor and because there is little valuable customer service capability built into the apps. In-App customer service software unfortunately still lacks the levels of customer support that are available on other channels. Some of them are still not native to the device and then can fail to exploit all of the capabilities of the mobile platform. This gap will hamper enterprise initiatives in cases where customers expect a rich and satisfying mobile experience. The in-app mobile capability needs to move to MX in order to enter the Plateau of Productivity. Customers are expecting a more effortless experience when they use mobile apps.

**User Advice:** Without compelling MX functions, apps will not be used. The IT organization, in partnership with the vice president of customer experience or

customer support, should survey the customer's satisfaction level in terms of the support they receive for key activities on mobile devices, and customer appetite for various features. Use the results to raise awareness of the current state of mobile support, and to create a roadmap for improving customer support and for evaluating CRM vendors' mobile support technologies.

**Business Impact:** Excellent mobile customer service will hasten the transition from customer use of corporate websites on laptops or desktop computers to usage on mobile devices. Because the consumer preference for mobile is advancing rapidly and, for some industries, will reach 85% of all internet interactions by year-end 2022, failing to improve mobile customer service will harm businesses.

**Benefit Rating:** High

**Market Penetration:** 20% to 50% of target audience

**Maturity:** Adolescent

**Sample Vendors:** Conversocial; Helpshift; Khoros; LivePerson; Oracle; Quiq; Salesforce

### Video Calling for Customer Service

**Analysis By:** Brian Manusama

**Definition:** Video calling for customer service involves live video streaming between a customer and an agent to deliver customer service and support. Video calling with customer service and support agents is available over mobile devices, on websites and at kiosks to assist with a wide range of issues. Initially focused on putting a face back in front of the customer, video calling can stream one way (from the agent to the customer) or both ways when customers have cameras enabled.

**Position and Adoption Speed Justification:** Visual engagement, especially video calling, is gaining traction in the customer engagement market. Companies feel the sense of urgency to deliver excellent customer experience as a competitive differentiator. Video chat for customer engagement is becoming a standard offering for software vendors in different markets of the customer engagement center, contact center as a service (CCaaS) and digital customer services. This is driven by the fast growth of mobile devices, the COVID-19 pandemic and the necessity to work from home.

What's new is that video calling is gaining renewed attention in planning cycles to be the escalation channel of customer self-service. Customers that escalate out of self-service are often frustrated and/or angry, realize that they have a complex request or do not feel comfortable dealing with a delicate matter in a self-service manner. In order to continue the journey in the most personalized way, customers start to choose video calls to resolve the escalation. Also, the use of video for onboarding customers is new. By using video, virtual customer assistants and/or human assistants can support new customers installing their new acquired devices.

Customers, employees and business partners are favorably impressed by the presence of a live agent when communicating on video. As an alternative to face-to-face personal contact, video calling provides customers a rich sense of presence, a personalized experience that helps coordinate communication, the benefit of emotional expression, and real-time sharing of content.

Video calling is being evaluated across all industries, but its adoption is most successful in highly specialized areas, including financial advisors and medical and health practitioners where high-touch value is expected. The uptake of video calling is uneven, with business-to-business scenarios being

faster to adopt than consumer-facing businesses. The market for video calling is advancing as digital identification and authentication become part of the end-to-end offering of this technology.

**User Advice:** Organizations should make video a part of their engagement strategies for all customers as well as for escalation of customer self-service initiatives. We find offering the customer the option of activating their video to be a best practice. In every industry, given the new normal that comes out of 2020:

- Investigate your customer journeys, find your moments of truth and explore all the use cases for video chat engagement.
- Consider bimodal opportunities, such as browser sharing and video chat, or SMS, or blending chatbot sessions with video chat.
- Placing an organizational representative face to face with a customer requires careful consideration, and three key issues need to be considered:
  - The appearance of physical agents.
  - The agent's physical environment is important and should convey a place where work can be accomplished with focus and concentration.
  - As video sessions may require many keystroke entries and moving between multiple screens, the agent will be distracted, looking at the screen and not at the camera. This may cause the customer to feel neglected and result in a poor customer experience.

Next to these three issues, consider the nature of your product and services and the character of your brand to enhance the customer experience.

**Business Impact:** 2020 showed that the impact on businesses is extremely high because video is a medium that will please customers with a personalized experience, as well as serve as a useful tool for field technicians. Given the three issues mentioned above, the average deployment until now is approximately 50 to 100 seats in a 1,000-seat support center. Now that video includes identification and authentication with features like digital signature, usability and adaptability, it will continue to increase as it contributes to customer trust.

Application leaders need to consider building adoption services for video chat and training for agents and managers. Video calling is successfully implemented most often in banking, financial services, retail, automotive and high-tech industries.

**Benefit Rating:** High

**Market Penetration:** 5% to 20% of target audience

**Maturity:** Early mainstream

**Sample Vendors:** Cisco; Enghouse Interactive; Eudata; Genesys; Gance; Microsoft; Salesforce; TechSee; Veeva; Vivocha

## Voice-of-the-Customer Solutions

**Analysis By:** Jim Davies

**Definition:** Voice of the customer (VoC) solutions combine multiple, traditionally siloed technologies associated with the capture, storage and analysis of direct, indirect and inferred customer feedback. Technologies such as surveying, social media monitoring, text and speech analytics, and customer journey analytics are integrated to provide a holistic view of the customer's "voice." The resultant customer insights are acted on by disseminating relevant information to the right employees at the right time via the right channel.

**Position and Adoption Speed Justification:** Most organizations have multiple and often quite mature customer feedback mechanisms, but these are usually departmentally oriented and siloed in nature, and are often not used for strategic purposes. The most common mechanism is surveying, but departments are also increasingly becoming transfixed on capturing and understanding additional customer feedback associated with their specific domains. They are doing so through the use of speech analytics in the contact center, web analytics on the corporate website, and social media monitoring by marketing to capture customer comments. However, these pockets of feedback for the large part remain isolated — few organizations have aligned these various sources to create an integrated VoC hub.

Most organizations aspire to tie these diverse feedback channels together to create a single view, but are currently a few years away from achieving this. Instead, for the majority, the current drive is to improve surveying through investment in a new platform, which can then form the basis of a VoC hub in years to come.

Some momentum has been seen within leading customer-centric organizations, particularly those in consumer-centric industries such as financial services, telecommunications and utilities. But VoC is far from mainstream. The vendor landscape is still emerging, and there are over 20 vendors that have expertise spanning the diversity of feedback collection techniques that a holistic VoC solution encompasses. However, multivendor VoC solution ecosystems — where data is imported into a central solution from one or more third-party solutions — will be the unavoidable organizational deployment strategy for the next few years.

**User Advice:** Ideally, VoC should fall under the remit of a central customer experience function; however, in its absence, find an owner with cross-department

awareness and set up a cross-department VoC committee. Then do the following:

- Conduct an internal audit to assess current capabilities and reduce duplicate departmental customer feedback technologies (such as surveying or social media monitoring).
- Prioritize future initiatives to collect VoC data based on the richness of the content. Strive to obtain a single, holistic view of the VoC.
- Determine the most appropriate data architecture and analytical models/techniques to extract key customer insights at both individual and aggregate levels.
- Distribute relevant insights/actions across the organization (front line and management) in a timely manner using workflow and operational integration.
- Determine what distilled set of feedback metadata (for example, a customer sentiment score) will be fed into the corporate master data management environment.
- Leverage VoC in core business processes, ideally in real time — for example, using a low survey score to open a case within the CRM system.

**Business Impact:** The business impacts of VoC are many and varied. Sources of VoC data are plentiful, ranging from survey results to social media dialogue. Such sources provide valuable venues for analysis, but analytics in isolation inherently limits the opportunity to fully understand customers.

By integrating data from multiple VoC sources, organizations can uncover subtler insights, drive accuracy and ultimately instill more confidence in the actions taken at individual customer (such as an

outbound call) as well as overarching strategic (such as a process change) levels. This holistic approach also ensures that the right insight gets to the right employees at the right time. For example:

- A new lead resulting from a tweet being sent to a sales rep.
- Negative campaign feedback from analyzing a recording of a contact center dialogue being sent to a marketing manager.
- A survey comment to “talk slower” being sent to an agent.

VoC can be used to help manage brand perceptions, understand the customer experience and develop future customer engagement strategies.

**Benefit Rating:** High

**Market Penetration:** 5% to 20% of target audience

**Maturity:** Adolescent

**Sample Vendors:** Clarabridge; Confirmit; InMoment(MaritzCX); Medallia; NICE; Questback; SAP (Qualtrics); SMG; Verint Systems

## Chatbots

**Analysis By:** Magnus Revang

**Definition:** A chatbot is a domain-specific conversational interface that uses an app, messaging platform, social network or chat solution for its conversations. Chatbots range in sophistication from simple, decision-tree-based, to implementations built on feature-rich platforms. They are always narrow in scope. A chatbot can be text- or voice-based, or a combination of both.

**Position and Adoption Speed Justification:** Chatbots represent the No. 1 use of artificial intelligence (AI) in enterprises. Primary use cases are in customer service, human resources, IT help desk, self-service, scheduling, enterprise software front ends, employee productivity and advisory. There are also a variety of offerings in the market, such as developer self-service platforms, managed products, middleware offerings, integrated offerings and best-of-breed approaches.

Chatbots in social media, service desk, HR or commerce, as enterprise software front ends and for self-service, are all growing rapidly. Still, the vast majority of chatbots are simple, relying on scripted responses in a decision tree and relatively few intents. Similar to chatbots are virtual agents, which are broader in scope and sophistication, require more infrastructure and staffing to maintain, and are designed for an extended relationship with their users outside of single interactions. Users will interact with hundreds of chatbots, but few virtual agents.

The majority of implemented chatbots are unsophisticated and rule-based — failing to live up to expectations of stakeholders. The number of proofs of concept (POCs) is high, as is the failure rate to bring even unsophisticated chatbots into production. Gartner is seeing a backlash against chatbots, primarily focused on unsophisticated implementations.

#### **User Advice:**

- Start POCs for chatbots today, because most enterprises experience trouble scaling from the initial POC to production. The focus should be on uncovering the hindrances that will stand in your way.
- Treat vendors as tactical, not strategic — acknowledge that you'll most likely want to switch vendors in the future.

- Focus on vendors offering platforms that can support multiple chatbots.

**Business Impact:** Chatbots are the face of artificial intelligence and will impact all areas where there is communication between humans today. Customer service is a huge area where chatbots are already influential. Indeed, this will have a great impact on the number of service agents employed by an enterprise and how customer service itself is conducted. For chatbots as application interfaces, the change from “the user learns the interface” to “the chatbot is learning what the user wants” has significant implications for onboarding, training, productivity and efficiency inside the workplace. To summarize, chatbots will have a transformational impact on how we interact with technology.

Chatbots have played a strategic role in several companies' response to COVID-19. This might have an acceleration effect on the technology.

**Benefit Rating:** Transformational

**Market Penetration:** 20% to 50% of target audience

**Maturity:** Adolescent

**Sample Vendors:** Amazon; Cognigy; Google; IBM; Microsoft; NTT DOCOMO; Oracle; Rasa; Rulai

### **Recorded Video Customer Service**

**Analysis By:** Brian Manusama

**Definition:** Recorded video customer service is the process of using prerecorded video clips to impart “how to” instructions for customer service, or to provide product or service training. These videos can be hosted on popular social media sites (such as YouTube) or be embedded in a customer self-service knowledge base. They can also be optionally personalized and interactive.

**Position and Adoption Speed Justification:** In our experience economy, the impact of personalized recorded video has become a powerful way to answer customer questions. Organizations have typically discovered that things are much easier to explain to customers using video than over the phone. The most common use case we see today is onboarding new customers to their new services like cable TV, internet access and mobile devices.

Recorded video is often accessed via a customer self-service portal and as a concierge-like approach. However, phone or web chat agents can also provide customers with a web link to a recorded video clip that will show them how to address a specific problem. Like customer communities, P2P support is being offered by vendors.

Technology has improved over the years, going from prerendered video to rendering frame by frame in real time. Once organizations are happy getting the basis of this technology in place, it will be pushed to the level of personalization. By using artificial intelligence and predictive analytics, organizations will be able to create an individual presentation that allows interactive exploration of account information in real time. This way, each video is created using real-time information to personalize the engagement.

**User Advice:** The popularity of video to illustrate the use, maintenance and repair of products, or the use of services, demands that organizations respect their customers' and constituents' desire for this emerging channel. Customer support managers, product managers and website managers should use this channel to enhance their customer service offerings.

Start by identifying the most frequently asked questions in the customer engagement center (CEC), and focus on producing how-to videos for these issues before moving on to lower-priority issues. The videos can be created informally by employees or the

organization itself, or formally by a production studio. Progress when comfortable using the technology with more advanced use cases to get the real value, such as (1) targeting interactions where the agent otherwise has to engage in complex and lengthy explanations, and (2) targeting interactions that agents engage in with more frequency.

Develop product/service training for existing employees to stimulate continued learning, and for new employees to reduce training time and trainers.

**Business Impact:** The impact of this engagement channel on businesses is potentially relatively high because video makes customers happy, and training makes employees feel happy. It will also have good containment — that is, there is no need for follow up on another channel, as it's a good means of imparting information.

Prerecorded video clips that give how-to instructions that support products, customer service or training are proving immediately valuable to the bottom line.

Videos are particularly effective at capturing and recording deep and broad instructions for processes. They also create trust and transparency. Manipulative acts for mechanics, development logic for software workers and lengthy time-lapse processes for workers of all kinds are just a few of the “task families” that video can educate customers and employees in learning activities. Whether using a how-to video to change a battery on a vehicle or a laptop, or as a demonstration tool, organizations can deflect interactions away from the CEC. These video clips can form part of an organization's internal video knowledge repository, or can be accessed from social networks, such as YouTube or Vimeo using a search tool for internal knowledge bases. When stored in a knowledge repository, this is referred to as “video knowledge.”

**Benefit Rating:** High

**Market Penetration:** 5% to 20% of target audience

**Maturity:** Adolescent

**Sample Vendors:** Avaya; eGain; Idomoo; Moxie; Pitney Bowes; Recursive Labs; Verint Systems

## Speech Analytics for Customer Service

**Analysis By:** Steve Blood

**Definition:** Speech analytics embraces phrase-matching, phonetic indexing and transcription technologies to extract insights from prerecorded and, more recently, real-time voice streams. Artificial intelligence and machine learning are employed to improve categorization and accuracy. These insights are used primarily to classify calls, trigger alerts and workflows, and improve operational and employee performance across an enterprise, and are increasingly used to provide a complementary perspective to voice of the customer (VoC) programs.

**Position and Adoption Speed Justification:** Speech analytics is a core component of knowledge and insight, one of the four pillars of great customer service. There have been rapid developments in speech-to-text technologies during the past few years through the use of AI and machine learning. Improvements in natural language understanding and conversational speech mean that organizations can increasingly turn their attention to speech analytics. An opportunity is created to mine the wealth of knowledge stored in call recording platforms within the contact center to reveal a potentially transformational understanding of customer and staff needs. Mining knowledge enhances operational efficiency, improves understanding of the customer experience and reduces churn. Additionally, the availability of SaaS solutions is reducing the barrier to adoption by reducing costs and deployment complexity.

Investment will continue to increase as part of holistic customer service and corporate analytics strategies. Speech analytics is available through a number of sources:

- Engine providers (such as Amazon, Google, IBM and Nuance)
- Best-of-breed providers (such as Yacraq, CallMiner, Zen3 and Tethr)
- Customer experience management providers (such as Verint Systems, Clarabridge, Medallia and Calabrio)
- Contact center as a service providers (such as NICE inContact and Genesys)

Interest from other buying centers, such as marketing and sales departments, is increasing due to the relevance of speech analytics insights. We are seeing some market consolidation with text analytics providers in this area — Clarabridge adding speech analytics and Medallia's acquisition of Voci are recent examples.

The real-time speech analytics segment is less mature. However, developments in transcription technologies and improvements in accuracy as a result of AI and ML will help to deliver some real-time analyses in the areas of next best action and employee support. Through the next 24 months, early trials will lead to clearer use cases and business justification.

### User Advice:

- Conduct pilot projects to evaluate whether speech analytics can provide significant business value. Align speech analytics with other customer service analytics initiatives, such as text analytics, which is inherently more mature.

- Focus on call classification, the impact on quality management, and the value of insights that can be fed back to sales (such as pricing sensitivity), marketing (campaign awareness and competitive deals) and product development (current issues, needs and competitive products).
- Determine the technology stack (keyword/phrase, phonetic or transcription) that best suits your organizational needs, because each has its strengths and weaknesses.
- Choose the deployment model (SaaS, in-house or managed service) that best suits your short- and long-term financial plans, as well as the availability of resources and expertise within your organization.

**Business Impact:** Speech analytics solutions:

- Improve customer engagement center agents' performance and compliance.
- Increase customer satisfaction by identifying issues and enabling customer service leaders to take appropriate actions.
- Enable a better understanding of customer needs and issues.
- Provide insights into product feedback, pricing issues and market campaign effects.
- Improve access to previously unsearchable audio information and assets, such as analyst calls and educational materials.
- Help prevent fraudulent interactions
- Enable customer service organizations to understand which types of inquiries they could automate, and help to reduce the complexity of inquires that need to be handled by live advisors.

**Benefit Rating:** High

**Market Penetration:** 5% to 20% of target audience

**Maturity:** Adolescent

**Sample Vendors:** Amazon; Calabrio; CallMiner; Clarabridge; Genesys; Google; Medallia; NICE; Verint Systems; Yactraq

## Knowledge Management for Customer Service

**Analysis By:** Drew Kraus

**Definition:** Knowledge management (KM) for customer service includes the creation, discovery, and delivery of various forms of targeted content for support agents, customers, chatbots, peer-to-peer support communities and partners. It involves the accumulation and management of a knowledge repository and other knowledge assets, and the delivery of knowledge to appropriate people via desired channels. Artificial intelligence (AI)/machine learning (ML) and social ratings are enabling advances in this field.

**Position and Adoption Speed Justification:** Ownership of, and success with, KM is rarely recognized within enterprises, and application leaders are therefore reluctant to pay much attention to this vital area. New uses of ML, combined with communication via chatbots and devices, have created new opportunities and challenges for knowledge delivery. An emerging trend is the rapid expansion of contextual content into chatbots, virtual customer assistants (VCAs) and virtual personal assistants, and its integration with all customer service channels (such as mobile, web chat, messaging, email, voice and VCAs for self-service). The content is a combination of a well-structured database, indexed content, search engine and conversational AI-enabled responses. In organizations that successfully exploit this self-service option, their knowledge databases are supported by dedicated

knowledge workers who constantly update and fine-tune the knowledge engine to improve the accuracy of responses. This involves maintaining and expanding the collection and categorization of knowledge — thereby reducing dependence on humans to identify and categorize knowledge — by enabling faster retrieval of appropriate data elements, at the proper time and through a web-based or mobile interface.

The increased focus on inserting social knowledge and authoring from external sources directly into the corporate knowledge repository, as well as the use of ML and AI, has resulted in renewed focus on KM for self-service. This, in turn, is resulting in slow progress by KM for customer service through the Trough of Disillusionment. Organizations will also use social knowledge collection tools to harvest information that is being written about a company's products and services. These tools will bring the information in-house, where it can be reviewed and analyzed. If the information is valuable, the knowledge base will be updated.

**User Advice:** Always measure the business metrics that are improved by KM. A knowledge repository, plus the tagging and indexing of other content sources, takes six to eight weeks to structure well, and six more months to become mature enough to enable a satisfactory level of self-service fulfillment and first-call resolution. It also requires ongoing care and maintenance. We recommend that you:

- Appoint a dedicated team of knowledge subject matter experts to keep abreast of emerging technologies and their impact on KM, as well as to continuously enhance the knowledge engine and provide feedback.
- Don't assume that knowledge repositories will be created and kept up-to-date voluntarily by employees who are not motivated or compelled to do so.
- Establish an “unresolved” process on a self-service website, so that a user can notify the knowledge team if his or her query has not been resolved.
- Implement an SLA of 24 hours for the knowledge team to capture a resolution of all unresolved items.
- Ensure that all channels and agents in the customer engagement center use the same knowledge repository to ensure consistent and accurate responses.

**Business Impact:** This technology enables the creation, acquisition, storage, delivery and maintenance of corporate knowledge, information and data in formats that web-based, self-service or mobile applications can easily access, alongside the collection of knowledge from third-party websites, social media and hosted communities.

**Benefit Rating:** High

**Market Penetration:** 5% to 20% of target audience

**Maturity:** Adolescent

**Sample Vendors:** Coveo; eGain; KMS Lighthouse; MindTouch; Oracle; Panviva; Salesforce; ServiceNow; Transversal; Verint Systems

## Virtual Customer Assistants

**Analysis By:** Brian Manusama

**Definition:** A virtual customer assistant (VCA) is an application that acts on behalf of an organization to engage, deliver information and/or act on behalf of a customer. It consists of five elements: a conversational customer facing user interface that receives and delivers inputs and outputs, a natural language processing engine; a dialogue manager; a search engine that traverses data repositories

through enterprise integrations and machine learning capability.

**Position and Adoption Speed Justification:** The momentum shifted for VCAs in 2017 when the market exploded after Facebook announced it would be providing a bot framework for developers. Prior work by vendors like IBM Watson, Nuance, Verint Next-IT, IPsoft and Creative Virtual had, however, already raised a vast amount of interest in and awareness of virtual assistant (VA) technology as a practical tool to automate customer engagements. Today, although VCAs that support customer service are the most prevalent use case in the world for automation and self-service, the demand for supporting sales and marketing functions are rising.

The increased interest is based on heavily improved natural language processing technologies from 2017 onwards. Chat-centric mobile channels like messaging, which are designed to engage with customers and customer acceptance of robotic technology are the main drivers behind this rise in interest. Gartner survey tells us that 38% of U.K. and U.S. consumers are ready to shift to VCAs if they were as effective as human agents. The transition from reactive human-programmed virtual assistants that respond to questions with answers found in structured and unstructured content libraries, to proactive, sometimes machine-learned VCAs that look at the characteristics of individuals and act on their behalf is underway.

Current generation of VCA deployments and other types of conversational agents are often not done correctly. Many won't reach the required confidence level needed to ensure customer satisfaction and engagement because incorporating domain-specific content into the model is a challenge. Simply put, these conversational agents cannot capture customer intent or handle unexpected input elegantly. With new, emerging practices from current deployments, a

solid foundation of experiences needs to be built first to take full advantage of the capabilities. Successful implementations have required considerable effort from subject-matter experts.

Virtual customer assistants differ from chatbots as they require more infrastructure, have memory, and form a relationship with customers. Chatbots, on the other hand, are often narrow-cast applications that perform a limited set of tasks such as providing answers to FAQ.

The market for VCA is working its way through the Trough of Disillusionment, on the different Gartner Hype Cycles, to become a productive platform. In 2018, many transaction-based VCAs deployments have hit a wall in regard to delivering value and experience. The market is awash with low-end VCAs and chatbots that deliver a poor user experience, create friction and do not deliver business benefits as the market is maturing. These VCAs will fail, creating a backlash against VCAs in general and create a more guarded buyer. Only the enterprise-grade VCAs that create a compelling user experience and delivery true material business value will survive.

The VCA will be the new starting point to support multiple digital engagement channels. It can be a moderator of a social community, a guide on your mobile device to purchase new fitness equipment or a chat agent to help you open a bank account.

**User Advice:** Application leaders should:

- Determine the current state and desired future state of your customer engagement platforms. What methods and resources do you use today?
- Compare a simple set of serial projects to a complex “big bang” project to meet all identified business needs.

- Find the greatest-frequency simple conversations that constitutes a complete call, and that can be easily automated with a low risk of customer dissatisfaction.
- Identify the next set of complete calls that, at a stretch, might be handled by technology working with humans in the loop who would take over the call if the technology detects an issue. For example, in the case of a knowledge deficit in the VCA, a troubling tone of voice from the customer, or clear signs that the customer is making all the right moves to be closed by a human.
- Leverage capabilities of partners in the market that can bring value to your chosen platform like domain expertise and/or language skills to avoid building everything from the ground up.

**Business Impact:** The VCA is a targeted, special-purpose VA for sales, customer service and digital commerce and has unique objectives. The business impact for VCAs is threefold.

They address the need to:

- Meet expectations for customer support on web and mobile channels by offering a higher frequency of interactions (24/7 and instant chat availability).
- Move engagements to less-expensive customer self-service channels with faster time to resolution (to reduce cost to serve).
- Provide proactive advice and engagement (to build loyalty and customer satisfaction).

The effective use of a VCA allows organizations to scale the numbers of engagements they can handle, especially in the contact center. The use of a voice-enabled VCA in a kiosk or automated teller machine can alleviate the need for typed interventions, and

it can help create an interesting interaction for nontraditional audiences.

**Benefit Rating:** High

**Market Penetration:** 5% to 20% of target audience

**Maturity:** Early mainstream

**Sample Vendors:** Artificial Solutions; Creative Virtual; eGain; IBM Watson; Inbenta; IPsoft; Microsoft; Nuance; Verint Next IT; [24]7.ai

### Robotic Process Automation (RPA)

**Analysis By:** Frances Karamouzis; Saikat Ray; Melanie Alexander

**Definition:** Robotic process automation (RPA) is a licensed software tool for building scripts to integrate any application via the user interface and a control dashboard/orchestrator which automates routine, repetitive, rules based, predictable tasks using structured digital data.

**Position and Adoption Speed Justification:** In their initial form (over five years ago), RPA tools predominantly focused on task-centric use cases. End-user adoption has been consistently growing, and tools are expanding to automate more extensive process workflows. Vendors have grown and made extensive R&D investments. There are also new entrants, such as SAP and Microsoft. Gartner estimates the software market has reached over \$1.3 billion and the services market is over \$5 billion (with continued growth expected). Many buyers have expressed remorse as organizations have not architected their approach in a strategic manner and nor applied the right tools. As such, there has been movement through the Peak of Inflated Expectations, and we foresee a renaissance by morphing offerings and end-user zeal for operational excellence in a digital mode. This will

now be heightened with the sharp increase in a work-from-home environment, which requires the default to be digital.

**User Advice:** Awareness and targeted usage within specific functional areas and industries is high (i.e., shared services, BPO deals, finance and accounting). However, there is still a large addressable market for a truly “industrialized” (repeatable, consistent, highly scaled) adoption as part of digitalized operations initiatives.

To maximize the benefits of RPA offerings:

- Understand that the starting point for your investment and overall choices needs to begin at the strategic design level; more specifically, with the overall architecture of the hyperautomation strategy, which includes a portfolio rather than one targeted technology. The overall approach and architecture for the automation of business and IT processes form the foundation that underpins workflow, efficiency, efficacy and business agility. Missteps are unforgiving, as processes are fossilized with far-reaching operational impacts.
- Ensure the use of multidisciplinary governance and coordination across business units, IT, security, sourcing and assurance functions.
- Stratify the overall portfolio of business stakeholder demand and build your hyperautomation roadmap. Determine the targeted role for RPA offerings within that strategic roadmap. The stratification of the portfolio will need to cut across several key variables: risk, reward, data profile (volume, velocity and viscosity of data) and business process profile (ranging from simple, well-defined rote examples to complex, SME-intensive, exception-heavy areas).

**Business Impact:** Experienced users of RPA have moved beyond simple, well-defined, highly repetitive use cases for their RPA software. Organizations are actively seeking to automate complex, subject matter expert (SME)-intensive, exception-heavy business processes. Thus, a majority of clients will demand that RPA vendors showcase functionality or partnerships across multiple automation technologies. These include process mining (also referred to as “process discovery” or “e-process mining”), ingestion engines (optical character recognition [OCR], computer vision and many other technologies), analytics, user experience and machine learning. The ability to integrate multiple automation technologies will be table stakes for RPA vendors to effectively compete and address the user demand.

Organizations will not want to invest in multiple RPA offerings, but rather select the one that has the most robust options for the largest array of use cases. Thus, the use of one or more of the complementary technologies — which Gartner refers to as the “hyperautomation technology portfolio” — will be considered a must-have ingredient for business process automation initiatives and will be the norm. The biggest user challenges will include how to architect the solution, vetting the maturity of the complementary technologies, determining how many vendors to utilize, sorting out the combinations of licensing and contracting options, and ongoing governance issues. Therefore, one of the critical variables that will determine the value of RPA-centric automation implementations will be the effective use and architecture of complementary technologies.

Clients focusing on RPA-centric initiatives rather than strategically analyzing the larger technology toolbox options — iBPMS, iPaaS platforms, LCAP and decision management systems — will find it challenging to deliver on the larger portfolio of business demands in the digital age.

**Benefit Rating:** High

**Market Penetration:** 20% to 50% of target audience

**Maturity:** Mature mainstream

**Sample Vendors:** AntWorks; Automation Anywhere; Blue Prism; Kofax; Microsoft; NICE; Pegasystems; SAP; UiPath; WorkFusion

## Field Service Workforce Optimization

**Analysis By:** Jim Robinson

**Definition:** Field service workforce optimization is the ability to optimize the planning and dispatch of complex teams of field service technicians. This is done through software algorithms and machine learning that incorporate technicians' skills, previous results, SLAs, issue severity, travel conditions, parts availability and business rules. This innovation profile is focused on field services performed on customer-owned equipment at a customer site, rather than on company-owned equipment in its physical plant.

**Position and Adoption Speed Justification:** The need to improve equipment uptime and optimize personnel utilization, fuel, overtime, shift coverage and travel time, as well as take in work demand from additional channels such as the Internet of Things (IoT), equipment asset management (EAM) and chat, is driving the adoption of optimization software and processes. New cloud-based applications have emerged; best-of-breed vendors have consolidated with larger organizations; and some older applications have been rewritten as web services that other applications can consume.

In low-volume scheduling cases, new optimization functionality included in some field service management (FSM) products is suitable. For complex cases, multivendor field service solutions (with an

FSM vendor and a workforce optimization vendor) are forming as CRM, ERP and best-of-breed FSM vendors partner with field service workforce optimization vendors.

Vendors will be challenged by demand for scalable, AI-driven scheduling, parts planning and skills matching, as well as long cycle and crew work support. In addition, tighter integration between field service teams and other teams (such as project, maintenance, installation and customer service) and dependence on data from IoT and GIS platforms will create new integration demands. Innovations in AI for parts recommendations, duration and cancellation prediction, and machine vision (among others) will increase the addressable market for field service workforce optimization solutions. The relative immaturity of these functions has slowed the overall progress of this Innovation Profile toward the Plateau of Productivity.

**User Advice:** If you meet the criteria of a complex field service organization, you need to evaluate field service workforce optimization. Complex organizations could be sized anywhere from 50 technicians in a single city to many thousands of technicians across a region. Technicians in these organizations often have a high degree of volatility in their schedules due to overruns, cancellations and urgent requests. These organizations perform multiple work orders per day, per technician, and can offer multiple types of services because of each technician's unique skill set.

Due to the complexity of specific industry models and vendor weaknesses, organizations should look at new implementations as signposts for a vendor's ability to execute. They should also compare functionality with the capabilities built into field service applications, new FSM add-ons for CRM applications, and partnership applications that may exist elsewhere in the organization, and that may already be integrated into other systems of record.

**Business Impact:** Field service workforce optimization addresses a business's need to:

- Reduce the number of dispatchers sending out field service technicians
- Handle more demand with the same base of technicians
- Lower the levels of spare-part inventories
- Improve the accuracy and communication of arrival times and statuses

These factors improve customer satisfaction and loyalty.

Organizations can improve profitability not only by decreasing costs, but also by increasing revenue through recommendations for additional service made by trusted technicians who are better informed about service history and manufacturer recommendations.

In addition to these benefits, organizations can use the data to build metrics and rank technicians, such as by the average time to complete tasks, the average utilization rates and the average first-time fix rates. This provides a means to identify star performers who can help improve the productivity of other technicians through training and mentoring.

**Benefit Rating:** High

**Market Penetration:** 20% to 50% of target audience

**Maturity:** Early mainstream

**Sample Vendors:** Accruent (Verisae); FLS; Geotab; IFS; Oracle; ServicePower

## Mobile Field Service Management

**Analysis By:** Jim Robinson

**Definition:** Mobile field service management digitizes technician mobilization, technician collaboration, work order debrief, site evidence capture and follow-up initiation. Field technicians use mobile devices to receive information and instructions for completing work orders at a customer site, and to capture the tasks completed, issues identified, time spent, parts used and equipment collected for depot repair. This facilitates customer equipment management, invoicing and agreement management. Mobile data stores enable operations while offline.

**Position and Adoption Speed Justification:** Field service technicians expect mobile apps to replace the entire function of the traditional paper work order and supporting paper forms and also enable digital support and collaboration. Technicians can capture traditional work order debrief items and site evidence, as well as initiate downstream workflows through quoting, parts requisition and equipment surveying functions on a mobile device.

Most field service management (FSM) vendors have a mobile offering that is integrated with FSM applications. Of the reference customers that Gartner recently surveyed as part of our Magic Quadrant research, 84% cited their FSM vendor's mobile application as either already in use by them or being deployed within the year.

Some organizations have chosen to develop apps in-house, which has slowed the pace of development for off-the-shelf solutions to improve user experience, offline function and integration. Also, the emergence of better underlying technologies has prompted many vendors to opt to rewrite their solutions. New entrants are providing faster time to market for features, but these new versions need to be vetted.

**User Advice:** Application leaders in organizations with technicians who service customer equipment in the field under contract, or on a time and materials basis, should evaluate options for field service mobile apps or risk losing competitive advantage.

Most mobile FSM apps help technicians communicate location and progress with the back office, other technicians and customers. But some are more robust in handling complexities such as task management, crews and parts sourcing. Application leaders should pace deployment by prioritizing use cases and measuring the impact on productivity, customer satisfaction and costs.

Some apps also integrate with GISs, knowledge management systems and other systems that better inform technicians of specific process steps or current infrastructure. This increases the likelihood that they will complete the work efficiently on the first visit.

Evaluate how well mobile field service apps integrate with your ERP and CRM systems. Check the strength of the development tools for integration, extensibility and configuration, and the technical expertise needed to use them.

Make sure your vendor can extend apps without writing code to accommodate your need for any forms or checklists that are not part of the standard offerings. Evaluate the vendor's live references to assess its ability to handle the nuances of processes that do not happen on every work order, but do happen regularly. The vendor's ability to do this will help reduce the number of apps and paper processes that each technician must endure.

**Business Impact:** The average reported time to ROI for field service solutions is 11 months, thanks in part to mobile-driven improvements in such areas as technician utilization, first-time fix rate and profitability. As organizations move away from

a capital equipment-based sales architecture and toward a service-based sales architecture to improve enterprise profitability and efficiency, mobile apps help inform the technician about useful information, such as the recent behavior of IoT-connected equipment, as well as service history. This helps the technician to identify and suggest additional products and services and thus act as a trusted advisor, which drives additional revenue and customer loyalty. Efficiently capturing the services performed and the SLAs that have been met, as well as providing detailed "before and after" evidence, also helps justify and extend premium contract pricing.

**Benefit Rating:** High

**Market Penetration:** 20% to 50% of target audience

**Maturity:** Early mainstream

**Sample Vendors:** IFS; Microsoft; Oracle; OverIT; Salesforce; SAP; ServiceMax

## Climbing the Slope

### Consumer Messaging Applications

**Analysis By:** Sandy Shen

**Definition:** Consumer messaging applications are chat apps that enable consumers to communicate among themselves or with an organization. Over the years, consumer messaging apps such as Facebook Messenger, LINE, WhatsApp and WeChat have developed tools to enable organizations to build user experience and better engage customers for wider business needs.

**Position and Adoption Speed Justification:** Consumer messaging applications have grown rapidly, with leading platforms reaching over one billion active users, and organizations find them effective channels to engage customers for a range of use cases that

include marketing, customer service and digital commerce. Employees such as sales and customer service are increasingly using these platforms to conveniently stay in touch with customers and be more responsive. This inevitably leads to security concerns as most of these platforms don't offer enterprise-grade security protection.

These messaging platforms are offering a range of tools for organizations to fulfill more business needs. For example, WeChat offers in-app messaging, embedded browsers; miniprograms along with official accounts for customer-facing offerings. Facebook Messenger and WhatsApp offer business tools to enable organizations to create profiles, manage chats and set up shops for commerce. Sophisticated implementations allow traffic generation from the messaging app to branded mobile apps where customers can pick up the conversation in the mobile app from where it is left off from the chat app. Except for commerce functions which are being piloted on most platforms, other functions have reached mainstream and are being adopted by most organizations for customer engagement.

**User Advice:** We recommend:

- Use consumer messaging applications to address the most common types of customer interactions such as account balance, order status, change notifications and customer service.
- When using messaging applications for commerce, limit the number of items in the shop and support the shop with marketing and advertising to make products more discoverable.
- Investigate the security practices of the underlying messaging platform and design mechanisms to fill the gap to comply with your organization's security policies. Acknowledge the fact that some messaging platforms don't offer enterprise-

grade security and have employee usage policies about not sending sensitive information such as customer or pricing data over those platforms.

- Explore various tools offered by messaging platforms to balance security controls with customer experience.

**Business Impact:** Consumer messaging applications are most used for customer service, digital commerce, and sales and marketing for B2C businesses but can be used for B2B as well to support direct sales and channel partners. Integrate messaging applications into your overall CRM and content management strategies to offer seamless experience between channels. Organizations which successfully leverage messaging applications will broaden the reach to existing and potential customers, generate traffic to their direct-to-customer channels (e.g., commerce sites, mobile apps and retail stores) and improve customer satisfaction and loyalty.

**Benefit Rating:** Moderate

**Market Penetration:** 20% to 50% of target audience

**Maturity:** Early mainstream

**Sample Vendors:** Facebook; Kik; LINE; Snap; Tencent (WeChat); Twitter; Viber; WhatsApp

## Customer Engagement Center

**Analysis By:** Nadine LeBlanc

**Definition:** A customer engagement center provides customer service and support functionality by engaging intelligently — both proactively and reactively — with customers by answering questions, solving problems and giving advice. The orchestration of intelligent customer processes through a CEC application is built around a case management

record and process and is typically delivered via a subscription service through a SaaS cloud-based model.

**Position and Adoption Speed Justification:** Over the past five years, Gartner has observed important changes in how organizations handle customer service. Whereas formerly a single department would respond to customers' needs, increasingly customer service is now a cross-departmental function that requires coordination. In order to support these changes, we observed a leap forward in investment and acquisition by larger customer engagement center (CEC) vendors in the areas of AI, conversational UI, hybrid integration, identity and access management, analytics and event-streaming. In many cases, functional innovation has moved toward deploying first to cloud-based CEC offerings and, then retrofit toward other deployment models.

There are several types of cloud deployment. The most popular version is SaaS multitenant model which means a software supplier that hosts one master version of the core application that is shared by many organizations with shared infrastructure. Some organizations also go away from this model by choosing a private instance of the software on public infrastructure. SaaS offerings accelerate the time to market and simplify IT demands. Reliability, functionality and integration complexity, and evidence of higher scalability, have improved. Many large-scale, complex customer service centers are transitioning to the cloud, however, some exceptions still apply for support centers in regulated industries, and/or complex real-time integrations and/or mission-critical infrastructure requirements. For this, hybrid deployments that connect on-premises and cloud will continue to exist. Gartner estimates that more than 75% of all new deployments of a CEC are in the cloud model. The remaining deployments will evolve to cloud over time as challenges from both the prospective buyer and the vendor, in specific regions where the

vendor doesn't have a data center or partner for data storage and retrieval, will get resolved.

**User Advice:** Many organizations are looking into connecting and synchronizing processes across multiple departments, including customer service, thus enabling the transfer of data among disparate applications and SaaS services.

There is a clear split in the market between the simpler types of CEC and the complex. In either cases, long-term costs have been poorly modeled by most enterprises:

- If you are not using cloud-based CEC, determine the probability that you will switch to a cloud-only CRM delivery model in the next five years and conduct scenario planning activities.
- Invest in CEC and related capabilities to enable faster change — such as prebuilt industry components, application PaaS, intelligent business process management, integration technology, augmented analytics, DevOps and agile deployment.
- Prioritize CEC use cases involving native AI and real-time automation capabilities. Accelerate time to value with complementary technology areas such as hybrid integration platforms (HIPs), master data management (MDM) and business process management (BPM).

**Business Impact:** Superior customer service is expected to be trusted, effortless and personalized while translating directly into better ROI and business outcomes. Technologies such as personal assistants and, social communities — when paired with the broad knowledge accessible in the public domain — will shift power to connected customers and put pressure on customer service organizations to do better. With the technology barriers lifted,

customer service organizations will be empowered to reinvent themselves. Cloud-based CEC available to the customer service organization, is a simpler deployment model that requires less from the central IT department in terms of resources and time. These benefits could accelerate these types of innovation.

**Benefit Rating:** High

**Market Penetration:** 20% to 50% of target audience

**Maturity:** Early mainstream

**Sample Vendors:** Microsoft; Oracle; Pegasystems; Salesforce; SAP; ServiceNow; Zendesk

## Proactive Communications Applications and Services

**Analysis By:** Drew Kraus

**Definition:** The term “proactive communications applications and services” refers to the use of outbound customer service communications to provide wholly or partly automated interactions with established customers, prospective clients and other interested parties via a variety of communication channels. Business rule engines, workflow and analytics tools are typically required to execute these applications and services, and advancements in AI and machine learning are expected to deliver advancements in customized campaigns and automated interactions.

**Position and Adoption Speed Justification:** As consumers are increasingly web- and mobile-savvy, they expect their preferred providers to “know” them and to anticipate their needs. Proactive communications applications and services extend beyond simple mass alerting and notification interactions to provide avenues for personalized and/or two-way customer service communications and transaction completion. Some high-profile uses of the

technology exist in the market today — for example, flight status notification systems from airlines, potential credit card fraud alerts and authentication solutions, and appointment confirmation systems for field service. Some leading-edge use cases include integration with location services (GPS) to determine if a particular user is close to a store or restaurant to enable the creation of context-aware, location-based applications that offer merchandise or services. This technology will reach mainstream adoption within five years. Companies that do repeat business with customers will be expected to support this technology within that time frame.

**User Advice:** Companies looking to differentiate by using innovative customer service technologies to strengthen customer loyalty, as well as looking to extend the capabilities of their customer engagement strategies while reducing customer service head count, should investigate proactive communications applications and services. These solutions tend to be a good fit for organizations with above-average digital maturity; those leveraging multiple channels and anticipating customer needs to achieve high levels of customer engagement. Example vertical markets include financial services, insurance, healthcare, telecommunications, and transportation among others. During the next five years, these applications and services will become more common and less of a differentiator, but their associated cost savings will help increase adoption by companies fitting the “mainstream” and “late adopter” profiles of technology adoption. Companies that have specific strategic industry or innovative requirements that cannot be met by packaged solutions on the market should consider developing solutions in-house, potentially leveraging component capabilities from cPaaS vendors.

Organizations developing their own proactive communications applications and services must ensure that the campaigns that they develop work

within communications and data protection laws such as GDPR, HIPAA and PCI among others.

Predictive and prescriptive analytics techniques delivered using machine learning and artificial intelligence hold the promise of better segmentation and decision making for proactive customer service interactions. Predictive content brings the potential of more relevant, timelier messaging and offers delivered to customers at their moment of need. The predictive accuracy of these capabilities can improve over time as more data is added to the models.

**Business Impact:** Proactive communications applications and services can enable faster responses to events and conditions. They can also improve sales, customer service and customer loyalty by anticipating customers' desire to be communicated with under specific conditions.

**Benefit Rating:** High

**Market Penetration:** 5% to 20% of target audience

**Maturity:** Early mainstream

**Sample Vendors:** Adobe; Amazon Connect; ContactEngine; Genesys; Nuance; Salesforce; Twilio; West; [24]7.ai

## Contact Center as a Service

**Analysis By:** Steve Blood; Drew Kraus

**Definition:** Contact center as a service (CCaaS) is a cloud-based application service platform that enables customer service organizations to manage multichannel customer interactions holistically with prepackaged applications to support customers and employee engagement. CCaaS solutions are used by organizations that need to manage front-office operations such as customer service, telemarketing and employee service and support centers.

**Position and Adoption Speed Justification:** CCaaS maturity moves to preplateau this year as the worldwide pandemic in 2020 tests the promise of agility and scalability. While it's not only CCaaS providers that have enabled organizations to move their customer service employees to home, clearly the design intent of cloud contact center to connect employees independent of network infrastructure has been well-respected by customers. CCaaS is considered mainstream technology with organizations now having the confidence to implement to thousands of customer service seats. Few organizations we speak with see premises-based technology as strategic investments, though some with larger deployments of user may be slower to migrate to cloud services because of the cost of reorientating staff to new platforms.

The services offered by CCaaS providers are now extending beyond the "getting connected" pillar of customer service, with native capabilities for workforce engagement management and customer analytics capabilities as well as a marketplace ecosystem of partners and APIs. Service-level framework agreements are maturing with some offering guarantees for voice quality. Leading providers have launched customer and partner communities to develop peer connection. Multiexperience will play an increasingly important role in defining customer experience as voice becomes another modality in a digital engagement platform.

**User Advice:** Companies looking to launch new contact center operations, or those that need to replace out-of-maintenance server-based systems but still reduce capital expenditure, are likely to find CCaaS offerings a good fit. Companies that have strong seasonality in their business operations, and that need to scale agent counts up and down throughout the year, also find these solutions desirable. Consumption-based billing based on cost per call or transaction is starting to emerge, enabling organizations to add commercial flexibility to their new

requirements. However, there are also potential risks associated with CCaaS, especially where organizations are not already cloud-centric in their application approach. Here organizations need to ensure sufficient resilience of network connectivity between the enterprise WAN and cloud service provider — see “How to Manage SaaS Performance When SLAs Remain Immature.”

Enterprises should first consider CCaaS solutions as an alternative to premises-based technology, particularly for new or updated multichannel deployments where license elasticity supports business agility requirements. Specifically organizations should be considering how CCaaS can add a greater level of business continuity for pandemic and other scenarios where remote working will become an important part of the employee work mix. Organizations still in the planning phase for cloud should be signing their last maintenance renewal for customer-premises technology.

**Business Impact:** CCaaS provides an alternative business model for addressing an enterprise’s contact center requirements. It is particularly useful for customers with rapid growth requirements or fluctuations in staffing in response to seasonal business demands or continuity needs, and for customers seeking a periodic operational expense payment or subscription model, rather than a capital expenditure purchase model. These solutions are also a good fit for companies that do not want to dedicate IT staff to supporting infrastructure that is not core to their primary product or service.

**Benefit Rating:** Moderate

**Market Penetration:** More than 50% of target audience

**Maturity:** Early mainstream

**Sample Vendors:** Amazon Connect; Content Guru; Five9; Genesys; NICE inContact; Prosodie-Capgemini; Puzzel; Serenova; Talkdesk

## Entering the Plateau

### Work-From-Home Agent Technology

**Analysis By:** Drew Kraus

**Definition:** Work-from-home (WFH) agent technology enables contact centers to station some or all of their agents at home, in other off-site locations or in small satellite centers. Solutions may include a VPN connection, via broadband, to agents’ locations, as well as a thin- or web-client agent desktop interface, to provide agents with access to CRM and contact center call control features. A voice path is typically provided by voice over IP (VoIP) technology over a VPN connection or a plain old telephone service (POTS) line.

#### **Position and Adoption Speed Justification:**

Deployment of WFH agents has been considered a mainstream practice for many contact centers for many years, especially in locations where broadband services are widely available and reliable. Almost all major vendors of on-premises and cloud-based contact center platforms support WFH agent technology.

Cloud-based solutions, however, are inherently more adaptable to WFH scenarios, as they have been architected to support agents remote from the system. Contact center as a service providers report that over 70% of their agent connections are over the internet. Additionally, WFH solutions have gained greater market recognition as a result of the coronavirus pandemic, which has forced even companies that have long been strongly averse to WFH deployments to rapidly roll out WFH solutions for most or all of their agents. Although WFH technology had been considered mainstream and past the Plateau of Productivity, the

broad market focus on WFH solutions in response to the pandemic warrants a return to the Hype Cycle.

**User Advice:** Supporting WFH agents via a desktop client interface can be problematic, for a variety of reasons. These include challenges with pushing out software updates, the difficulty of ensuring that the use of other applications does not slow the performance of agents' systems, and security concerns associated with customer data residing on agents' PCs. As a result, most contact centers supporting WFH agents strongly prefer to use thin-client agent interfaces, such as those that are web-based or virtualized via Citrix (although the latter may create quality-of-service challenges).

VoIP over broadband links can provide voice quality as good as, or better than, that of mobile phones. VoIP quality can be improved by routing the voice traffic to a dedicated VoIP hard phone or appliance. Companies that need even higher-quality connections often choose to send the voice traffic over a POTS connection. In this case, agents typically log on to the contact center system via their agent desktop tool. The system then makes a call to the agents' designated phone numbers, and keeps those connections up for the duration of the agents' shifts. Agents are alerted to new incoming or outgoing calls by a zip tone.

In addition to ensuring that WFH agents have reliable broadband service and, if needed, telephony service, organizations must ensure that these agents have home-office space that is free of typical household distractions and noises. Consequently, some organizations are bringing some of their contact center agents back into the office, while maintaining social distancing.

**Business Impact:** The pandemic has forced most contact centers to support WFH agents, at least temporarily. Many are considering allowing at least

some of their agents to continue working from home even after the health crisis abates.

WFH programs can reduce real-estate costs when staffing levels grow beyond a site's physical capacity. They can support flexible working in relation to "off hours" and seasonal or other spikes in call volume. They can accommodate workers with disabilities who may have difficulty commuting to work. They can also enable employees who have contagious illnesses, such as the common cold, but who are well enough to work, to do so safely. Permitting a small number of employees to work at home each week, on a regular cycle, helps ensure that all are comfortable with the demands of remote working.

Permission to work from home on a full- or part-time basis can be offered as a benefit to agents, to reduce their costs and the amount of time they spend commuting. Support for home working can also enable a company to recruit agents from a wider area, which could make it easier to hire agents with scarce skills. Furthermore, some agents will be willing to accept lower pay in order to work from home.

Many organizations may have effectively been forced to adopt WFH contact center technology in response to the pandemic, but the experience will leave them better prepared to maintain business continuity during any future disaster.

**Benefit Rating:** High

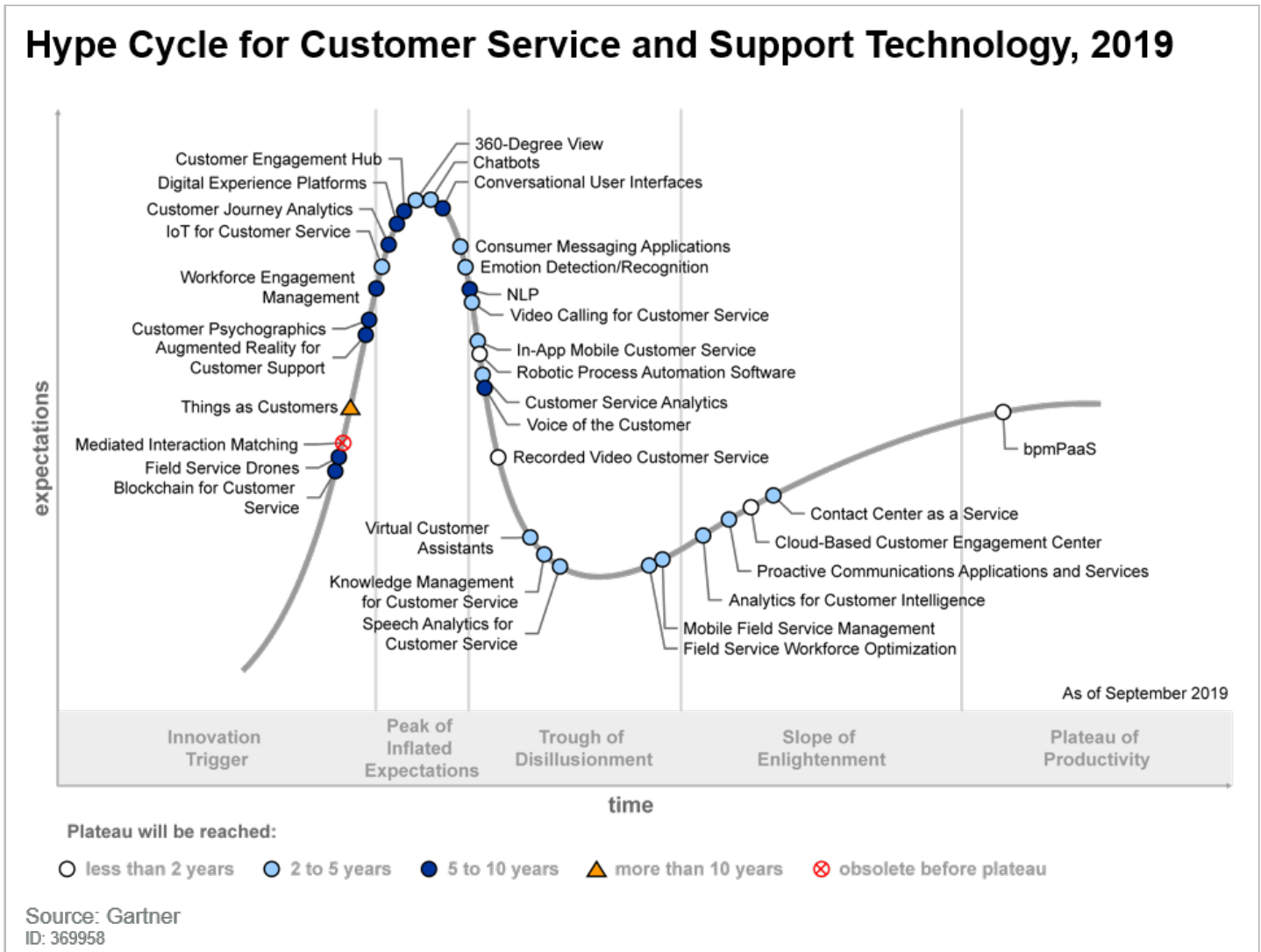
**Market Penetration:** More than 50% of target audience

**Maturity:** Mature mainstream

**Sample Vendors:** 8x8; Aspect; Avaya; Cisco; Five9; Genesys; Mitel; NICE inContact; Serenova; Talkdesk

## Appendixes

Figure 3. Hype Cycle for Customer Service and Support Technologies, 2019



## Hype Cycle Phases, Benefit Ratings and Maturity Levels

**Table 1. Hype Cycle Phases**

Phase	Definition
Innovation Trigger	A breakthrough public demonstration, product launch or other event generates significant press and industry interest.
Peak of Inflated Expectations	During this phase of overenthusiasm and unrealistic projections, a flurry of well-publicized activity by technology leaders results in some successes, but more failures, as the technology is pushed to its limits. The only enterprises making money are conference organizers and magazine publishers.
Trough of Disillusionment	Because the technology does not live up to its overinflated expectations, it rapidly becomes unfashionable. Media interest wanes, except for a few cautionary tales.
Slope of Enlightenment	Focused experimentation and solid hard work by an increasingly diverse range of organizations lead to a true understanding of the technology's applicability, risks and benefits. Commercial off-the-shelf methodologies and tools ease the development process.
Plateau of Productivity	The real-world benefits of the technology are demonstrated and accepted. Tools and methodologies are increasingly stable as they enter their second and third generations. Growing numbers of organizations feel comfortable with the reduced level of risk; the rapid growth phase of adoption begins. Approximately 20% of the technology's target audience has adopted or is adopting the technology as it enters this phase.
Years to Mainstream Adoption	The time required for the technology to reach the Plateau of Productivity.
Source: Gartner (August 2020)	

**Table 2. Benefit Ratings**

Benefit Rating	Definition
Transformational	Enables new ways of doing business across industries that will result in major shifts in industry dynamics
High	Enables new ways of performing horizontal or vertical processes that will result in significantly increased revenue or cost savings for an enterprise
Moderate	Provides incremental improvements to established processes that will result in increased revenue or cost savings for an enterprise
Low	Slightly improves processes (for example, improved user experience) that will be difficult to translate into increased revenue or cost savings
Source: Gartner (August 2020)	

**Table 3. Maturity Levels**

<b>Maturity Level</b>	<b>Status</b>	<b>Products/Vendors</b>
Embryonic	• In labs	None
Emerging	• Commercialization by vendors  Pilots and deployments by industry leaders	First generation High price Much customization
Adolescent	• Maturing technology capabilities and process understanding Uptake beyond early adopters	Second generation Less customization
Early mainstream	• Proven technology Vendors, technology and adoption rapidly evolving	Third generation More out-of-the-box methodologies
Mature mainstream	• Robust technology Not much evolution in vendors or technology	Several dominant vendors
Legacy	• Not appropriate for new developments Cost of migration constrains replacement	Maintenance revenue focus
Obsolete	• Rarely used	Used/resale market only
Source: Gartner (August 2020)		

## Evidence

### Gartner's Customer Experience Innovation 2020 Survey

Results presented are based on a Gartner study conducted to understand priorities, working relationships and responses to situations faced in CX initiatives. This primary research was conducted online from 17 January through 24 February 2020, and in late April 2020 (for recontact for three questions), among 238 respondents in North America, Western Europe and Asia/Pacific.

Companies were screened for having a minimum of \$50 million in worldwide annual revenue for the last fiscal year and a minimum of 250 employees worldwide. The sample represented organizations in the U.S. (n = 53), Canada (n = 8), the U.K. (n = 57), India (n = 30), Singapore (n = 31) and Australia/New Zealand (n = 59).

To qualify respondents had to be in charge of the setting of strategic objectives and priorities for at least one CX-related project activity (85% of respondents) or on a team responsible for meeting strategic objectives and priorities (15%). They also had to be knowledgeable about business priorities and/or business benefits for at least one CX project in the past year, and spend more than 25% of their typical workday on CX improvement projects.

Quotas were applied for countries, industries, roles, involvement in CX and annual revenue.

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