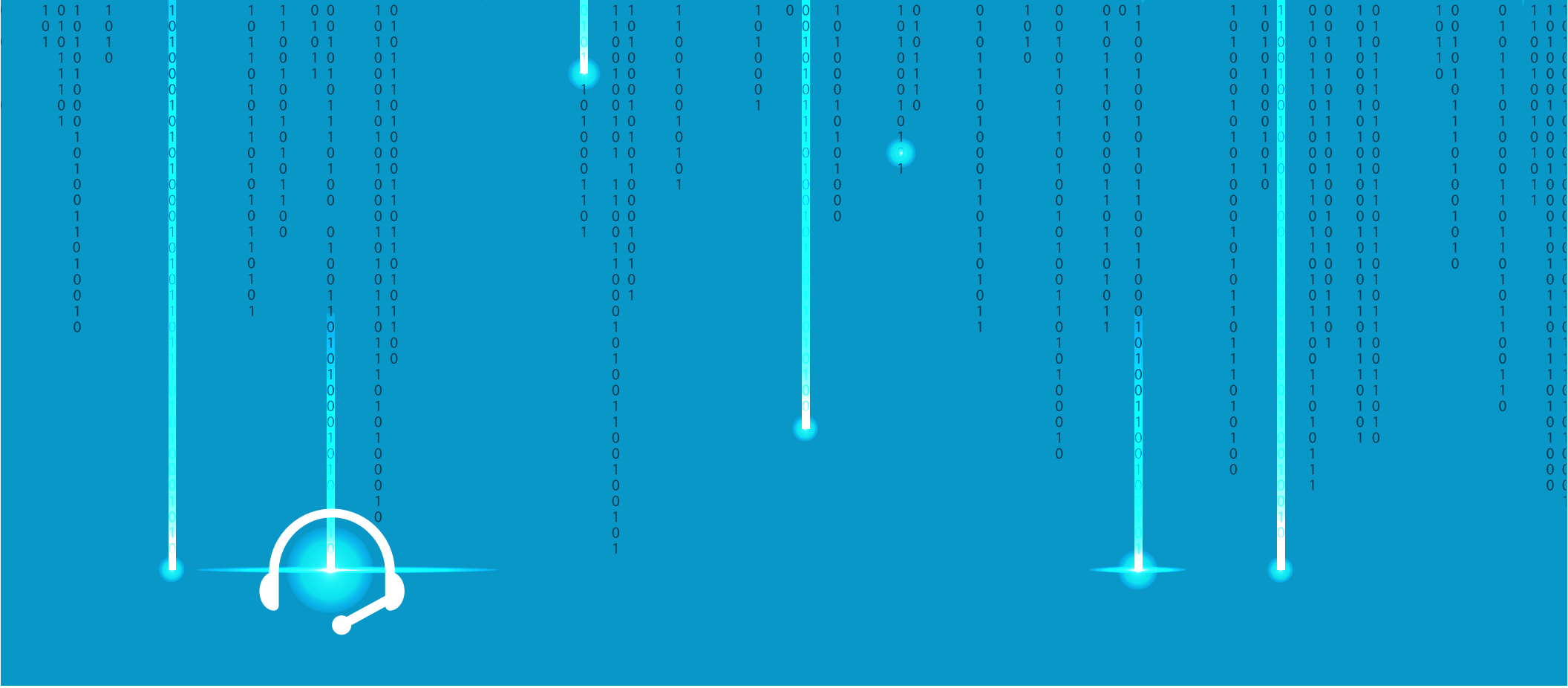

A Practical Guide to AI in the Contact Center

Five9™

Introduction

Are you interested in how artificial intelligence (AI) might impact your contact center?

The hype cycle for AI is nearing its peak. But before you rush to deploy an AI tool, let's separate fact from fiction. What are the practical benefits of AI today? What kind of challenges arise from automation? What are the underlying technologies at play?

In this e-book, we will answer these questions and more. We will examine AI from a pragmatic lens and offer suggestions to minimize costs and maximize returns.

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EXAMPLES OF AI PLATFORMS:

- Microsoft Azure Machine Learning
- Google Cloud Machine Learning Engine
- Amazon Lex
- Infosys Mana
- WiPro Holmes
- Rainbird
- Ayasdi
- Vital A.I.
- Meya
- MindMeld

What is AI?

People tend to generalize their discussions of AI with all the underlying technologies. The artificial intelligence definition is open to interpretation. After all, there are several levels of "intelligent." For the purpose of business, we typically consider technologies that simulate or supplant human action as "AI."

The ambiguity of AI makes it a difficult concept to invest in. The idea of advanced technology deposing human effort has overt appeal. However, without a directive, AI is wasted intelligence.

FIVE9 TIP:

If you want to use AI successfully, ask yourself, "What problem am I trying to solve?"

Do you want a chatbot that can take and place orders in lieu of call center representatives? Do you want a program that analyzes customer data and serves personalized marketing materials? Do you want an IVR that can understand natural language and route customers to appropriate agents?

Out of the box, many AI platforms are tabula rasa (blank slates). They have the capacity for deep analytics, machine learning and automated function, but require initial instruction. It's not all plug-and-play function.

If you have a clear understanding of the problem you are trying to solve, AI may benefit your company. AI is not a cure-all and applying it broadly could backfire. Just like training a new employee, AI has a learning curve. It is only as good as it's inputs and parameters. With a fixed goal, AI can create efficient and actionable results. Run-amuck it could sabotage preexisting processes.

Today, many people are simply looking for autonomous administration. They want to remove all of the grunt work from their office so they can shift focus to more strategic and profitable endeavors. This is possible through a number of technologies – not all classified as overt AI.

Let's look at some of the underlying technology and potential benefits:

Natural Language Processing (NLP)

Understanding language is a huge part of the AI equation. Language is complex and variable. Computers become more powerful and user friendly as they ingest language formulas and convert words to command functions. Whether through audible inputs or chat, the more accurate the NLP, the better the AI can interpret inputs and match appropriate responses.

Voice Recognition

When a command starts as voice, AI must turn inflections and tones into text script. AI then interprets that text script and delivers a response. AI models that use voice recognition rely on trigger phrases and words for their understanding.

When you ask Alexa or Siri what the weather is like, you are engaging voice recognition and an NLP system. Alexa or Siri has AI that can decipher language and derive command functions from syntax and general semantics. Applied to the contact center, this type of digital signal processing (DSP) helps create advanced IVRs, voice transcriptions and some forms of advanced case management.

Machine Learning

Machine learning is a foundational component of AI. The concept of machine learning is to have a base set of protocols that kick off a particular action. Then, have those protocols learn additional rules from responses to ascribed actions. We tend to think of machine learning as the scary doomsday element of AI – robots taking on more autonomous action than originally programmed. But actually, companies today are applying machine learning with narrow parameters, only allowing AI to learn specific tasks without broad variability.

For example, we may have an AI system look at an individual's shopping behaviors to determine which advertisement to serve up next. The choice is A, B or C. The AI looks at all of the historical interactions of the individual customer and customers of a similar profile to serve up a choice most likely to convert. The AI cannot allocate a choice D; it is intelligent within its parameters.

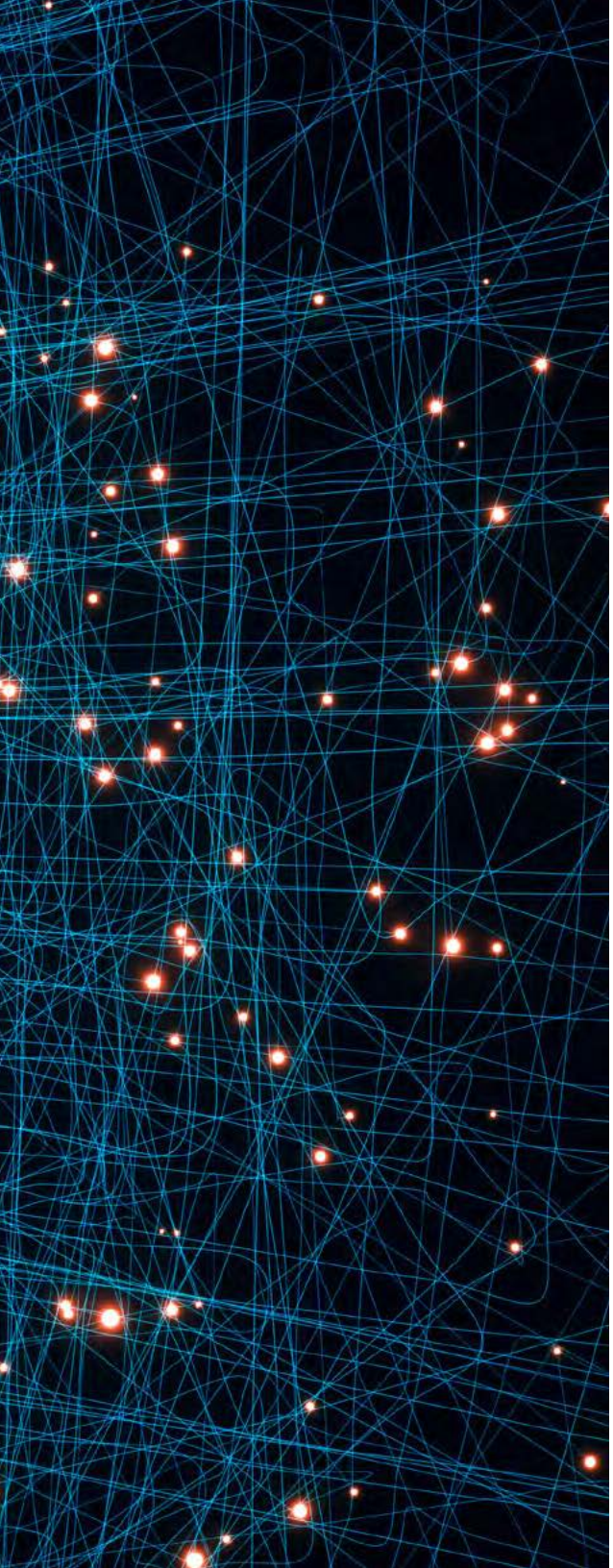
Chatbots

Chatbots are an increasingly popular use case for an NLP and machine learning combination. You may have seen news of Facebook chat sessions led by fully automated service chatbots, but the idea of autonomous communication is nothing new. Similar to voice recognition, chatbots follow key words and phrases to assume an appropriate response. Often companies limit chatbot responses to a list of potential commands. If a query does not meet answer criterion, the chatbot may push the chat to a live agent. Chatbots today are mostly used as FAQs or as an additional form of call deflection.

Chatbots may also serve as a routing tool, first used to decipher a customer's need and then pushing that context to a live agent.

Cloud

Cloud creates synergy. Its main function is to relieve the strain of on premises IT infrastructure and shift resources to a more centralized system. Cloud allows companies to appropriate processing and data storage power at scale. Companies can add more computer power to serve advanced program functions, and scale down if they need to conserve their IT spend. It's a much more economical model than buying a bunch of computers that may or may not accommodate needs. Cloud is the reason many companies can deploy AI today. Rather than pay for their own super computer, companies can lease AI through the cloud network. That, or they can build their own AI that scales according to demand rather than constantly monopolizing computational bandwidth.



An Abbreviated History of AI

It is important to understand several underlying technologies that converged into what we know as modern AI. Some of these technologies share an origin and several exist in a similar timeline. These technologies are components of AI – sometimes referenced as AI – but do not exclusively define AI.

The cornerstone of AI arguably dates back to the 1950, when Alan Turing published "Computing Machinery and Intelligence," which proposed criterion for intelligence later called the Turing Test. In his test, Turing challenged that true artificial intelligence could only exist if a computer could consistently fool a human into believing it is also human.

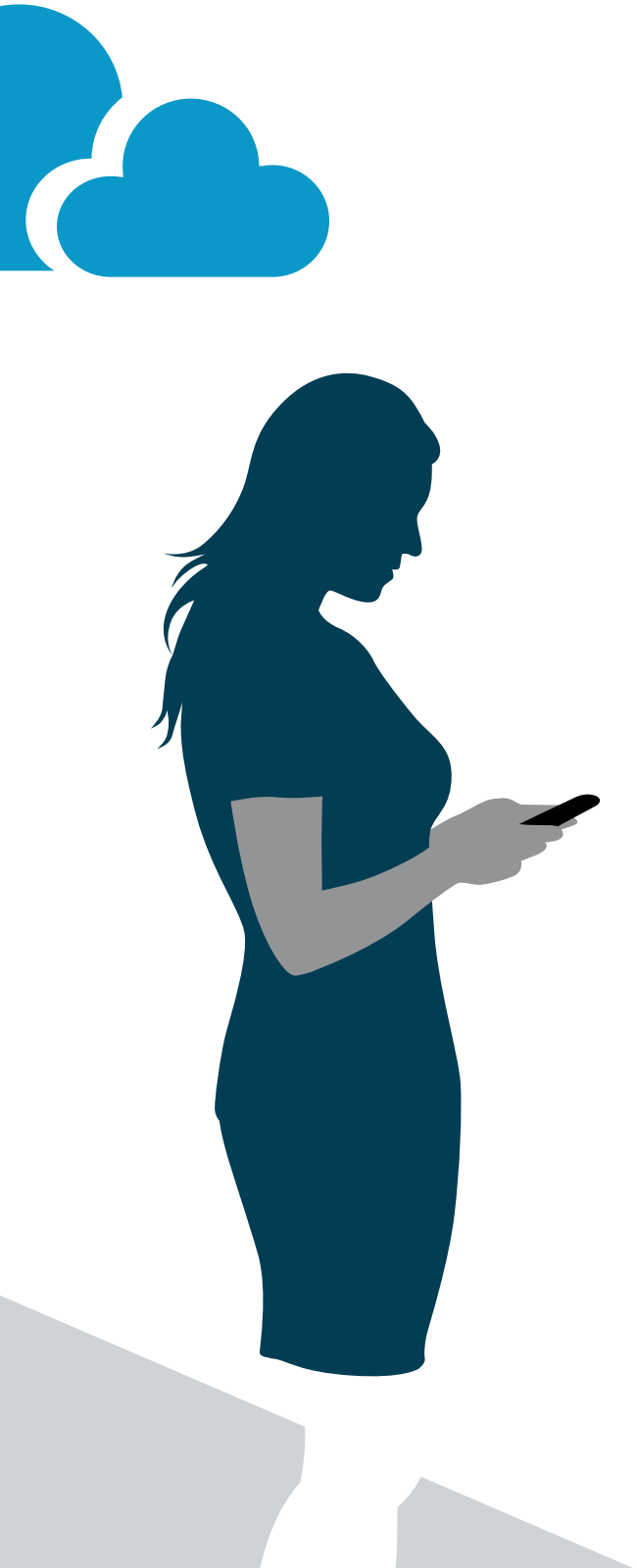
In 1957, on the heels of Turing, Frank Rosenblatt showcased Perceptron, an algorithm for supervised learning in computers, a foundational brain for potential AI. This was the basis of machine learning.

Over the years, countless inventors and innovators refined computers to process more and more information. Generation after generation layered on new intelligence and programs running complex algorithms, improving the "brain" of computers.

Eventually, companies were able to produce computers that could problem solve with astounding speed. Computers applied mathematical equations to seemingly non-mathematical scenarios and made calculated, logical decisions that rivaled or surpassed those of humans.

In 1997, IBM showed how powerful machine learning could be when its supercomputer Deep Blue beat the world champion at chess. Then, 14 years later, its descendant IBM Watson defeated all its human competitors on Jeopardy.

The leap from science fiction to actual science appeared complete.



In the early 2000s, computer manufacturers had managed to significantly reduce the size of computer hardware. However, companies running thousands of computers – requiring significant computational power – still required rooms of dedicated servers to facilitate the massive number of employee users operating on the network.

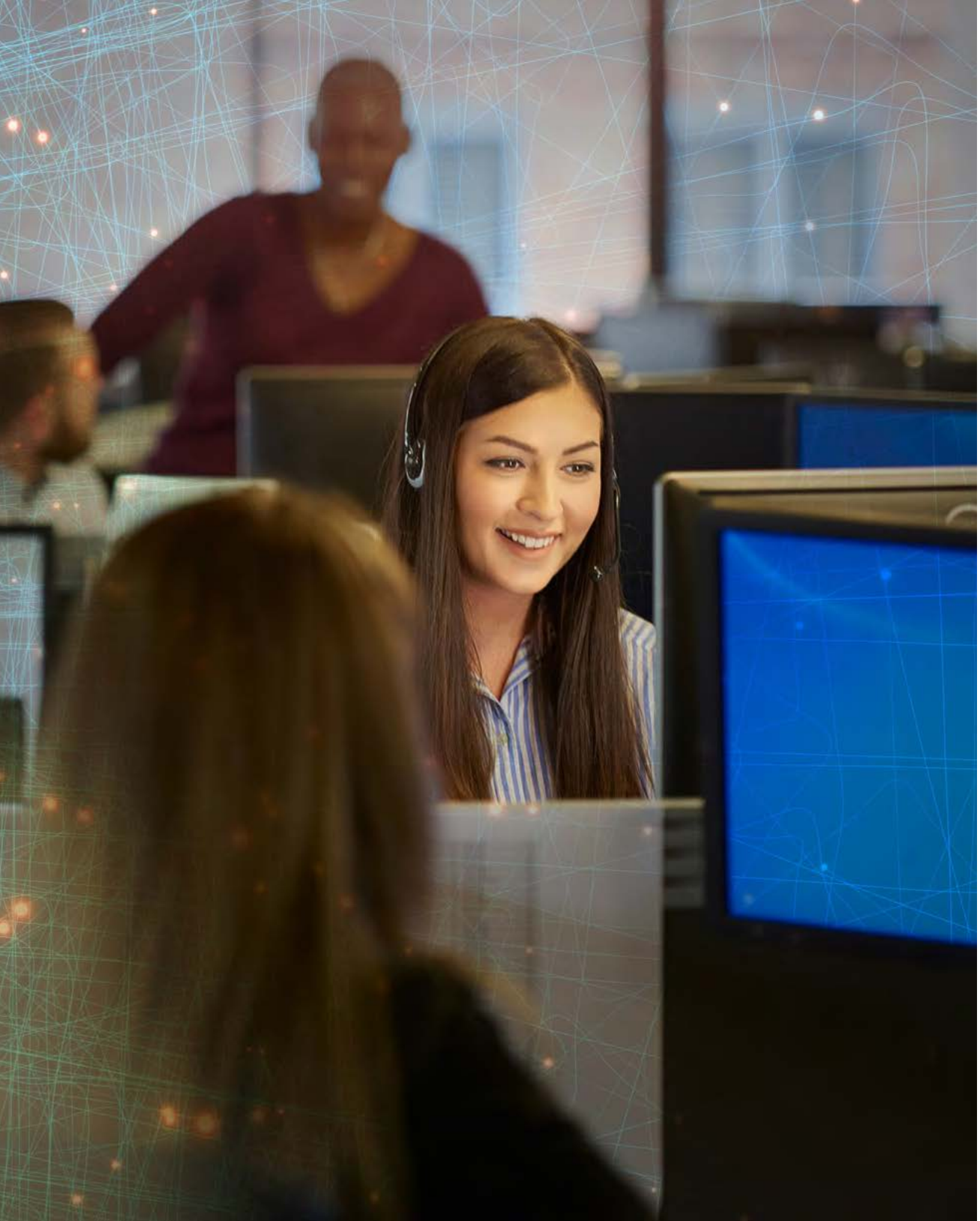
Companies needed places they could store files, processing power for applications and ample network bandwidth to accommodate day-long use. Server rooms required maintenance, constant security, proper provisioning of power and regular updates to remain modern and accommodating for new software.

Computers were a resource, but also a burden. And employees couldn't take their powerful work tools home. They needed private desktops to accommodate their needs at-home.

In 1999, Salesforce pioneered the concept of delivering enterprise applications over the web. It was this initial use case that mainstream interest regarding cloud delivery. If companies could outsource their servers, and harness the power of scalable processing, they could greatly improve their infrastructure.

In 2002, Amazon Web Services (AWS) announced a full suite of cloud-based services including storage, computation and advanced intelligence. Then, in 2006, AWS expanded the service to the commercial web with its Elastic Compute Cloud (EC2). This solution helped small companies and individuals rent data centers to run their own computer applications.

The AWS concept sparked an explosion of interest in cloud technology and competing cloud companies spun up data centers all over the globe. The dynamic nature of cloud meant that, regardless of an individual's hardware/computer, customers could access limitless computational power and data storage of multiple servers for a monthly fee. For businesses, this meant they could run complex applications without having to purchase, warehouse, and maintain bulky hardware on premises.

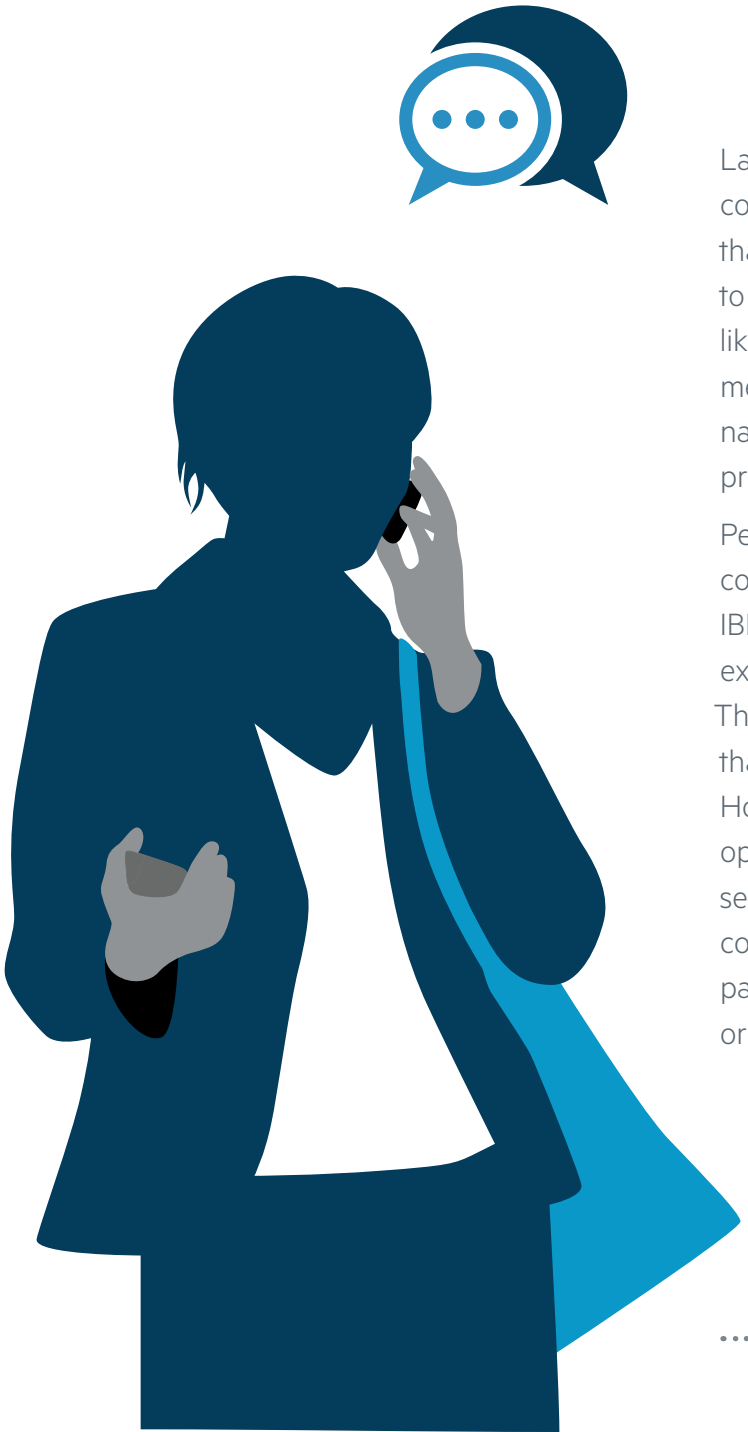


Around 2006, Google, Microsoft, Apple and others started to offer browser-based enterprise applications though web stores. Cloud architecture became the obvious model for business. It was easy to scale, easy to maintain and more cost effective than traditional on premises servers.

In 2014, IBM announced that they would allow researchers to access their AI, Watson, as a cloud service. It was the first time a super computer was made available broadly to the public.

Salesforce followed in 2016 with its AI platform Einstein.

Now, AI companies are helping others harness the power of interconnected cloud servers to build native AI systems. Machine learning is available as a platform and a service. AI is economical.



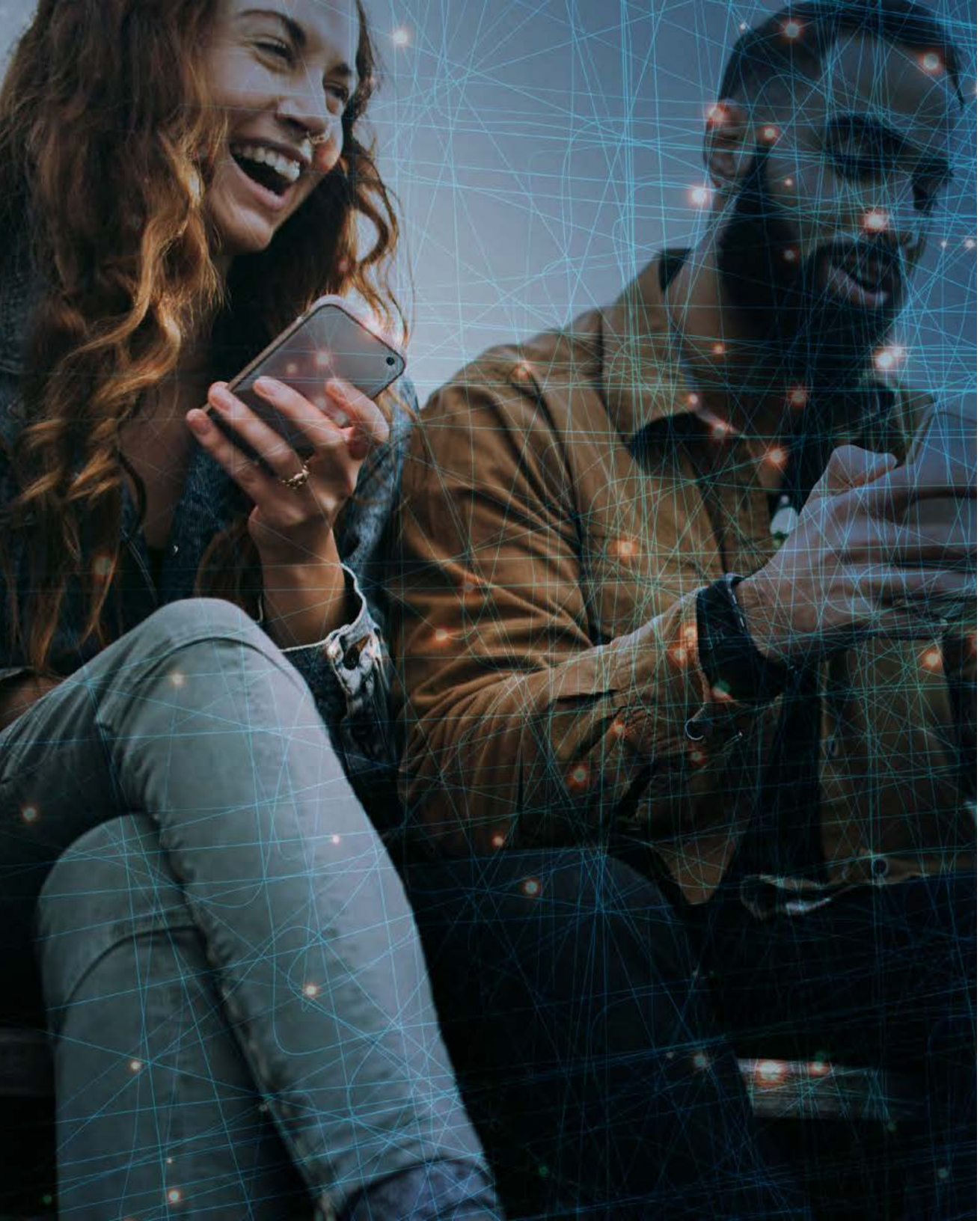
Language is a funny thing. It varies from country to country and maintains different rules that aren't always intuitive. If you've ever tried to learn a new language as an adult, you've likely encountered some confusion interpreting meaning and deciphering tense. That is why natural language processing for computers has proven a monumental task.

People have tried to build translators with computers since their inception. In 1954, IBM and Georgetown University collectively experimented with machine translation. The experimental system translated more than 60 Russian sentences into English. However, the experiment leaned on six operational rules and researchers carefully selected sentences that would minimize complications. The machine was more of a parrot than a true AI. It did not recognize syntax or organically arrive to accurate conclusions.

Throughout the 1960s, researchers continued to toy with translation capabilities and developed word recognition with restricted vocabularies. And in 1970, William A. Woods introduced augmented transition network (ATN). Using this technology, researchers were able structured real-world information into computer-understandable data. This was closely followed by the first generation of chatterbots. One of the most notable, a program written by Kenneth Colby named PARRY.

Still, continuing through the 1980s, program rules leaned on handwritten rules that limited responses to basic structure. However, in the early 1990s machine learning breakthroughs and simultaneous improvements in linguistics theory led to better language processing and modeling.

Refinement of theory and machine learning has continued through the 21st century, getting better each year. Today, computers are able to model language with surprising accuracy. People have applied NLP systems to improve chatbots and voice recognition and create more advanced commands.



Back in the early 2000s, Colloquis, previously known as ActiveBuddy and Conversagent, created and popularized the AIM chatbot SmarterChild. The conversation-based interactive agent would query internet knowledge and serve back quick responses – think predecessor to Siri but for chat. SmarterChild was revolutionary for its time and could instantly answer questions ranging from "What was the score of last night's SF Giants game?" to "What time is it in Beijing?"

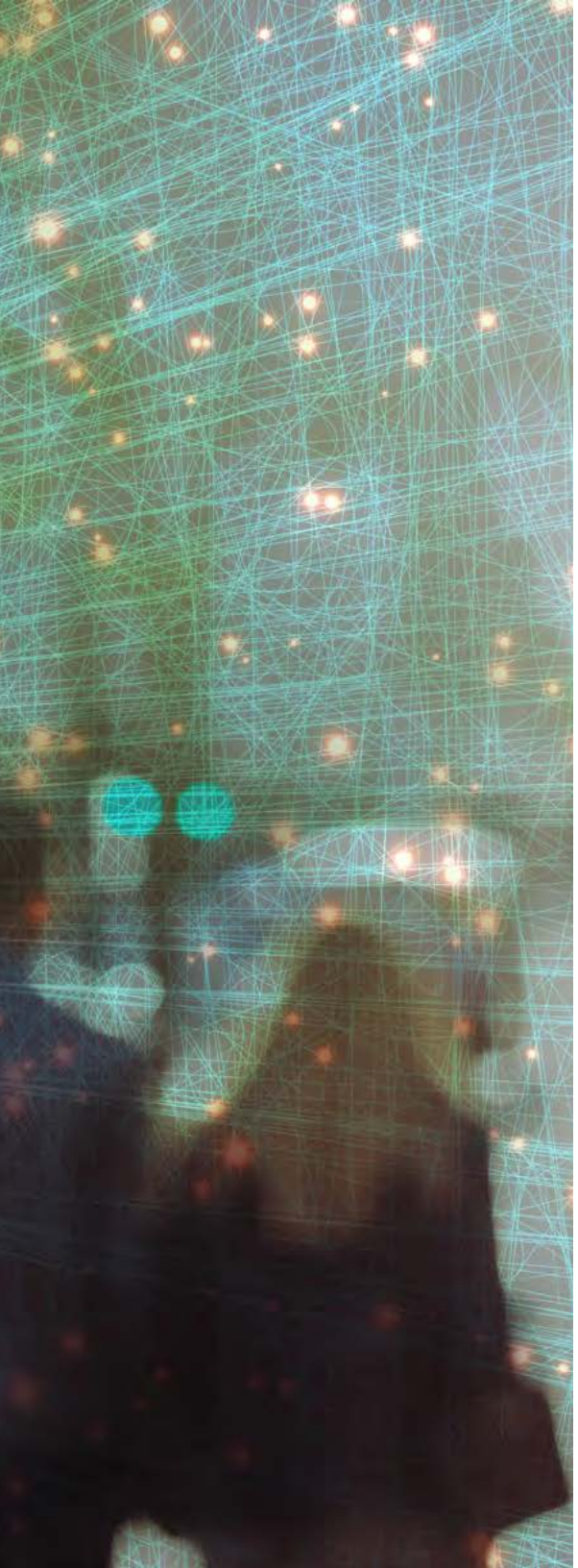
In 2007, Microsoft acquired Colloquis hoping to monetize the novel chat engine, arguably before it was ready. Unfortunately, Microsoft snagged the chatbot company on the heels of the dotcom bubble, where investments were haphazardly managed, and just before the 2008 market crash. It was a formula for failure.

SmarterChild and subsequent spinoff Microsoft Technologies collapsed under the weight of a failing market and misguided priorities. Retail companies and other enterprises simply weren't in the market for half-baked technology to supplant sales and customer service agents.

The technology worked for a quick FAQ. But when the system was equipped with machine learning to expand its go-to-market application, it was unable to filter derogatory and offensive language (ex. Santa Bot and Tay).

Facebook revived the chatbot idea in 2016 when, at the Facebook F8 Developer Conference, Mark Zuckerberg ordered flowers straight from the Messenger application. Strong partnerships and integrations helped Facebook market a more practical chatbot use case. Facebook opened its platform to the developer community and provided tools for chatbot creation.

On the backend, Facebook worked with e-commerce engines like Shopify to give customers the power to browse, and even buy products directly through Messenger. This complimented other projects such as Google Maps integrations and Facebook ad targeting to complete an all-in-one social retail platform. Retailers could invest in Facebook to serve-up targeted ads, reduce friction by streamlining sales through Messenger, and improve customer satisfaction by building in autonomous Q&A chat and package tracking. Facebook bot creators restricted the chatbot function through protocols, providing a more targeted function without potential for rogue derogatory slurs.



Almost in-step with chatbots, voice recognition made inroads converting speech to text and associating text with commands. By 2001, computers were able to recognize about 80 percent of voice commands and served use cases for basic speech activated functions like contact center IVRs.

In 2010, smartphones pushed voice recognition further into the mainstream. Google added personalized recognition to their Android phones and enabled users to query the internet through audio commands. Apple followed closely, debuting Siri as the iPhone 4S personal assistant.

Both systems used in-cloud processing to broaden the scope of their capabilities. With information processed elsewhere, smartphones became computational marvels, small enough to fit in hand with intelligent function to rival desktops.

Voice recognition bridged over into the chatbots of personalized hand-held devices and further expanded the scope of human-technology engagement. Today, Alexa (Amazon), Google Home, Siri (Apple) and Cortana (Microsoft), are centerpiece personal assistants to many homes.

In 2017, Amazon opened Alexis components to the public with Amazon Lex. Companies can now use this service to build conversational interfaces into any application using voice and text. The industry is fast pushing to make the combination of deep learning, automatic speech recognition (ASR) and natural language understanding (NLU) an easy-access platform – something developers can build upon. By opening the underlying technology, companies can create customer facing products with highly engaging user experiences and lifelike conversational interactions.

Today, if you ask someone for an example of AI, they are likely to mention one of the technologies previously outlined in this e-book. Smartphones, chatbots, cloud computation, machine learning, NLP, personal assistants – all these technologies flow perfectly into each other. They created a union of customer convenience. Each year, these underlying technologies improve. Machine learning makes chatbots smarter. Voice recognition becomes more accurate, able to decipher more variable language. In summary, computers can do more.

Our interpretation of "AI" might change tomorrow. That's ok. For the benefit of your business, AI is simply understanding that computers can shoulder more work, more efficiently. If you want a more advanced and automated company with lower costs and higher value, simply ask what products might exist to help. Don't assume that automation does not exist, or is not practical for your company. Log your problems and research solutions.

What is AI's role in the contact center?

Now that you have a basic understanding of the history and different elements of AI, we can look at how those components of AI can work in the contact center.

It is important to reiterate that the "AI" companies currently employ in their contact centers is not true artificial intelligence—typically just a collection of AI components. Moving forward, think of AI more practically as an advanced tool that alleviates functions we'd typically assign to a human.

Tactical Vs. Strategic

A company that can automate tactical business can focus resources to be strategic. This is the underlying philosophy of AI in the contact center. Today, contact center agents still have many monotonous and tactical assignments.

List of Tactical Work

- Filing customer information
- Answering FAQs
- Prioritizing follow-ups
- Routing and forwarding contacts
- Creating lead lists (Sales)
- Tracking customer satisfaction
- Confirming customer identity
- Identifying customer preferences

When you look at the amount of time and resources agents spend on tactical assignments, it is clear that strategic customer engagement is only a sliver of their day-to-day. If you want your agents to serve, sell and market better, it is important to try and alleviate their tactical workload.

Capital One recently launched its own chatbot, Eno, to help manage customers' money by texting in a conversational way. Customers can text Eno things like "What's my balance?" or "How much credit do I have?" and it will provide information instantly. It also facilitates credit card payments with texts like, "Eno, pay my bill."

Many of the AI platforms listed at the beginning of this e-book are useful starting places if you want to build a similar chatbot.

It's helpful to consider AI in the contact center as serving one of the following five functions:

Communication Deflection

Some companies choose to use AI upfront as a personified FAQ. They may do this in an IVR or chatbot form.

Say a customer needs to check their account balance. This isn't really a difficult task. Modern AI in chatbot or intelligent call routing form should be able to recognize the user through a log-in, IP address or phone number. Then, it can identify the "account balance" field in the CRM and serve it to the customer. Why have an agent waste time answering this call and querying a database? An AI system can do it all in a fraction of a second online or over the phone.

FIVE9 TIP:

If you have many customer inquiries that require minimal agent effort, consider deflection tools to eliminate long customer queues. Simple self-service tools that handle the most common inquiries can have an enormous effect on interaction volumes, which of course is why IVRs still play a critical role as a front end to contact centers.

Deloitte works with Five9 to deploy NLP and machine learning tools across verticals. These tools convert agent/customer conversations to text and use key words to trigger case management actions—e.g. update customer data, schedule an event, store recorded information, etc.

Advanced Case Management

What if that customer needs to dispute an error in their account and has a significant issue they need to catalog. Then, perhaps the customer needs help from a real person. In this case, AI would need to juggle more than just a simple question response. Maybe this situation is better suited for an agent. But AI can still help.

Before the AI—in chatbot or other form—pushes the customer to a live agent, it can still do some grunt work. The agent fielding the call or chat will want context to the conversation. The more information they get before the conversation starts, the less time they'll need to waste asking.

During the conversation, the AI can continue to support the agent with suggestions and streamline data entry. This way the agent has less work during and after the call as well.

AI Can Offer Context:

- Who is calling or chatting?
- Why are they calling or chatting?
- What are their preferences?
- What is the likely issue at hand?
- What is the customer sentiment?
- What prescriptions might best serve the situation?

AI works quickly. It can learn agent and customer preferences to improve its delivery. AI in the contact center should recognize and inform where agents waste the most time and then work to remedy processes for faster responses.

FIVE9 TIP:

Consider automation tools like voice assist that can greatly reduce your agents' workload by auto-transcribing conversations, creating real-time action lists and adding information to appropriate fields automatically.

Cogito has developed a real-time conversation-analysis tool based on behavioral science and deep learning. Their AI listens to conversations for both content and tone. They claim it can detect mimicking, change in volume, change in pitch, etc. to gain real-time insight into how customers are feeling and how all company calls are going. It provides real-time suggestions to customer service representatives to improve the call and evaluate performance.

KAYAK, the online travel concierge service, created an AI travel app Lola. When customers register, the app asks a few preference questions. The app works as a personal travel assistant and learns customers' personal tastes over time. Using a chat-based interface, customers can book plane tickets, hotel rooms, rental cars and more. The app assigns customers a human agent and provides a conversational SMS interface. The AI helps the agent make relevant recommendations and reduce shopping time.

Customer Journey Improvement

We love big data. The more information we have on customers the more we can accurately identify their preferences and anticipate their needs.

The problem is that big data is often bigger than we can handle alone; it's more than a human can reasonably sort through and draw conclusions from.

Mountains and mountains of data sound great in theory. But who is going to comb through all that data and translate it into something beneficial for your business?

Some AI tools today exist strictly for the extraction and interpretation of data. Whereas one person would need some millennia to collect and evaluate all customer data, a computer can compound information and look for correlations in seconds.

This is particularly useful when companies use AI to look for behavior patterns and trends that improve sales, service and market functions.

Customer journey is increasingly important for businesses to understand. To remain competitive, sales and service professionals need understand customer obstacles.

FIVE9 TIP:

Consider AI tools that track customers preferences. Look for deep learning and analytic tools that not only recognize patterns, but can also automate sales and service approaches to better improve satisfaction and conversion.

Afiniti uses big data algorithms to analyze information and identify patterns of successful and unsuccessful customer/agent interactions. According to their website, "Afiniti enables the real-time, optimized pairing of individual contact center agents with individual customers in large enterprises."

Resource Provisioning

You have finite resources; this includes money, time and manpower. Luckily, AI can help optimize your resources so that you are exerting less and performing better as a company.

Think about how your company routes calls, chats, emails and other customer communications:

- Voice Quality
- Agent Skill
- Agent Cost
- Best Match for Your Customer
- Distance to Agent
- Voice Quality
- Lowest Cost Routing

Many companies run a default routing system that just prompts the next-up agent to help a customer. But is this the best way to optimize your business?

In some cases, you might lose significant money and time in the routing process of customer communication. Customers looking for an expert or answers to a specific question can easily become frustrated when re-routed multiple times. However, it is near impossible to manually sort callers based on their perceived needs.

In theory, AI tools like IBM Watson, applied to contact center routing structures, could be a great way to evaluate multiple routing rules and make snap judgements to optimize resources. AI systems could simultaneously look at previous customer engagements, channel selection and web navigation and determine a best routing path to save both customer and agent time.

FIVE9 TIP:

Optimize your connection with customers. Make sure your customers get to the right agent as quickly as possible. Reduce friction between customer contact and resolution. Look for tools that can maintain quality uptime and minimize static. Then, use AI to improve interactions.

RankMiner is another contact center tool that can help agents and managers analyze calls, predict business outcomes and prescribe optimal actions. RankMiner has both a Customer Insight and Agent Insight product. The Agent Insight product can evaluate 100 percent of customer calls. It uses voice analytics to determine often intangible insights like agent confidence, engagement sentiment and listening skills.

Quality Assurance Management

How well do your agents handle each interaction?

Hindsight is important in the contact center as a way to help the business grow and identify areas that need improvement. There are numerous ways to measure the success of an interaction, but how do we automate the adoption of feedback to better future agent interactions?

AI is useful in its machine learning form to detect which practices work and are profitable and which systems fail to bring desired results. You may use AI to evaluate how often agents stick to scripts or deviate in discussions. Or you might find it useful to A, B test different tactics. AI can work to check agents work against your desired results and deliver suggestions to improve customer satisfaction.

FIVE9 TIP:

Consider AI tools that help you manage agents and determine successful practices.

Potential AI Pitfalls

AI is not a cure-all. And it is dangerous to approach AI as a miracle cure for any business problem. It is amazing what technology tools can accomplish today, but if you haven't nailed down the basics, an advanced AI won't save you.

Some problems we often see to complete automation without training wheels. Like most tools, if not calibrated properly AI fails.

Here are some things to look out for:

Too many teachers

The history of chatbots came with a great lesson on why you don't let a machine learn without limits. Tay, a Microsoft chatbot without training wheels, started spewing vulgar terms it learned from the dark corners of the internet.

Not everyone is a good teacher. And a machine can't intuitively learn right from wrong. Even internally, if your team is teaching bad practices, your AI system might just parrot destructive behavior.

No concrete objective

When you open your AI to everything and anything, it'll often accomplish nothing. AI needs to have a directive. It needs you to point it to a particular problem. If you deploy an AI tool with no measurable understanding of the problem you are trying to fix, you might just be throwing money down the drain.

You measure your employee's performance. Think of AI as an additional employee. However, AI always follows orders. It's important to reflect on AI performance as the result of inputs. If your AI isn't delivering, don't fire it. Rethink how you are using and training it.

Setting the bar too high

Incremental change is the most important change you can hope for in the contact center. If you think AI will change your outcomes overnight, you are sadly mistaken. Again, like hiring a new employee you need to account for necessary ramp time and training. You might see results within a few months, but it is doubtful you'll have a full scope of the AI success until it is a well-established part of your practice.

How do you prepare for an AI future?

Honestly, it is more important that you prepare for digital transformation than an impending AI revolution. The majority of contact centers are significantly behind on some basic technologies – omnichannel, analytics, agent interface, etc. If you are part of the lucky/smart minority of companies that have established strong contact center tech, great! Then, maybe AI is a logical progression.

Nail down your core technologies. Get a CRM that has strong integration partners and can facilitate customized sales and service processes. Deploy a contact center solution that meets the needs of your agents and customers. Get a complete view of your customer interactions and collect substantial data. Maintain your e-commerce and related communication platforms. Retain quality connections, uptime, clarity of voice and system processes.

That is the best way to prepare for an AI future.

About Five9

Five9 is the leading provider of cloud contact center solutions, bringing the power of the cloud to more than 2,000 customers worldwide and facilitating more than three billion customer interactions annually.

Five9's solution helps contact centers create exceptional customer experiences, increases productivity and boost revenue.

For more information visit **www.five9.com** or call **1-800-553-8159**

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