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# Communicating with Your Customers

## The Evolution of Conversational AI

Vivian Lee, Brian Loveys, Aameek Singh & Robert Yates

REPORT

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## *The Evolution of Conversational AI*

*Vivian Lee, Brian Loveys,*
*Aameek Singh, and Robert Yates*

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**Communicating with Your Customers**
by Vivian Lee, Brian Loveys, Aameek Singh, and Robert Yates



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# Communicating with Your Customers: The Evolution of Conversational AI

This report educates customer service executives and line-of-business professionals about the market opportunity for conversational artificial intelligence (AI). It aims to equip decision makers with actionable intelligence on how their enterprise peers are applying conversational AI and how they can integrate it into their business today. This report, written by IBM's conversational AI experts who are developing, building and working with the technology every day, also shares insights on where conversational AI is going next.

## Introduction

This age of instant communication is a boon to many. With just a few taps or clicks, we can easily contact friends, share ideas (and get immediate validation) and track our food, drivers, and packages. We're also able to contact places of business, any time and anywhere. This shifting dynamic has clear benefits for the customer, and many organizations are being forced to transform or risk becoming obsolete. Take, for example, the call center.

Customer service call centers do not function as they once did, acting as a one-stop-shop for all inquiries, whether it's verifying account information, transferring money, or initiating a return. These tasks are now easy for consumers to handle on their own via their smartphone or computer. And if they need help with an

inquiry, very few consumers are rushing to dial a customer service number—they are seeking a resolution where they are, as quickly as possible.

If your organization has a more traditional call center, you understand this on an intrinsic level. You might find that competing in this changing landscape can be overwhelming. Organizations worldwide are looking to modernize their customer service approach, seeking a strategy to increase operational performance and still provide the high-touch experience that customers crave.

Many industry leaders are finding that they have no choice but to engage with customers from a service point of view rather than a product-centric one. Because it takes only one bad interaction for a customer to abandon a service, businesses are no longer just competing with other companies' products, they're competing with a customer's last service experience, so it behooves every organization to deliver the white-glove experience customers are looking for.

This seismic shift in customer care is being driven by AI and the ease and access of the cloud. There is a new opportunity in this market—*conversational AI*—for organizations to build conversational interfaces into any application, device or channel, thus empowering customers to interact with companies whenever and wherever they feel most comfortable.

Let's first quickly review the history of conversational AI and explore the current landscape before diving into the ways technology can improve your customer and employee experience.

## From Chatbots to Virtual Assistants: The Conversational AI Landscape

Alan Turing's legendary article "Computing Machinery and Intelligence" was published in 1950, and computer scientists have spent the past 70 years chasing his dream of building a computer that could successfully "pass the Turing test"—that is, impersonate a human accurately enough to fool a human judge.

In 1966, Joseph Weizenbaum's ELIZA program fooled users into believing they were talking to a person. This primitive bot was fed a script of responses to specific keywords that users might input. The bot wasn't by any definition "thinking" for itself. It was just spitting

out preprogrammed responses, but it was convincing enough to fool people that they were speaking with a thinking machine.

In 1994, Michael Mauldin, the founder of Lycos, developed a "chatterbot" named Julia, which, in addition to conversing, could take notes, relay messages, and play games with users. At the turn of the millennium, a company called ActiveBuddy developed a chatbot called Smarterchild which operated through instant messaging. Smarterchild could crawl databases in order to provide users with news, weather, financial data, movie times, and more. It was during this era that commercial applications of chatbots began to be realized. ActiveBuddy sold chatbot services to several brands that used its software to develop custom chatbot experiences for customers. But it wasn't until well into the smartphone era that conversational AI came to be seen as much more than a novelty. It harnessed the computing power of smartphones to drive the natural language processing technology that was making chatbots more powerful. And it didn't hurt that people had already spent a century talking into telephones.

In 2010, conversational AI burst into the consumer mainstream with new AI assistants popping up on phones, in smart home devices, and on social networks. These platforms introduced the mainstream population to conversational AI and made them comfortable carrying it around in their pocket.

## The Rise of Conversational AI for the Enterprise

In 2019, the golden age of conversational AI for consumers is in full swing. But even more exciting is the opportunity it presents for the enterprise. The emergence of data processing tools and machine learning capabilities have made widespread adoption of AI technically possible. Meanwhile, the global proliferation of consumer-facing AI platforms has helped everyday consumers understand that AI is the future.

From tech startups to government services, organizations are already taking advantage of the power of conversational AI to improve their customer experience. Here are three common—and successful—ways we've seen enterprises adopt conversational AI:

*Customer-facing AI assistants*
: Sophisticated AI assistants interact with customers directly in the absence of a human agent. They often act as a first line of defense for customer queries, fielding simple questions and forwarding complex problems on to human agents who are better suited to handle them.

*Agent-supporting AI assistants*
: Human customer service agents use AI assistants to support them while they are interacting with customers. For example, an agent can use an AI assistant to look up answers to a request within an internal database. The assistant can crawl the database much more quickly than the agent's manual search could, and can surface answers to the agent. This allows the agent to focus on delivering the uniquely human service that they are able to give without wasting time searching through databases and documents. It's a win for the customer, who is treated to much faster response times, and for the agent, who can avoid the drudgery of searching and instead focus on the human touch.

*Internal employee–facing assistants*
: AI assistants help employees perform activities that don't involve customer interaction. These assistants can help employees find information about company policies, resolve basic HR inquiries, and even submit IT ticket requests.

Enterprises have much to gain from implementing conversational AI across these three categories. The most obvious benefit is increased customer satisfaction. The days of conversational AI being perceived by users as a pale imitation of human interaction are over. Interminable wait times are also becoming a thing of the past. Employees appreciate being able to work alongside assistants because it means the employees can focus on high-level problems that take better advantage of their cognitive abilities. An assistant can also remember every interaction a customer has had with the company, including previous conversations, and then apply that knowledge during a new interaction.

AI assistants can work around the clock—making themselves available whenever the customer needs help and offering support during "off hours" when a human agent is off the clock. Assistants equipped with automated routing can answer initial queries and categorize and assign the ticket for further action accurately, instantaneously

reducing the time that customers are transferred between departments. Not only does this increase customer satisfaction, but it allows agents to focus on higher-value-added work.

## The Evolution from Basic Chatbots to Advanced Conversational AI

In the early days of conversational AI, a user would ask a question, and the bot would translate this into a query based on the instruction set the chatbot was trained on. The bot could only access a prewritten script and associate it with keywords in the query. It wouldn't be able to apply context and would ignore factors outside of the query itself that might enable it to give a higher-quality answer. For example, is the user a new customer? Is she a happy customer, based on her language? The bot also wouldn't be able to store the interaction and then translate it into other systems, such as a Customer Relationship Management (CRM) platform.

As conversational AI has evolved, it *can* now apply context. An assistant can access and "learn from" hundreds, if not thousands, of customer touchpoints. When integrated with other capabilities, an assistant can understand every product a user has ever viewed on the retail website, every item they've ever returned, every complaint they've ever made. It can share this data with other systems in an integrated way so that the customer enjoys a consistent experience that takes full advantage of their many interactions with the company. The customer is made to feel that the company "knows" them.

Today's AI platforms allow for contextual bias and can understand a wider range of language inputs, or even emotional or tonal moods. Current research is making great strides in natural language understanding, which allow bots to engage with users in more complex ways that don't feel meticulously scripted by engineers using if-then rules. Assistants are now able to understand broad, open-ended questions like "What kind of car should I buy?" or "Why haven't I gotten my package yet?" as opposed to narrow questions with concrete answers like "What time is it?"

As AI spreads throughout every possible industry, supercharging the backend of enterprise, most people will begin to use new AI tools without even realizing it. These applications will manifest more rapidly than will highly conspicuous examples of AI such as

driverless vehicles. New innovations will be driven by machine learning in software environments rather than by hardware upgrades. The best AI experiences won't feel like talking to a robot from *Star Trek*—they'll just feel like the most satisfying customer service experience you've ever had.

Next, we're going to take a look at today's customer—and how conversational AI can help—before turning our attention to the agent and employee experiences.

## Understanding Today's Customer

Today's consumers expect more from customer service than any previous generation has. The new generation demands quality service, anytime, anywhere, and on any channel they choose. They're vocal about the service they receive, sharing both good and bad experiences widely and, thanks to social media, publicly. If they don't receive immediate support, they take their business elsewhere. Unsatisfied customers will not return to a business if they don't feel each interaction is efficient or tailored to their needs.

According to Forrester, 73% of US consumers say "valuing their time" is the most important thing a brand can do. Yet 50% of customer calls go unanswered or require escalation—per the IBM Institute for Business Value. Consumers become frustrated when simple issues cannot be resolved without long wait times or seemingly endless interactions.

Research shows that poor customer service results in an estimated $62 billion in lost sales in the United States alone. It's not difficult to imagine why. Existing customers are jumping ship after challenging experiences, and attracting new customers is becoming increasingly difficult.

Depending on your industry, acquiring a new customer is anywhere from 5 to 25 times more expensive than retaining an existing customer. To put it another way, a 5% increase in customer retention has the same effect as increasing profits by 25%. Improving the customer experience to retain existing customers *and* attract new ones should be an organizations' top priority. As the pressure to retain customers grows, so does conventional customer support overhead. Companies spend thousands to hire call agents—at least $4,000 per employee, with an additional base cost of $4,800 to train each

employee. These skyrocketing costs, coupled with a 30% average employee turnover in US call centers, negatively affects the bottom line.

Organizations must automate critical parts of the customer service function to stay afloat—but this is often at the expense of a positive customer experience, an area in which they can't afford any additional losses. Customers are encountering poorly trained chatbots that short-circuit when asked a strangely worded question and phone system labyrinths where a live agent is nowhere to be found. These solutions add more friction rather than ease customer pain points.

This is where robust conversational AI can help.

## Enhancing Customer Service with Conversational AI

With conversational AI, organizations can automate their customer service experience while empowering customers and human agents. With the right AI tools in place, a customer service interaction becomes a seamless experience.

Advanced conversational AI involves more than a basic chatbot. It empowers organizations to build conversational interfaces into any application, device, or channel. Most chatbots try to mimic human interactions, which can frustrate users when a misunderstanding arises. Conversational AI does more.

Customers can ask questions in a natural language within a human-friendly interface. Conversational AI knows when to search for an answer from a knowledge base, when to ask for clarity, and when to direct you to a human. It can meet your customers where they are, whether that's on your company's mobile app, on Facebook Messenger, or on your website.

If a customer needs help at 8:05 p.m., after agents sign off at 8:00 p.m., an AI assistant can jump in. Customers can get quick answers to questions and don't need to wait until the next morning for a simple response. Plus, an AI assistant never forgets, giving customers the consistent experience they want. As you train your AI assistant over time, it will become smarter and better equipped to handle additional inquiries.

For customers, the benefits of a self-service customer-facing AI assistant include the following:

- A single point of assistance, empowering customers to answer straightforward questions that would have previously required an agent's help
- Communication on their channel of choice—web browser, mobile app, social platform, or even the phone—ensuring that they can solve questions wherever they are
- Behind-the-scenes integration with your organization's support documents and CRM systems, which translates to more personalized responses for customers based on past interactions
- Seamless escalation of tougher questions to live agents empowered to make a human connection for high-quality service

## Understanding Today's Customer Service Agents

Imagine that you need to make a last-minute change to your flight plans. You need to change the date and flight destination, but you also need to make sure the flight is equipped with WiFi and that it can accommodate your beloved German Shepherd. You don't want to speak with a machine; you need to talk to someone who can understand the complexity of your problem.

A customer service agent answers your call. They easily handle your flight change—but as for the dog and the WiFi, they need to forward you to a different department. So, you wait a little bit. The agent that comes on the line is able to confirm about the WiFi, but they need to check with their manager about the unusually large dog. You wait some more—it's been 25 minutes by this point.

Finally, the agent returns with a snippet of script from a knowledge base: "We allow dogs and cats to be transported as cargo on a first-come basis. Up to two pets per passenger that are at least eight weeks old." Unfortunately, this does not answer your question definitively. Can't they understand that this is an unusually large dog? You don't want to arrive at the airport only to be turned away at the gate. You're frustrated, and the agent is frustrated with their inability to help—ultimately you decide to cancel the flight. You've had a

terrible customer experience, and you're already looking up other airlines.

We can all relate to examples like that. Agent-assist technology has advanced considerably over the past decade, but there are still times when we'd really prefer to speak with a human. Automated assistants can fail when they haven't been "taught" how to handle an uncommon or complex query. For now, there are outlier inputs that tend to trip up automated assistants, and even the most advanced technology in the world can't fully substitute for the highly sensitive and tailored approach of a capable human agent.

Unfortunately, although human agents are less susceptible to becoming "stuck" on a complex query and are better at providing a range of emotion that results in a higher-fidelity conversation, they suffer from a number of pain points:

*Limited access to information*
: Sometimes, agents lack training or don't have access to comprehensive knowledge bases, or those knowledge bases aren't set up to be queried quickly. Sometimes, the knowledge bases are outdated and contain information that's no longer correct or relevant. Currently, on average, in a six-minute customer service call, four and a half of those minutes are devoted to agents doing manual research. No matter how capable the agent, it takes precious time to scan through a knowledge base, and manual searching can result in hurried, inaccurate responses. According to IBM research, 61% of failed customer support calls could have been solved with better access to data. These delays and inaccuracies can and do negatively affect the customer experience. 34% percent of contact-center decision makers indicate they don't have a knowledge management solution at all.

*Call transferring*
: One of the most frustrating experiences for a customer is having to explain oneself several times in succession to multiple agents. This unfortunate scenario occurs when a call needs to be bumped up to a manager or to a different department possessing specialized information. Agents are also frustrated when this happens because it means spending their time bogged down in redundant tasks like taking down customer information.

*Burnout*

> Customer service is known for its high turnover rate. That's partially due to agents having to field the same queries over and over, and spending a considerable amount of time simply searching for the information they need to successfully handle a customer interaction. Customers become more frustrated with them with every passing minute, and they take out their frustrations on the agent, even if the agent is doing their best. This contributes to agent attrition, which can run as high as 30%.

Conversational AI presents solutions for these pain points.

## Empowering Customer Service Agents with Conversational AI

Because customer service agents often represent the only one-to-one contact customers ever have with businesses, it's critical that agents have all the support that technology affords in order to ensure quality customer experiences.

With conversational AI, the agent can benefit from an automated assistant that understands natural language. Just as customers query AI assistants, so too can agents, helping them improve productivity and the quality of the interaction for the customer. This best-of-both-worlds scenario involves a human and a machine working side by side. Agents can spend their days solving complex problems and providing a "human touch" to customer interactions with a wide range of emotion, empathy, and humor, among other distinctly human traits. Meanwhile, the AI can do what it does best: crawling knowledge bases and delivering information quickly and accurately. The customer gets the high fidelity of a human conversation, plus the expedience and accuracy of the machine.

Agents can search FAQs and knowledge bases using the same plain human language they've been speaking all their lives, enabling them to respond more quickly. Agents are less likely to have to transfer a call because they have a broader range of accessible information at their disposal. Plus, an automated assistant can keep them abreast of the customer's prior engagements with the company from all previous customer service interactions.

In some circumstances, agents can actually hand the reins of the conversation over to the automated assistant, allowing it to resolve

simple problems or answer questions. Then, if the conversation becomes overly complex, tangential, or if the customer becomes frustrated, the agent can take back control and provide the high-level support they're uniquely equipped to provide. These transitions can be perfectly seamless—the customer doesn't realize a transition has taken place.

When agents are better equipped to solve customer problems and spend less time trawling through documentation searching for answers, they can instead devote their time to solving more interesting problems and making the customer feel valued. This can boost agent morale and cut down drastically on agent attrition. Agents feel like they have a greater command of the information, and therefore that they have more to offer the company and the customer. Far from rendering agents obsolete, conversational AI helps them do their jobs better.

## Empowering Employees Across the Organization

The benefits of conversational AI don't end with customers and customer service agents. Your employees, and your bottom line, will see a difference, as well. Customer support use cases might be more common, but AI-powered employee assistants can have an equal impact.

Employees want quick access to information and services, and most organizations don't make this easy. Simple questions like "How many vacation days do I have left?" and "How can I reset my password?" can be absurdly difficult to find answers for.

When seeking answers for basic questions like "who does Bob report to?" employees spend too much time combing intranets only to find lengthy, often outdated documents—if they find anything at all. Employees might then turn to an internal help desk to find information, but these are not often as well funded as their external counterparts. On average, it takes more than 24 hours to receive a response to a support ticket. In the meantime, employees often reach out to subject matter experts, such as HR professionals and product developers, to ask their simple questions. These support pros are inundated with requests, handling an average of four to five hundred support tickets a month.

Employees and internal experts alike are frustrated by this process, and organizations are tapping AI assistants to address the challenge. Conversational AI is empowering employees to refrain from combing through corporate intranets or contacting HR or IT professionals, saving countless work hours and costs.

We often see organizations building assistants in a specific domain, but some cutting-edge companies are building employee assistants that can act as the core hub for information. As technology evolves, conversational AI will also be embedded directly into employee workflows and support employees as they work, rather than just answer questions about how to do the work. For example, if a manager needs to transfer an employee to a new department, the AI assistant would be able to execute the transfer

## Conversational AI in the Enterprise: Success Stories

Imagine a major national bank—let's call it ABC Bank—with thousands of branches scattered around the country. Each day, hundreds of customers stream into each branch location and approach branch employees to ask for help. Each customer expects the branch employee to answer their question or facilitate a transaction so that they can go about their day. No matter how specific the question is or how obscure the request, the branch worker is the expert and *must* be able to help. At least that's how the customer sees it.

For the branch worker—who might receive hundreds of questions each day about countless bank offerings—finding a resolution isn't always so simple. In many situations, a branch worker needs to find a colleague who can help or even call into a central office for guidance. But remember, this is a national bank chain with thousands of branches. Thousands of branch workers are calling in to the central office, waiting on the line for answers. All the while, customers are standing in front of the branch workers, growing more frustrated with each passing second.

Fast forward 10 minutes: the branch employee shares the answer with the customer. The issue is resolved, though neither party is satisfied with the interaction. But wait, there's more. The customer has a follow-up question about extending their credit limit. Despite the last interaction, the customer is hopeful that this is a simple request.

Alas, the cycle begins again—the branch worker is back on the phone, waiting to connect to the call center agent. What the customer assumed would be a 10-minute trip to the bank has turned into a 30-minute ordeal.

Now, imagine how different this interaction would be if the bank adopted conversational AI. What if the AI assistant worked hand-in-hand with branch staffers, supporting them as they answered client questions? The experience would feel incredibly different for the customer and the employee. It would no longer be a transaction, but a more engaging experience for all parties involved.

## From Lengthy Transaction to Engaging Interaction: Improving the In-Person Experience

ABC Bank, which represents a real major national bank, adopted conversational AI to improve its customer and employee experience and, in turn, scale its reach and grow its client base.

ABC Bank believed looking at growth opportunities outside its national market was critical to its long-term business strategy. Yet scaling its business without addressing the pain points of millions of existing customers would be nearly impossible. Like many banks, ABC Bank's clientele wanted a seamless online and in-branch experience that was personalized and efficient.

First, ABC Bank turned its attention to the in-branch experience. Each day, branch employees responded to customer requests about the bank's 60-plus product lines, spanning insurance, pension plans, credit card services, savings bonds, and more. ABC Bank saw an opportunity to better support branch employees by introducing conversational AI.

The bank launched a branch worker-facing AI assistant that could answer hundreds of thousands of questions per month with a 95% accuracy rate. The bank's thousands of branch staffers now had the added support of an AI assistant that they could chat with in natural language as they were face to face with customers. The assistant knew the ins and outs of the bank's myriad products and services. It quickly became a trusted companion for agents as they helped customers, no matter how complex the question.

ABC Bank's use of conversational AI led to measurable growth: current clients noticed the improved service, which helped to attract new clients—and the bank continued to scale.

## Adding AI Assistants to the Online Customer Experience

After the success of its branch worker–facing AI assistant, ABC Bank turned its attention to empowering its customers with self-service tools. The company saw an opportunity to enhance its digital presence by adding an AI assistant to its already popular mobile app.

By bringing AI to the front lines, ABC Bank enabled customers to resolve common requests without a branch employee—a relief for customers and employees alike. One of the most frequently asked questions was, "How do I register a token for my mobile phone?" ABC Bank's AI assistant was able to walk customers through the process remotely, saving them a trip to a branch and rescuing branch professionals from spending their days on monotonous, repetitive tasks like setting up tokens on mobile phones.

ABC Bank's AI assistant helped existing customers navigate the app and complete basic functions like checking balances, making transfers, and paying bills, but it also acted as a point of entry for new customers. ABC Bank had begun meeting customers where they wanted to be while still driving growth. At the end of 2018, among the most popular customer questions was how to open a new bank account—in fact, 78,000 new accounts were opened via ABC Bank's mobile app. The AI assistant also helped customers apply for loans and invest their funds.

The possibilities for growth don't end here. Already on the cutting edge of conversational AI adoption, ABC Bank is now considering integrating voice into the customer-facing AI assistant. This capability could lower the barrier to entry for customers and prospects who are not tech-savvy. It could provide a more convenient experience for on-the-go clients who prefer to ask questions verbally instead of typing them.

# Beyond Banking: Bringing the Benefits of Conversational AI to Your Industry

ABC Bank is just one example of how an organization can implement—and scale—conversational AI to improve the customer and

employee experience. Although approaches can vary, enterprises across industries are applying conversational AI to improve the customer experience and boost the bottom line.

Insurers have found success with conversational AI by creating virtual sales assistants, which help financial consultants facilitate better interactions with customers and prospects. An AI assistant can help an insurer's workforce stay informed on their ever-changing catalog of offerings—whether an employee has been on the job for one day or a decade. Human agents are equipped with up-to-date information on products and services and can pair customers with the best coverage for their needs.

Telecommunications companies large and small are adopting a similar approach for customer service and sales professionals. An AI assistant acts as a companion to human agents who field inbound calls from customers who ask questions about a wide array of offerings. In the case of one telco provider, these questions could involve anything from upgrading a mobile phone's data plan, to comparing traditional cable versus digital streaming packages, to understanding internet service offerings. Coupled with a customer-facing AI assistant that allows customers to service themselves, telco providers are offering a more seamless customer experience. This approach is critical in an industry that is typically plagued with customer service woes.

Any organization that is looking to improve its customer experience and facilitate more open, engaging communication with customers can benefit from adopting conversational AI. Government and federal entities are using AI assistants to answer questions about processes such as filing taxes or accessing city programs; retailers are integrating conversational AI into the digital experience to accompany customers as they browse their websites; airlines are equipping human agents with AI assistants to field inbound inquiries from harried customers looking to change flights.

## What's Next for Conversational AI?

The next few years will be characterized by a pair of interrelated trends in conversational AI that will disrupt every B2C industry, from retail to health care to public services. The near-term trend is a convergence of channels and platforms, but in the (not-too-distant) future, conversational AI will behave more and more like a human.

## An Ocean of Touchpoints

Many of today's automated assistants operate in closed systems. A customer's interactions with an AI assistant are limited to a single platform. This can result in the frustrating experience of a customer having to repeat themselves to multiple agents. This is also a missed opportunity for the company, because these conversations ideally would be integrated into a broader CRM platform.

Conversational AI promises a future in which data from every interaction you've ever had with a company—every click on its website, every mobile app behavior, every customer service call, every purchase—will be gathered and integrated into one platform. As a result, companies will be able to provide comprehensive nurture streams that feed into an unprecedented level of individualized customer service.

For this shift toward true omnichannel to occur, companies will need to push for standardization of protocols between various channels. In other words, all of these systems need to play well together. If a customer is served a video ad, that ad server will need to be able to talk to the company's CRM platform, which will need to signal to the mobile app to generate a push notification. The web, mobile apps, Internet of Things devices, call centers—all of these platforms (some internal, some operated by third-party vendors) will be integrated and work together, successfully routing customer interactions from one platform to another, every node connected and continuously talking to the other nodes.

Imagine that you've just had a fender bender. You call your insurance company, and an automated agent pings your mobile app, initiating a video recording that you can use to document the damage to your vehicle. The app then notifies the automated agent and the call is transferred to a human agent who can help assess the situation. An email server emails you with follow-up information, and then a push notification reminds you to fill out a claim form if you haven't already. These notifications, prompts, and conversations will feel so natural, so seamless and fluid, that you won't even realize you're living a longtime dream of science-fiction writers. At first, you'll be pleasantly surprised by how effortless it is, but experiences like this will quickly become business as usual.

## The Great Convergence

Because all of these touchpoints across a customer's journey will be gathered, the traditional roles of marketing, sales, and support (in other words, presale, sale, and post-sale) will begin to merge into one integrated function. The distinction between these three departments will evaporate to the point where they're sharing management or even budgets. This will happen organically at first because they'll be talking together so often. But the shift will need to be reinforced organizationally, as well. Companies that aren't able to make this shift are going to struggle to keep up with competitors in the coming years.

Let's take it a step further. We are already living in a world in which rideshare companies are offering their drivers banking services, coworking spaces are trying to sell their clients health-care solutions, and social networks are minting their own digital currencies. Companies are doing this because they understand that their customers are not just interested in individual products and services, but in ecosystems of experiences. This convergence of channels and platforms will enable companies to expand into new business sectors in order to provide their customers with the best experiences and the best service ecosystems.

## Conversational AI Becomes More Human

Real conversations have twists and turns. They don't always follow a logical flow. They can refer to an offhand remark made earlier in the conversation with little to no context. They meander off on tangents. These kinds of complex linguistic behaviors come to us so naturally that we don't even think about them when we're talking, but mechanically speaking, casual human speech is extremely complex. Automated assistants tend to excel when conversations are narrowly defined and linear, but this is beginning to change, thanks to advances in natural language understanding.

Today, we typically go online to book a flight. Airline and travel websites typically feature a visual user interface with drop-down menus, budget sliders, calendar widgets, and seemingly countless checkboxes. We're so accustomed to this interface that we know exactly what to do when we see it.

Now, imagine trying to do that with a voice assistant:

> Okay, I want to fly out on the 25th...but it has to be before noon because I need to kennel my German Shepherd. Oh, and I want to fly direct. You know what? Actually, now that I think about it...I should probably leave before 11:00 a.m. to be safe. Hmm, $512 is the best you can do? Would there be a way to fly out the following day for less? I don't want to spend quite that much…and definitely not on Acme Airlines if I can avoid it...

This conversation is verbose and imprecise. You can imagine sparks and smoke emerging from the poor chatbot that tried to field this series of queries. Today's automated assistant frameworks have narrow sets of responses that provide simple answers to simple questions. Tomorrow's conversational AI will be able to answer complex questions and carry out multifaceted conversations like this example.

As the technology progresses, we might see AI assistants that can recognize and respond to human cues such as facial and body language, vocal modulation, and other emotional cues.

## Summary

Conversational AI is the engine driving these trends forward. This technology will allow companies to manage all of their customer interactions efficiently—and, even more important, ensure that customers are receiving the seamless, high-touch experience they crave. This shift from the traditional call center to an end-to-end conversational AI experience is already underway. Not every company is going to make it in this new paradigm. Companies that fail to place customer experience first will see their conversational AI tools break and wither on the vine. The ones that most accurately envision how their customers will want to interact with their bots will see their conversational AI tools flourish, allowing them to capture more data and build bigger, more complex ecosystems of customer experiences. Along the way, they'll help usher in a new world of exhilarating possibilities.

## About the Authors

**Vivian Lee** is director of development, IBM Watson, focused on Watson Assistant, IBM's enterprise AI virtual assistant technology. Her diverse team, which includes researchers, data scientists, and engineers, brings AI innovation to businesses around the world. Vivian has led teams across various functions at IBM including engineering, quality assurance, customer support, infrastructure, and user experience, delivering software to market both in cloud and on-premises.

**Brian Loveys** is a program director for IBM Watson, serving as the offering management lead for IBM's conversational and speech offerings. He graduated with a business degree from Carleton University (Ottawa, Canada) with majors in finance and computer science and is also Pragmatic Marketing–certified. Over the past 10 years, he has been focused in both artificial intelligence and business analytics to gain a deep understanding of how essential these are to the success of any organization.

**Aameek Singh** is vice president, product and engineering, IBM Watson. He leads a team focused on bringing IBM Watson to businesses around the world, with a particular focus on conversational AI, like Watson Assistant, and AI search, such as Watson Discovery. Aameek previously worked in IBM Research, with experience spanning optimizing cloud systems, writing filesystems, and designing Voice-over-IP applications. He received his PhD in computer science from Georgia Tech and a bachelor's degree from IIT Bombay in India. He is a coauthor on nearly 50 international publications and a coinventor on 40 patents. One of his coolest accomplishments is having an Erdos number of 3.

**Robert Yates** is a distinguished engineer at IBM, focusing on IBM Watson Assistant, IBM's virtual assistant technology. Rob has spent the past 7 years working on Watson, primarily focused on conversational AI. As a lead architect, he oversees the engineering approaches for AI. Prior to working with Watson, Rob worked on collaboration software and has deep expertise in the intersection of AI and user interaction.