inference

Buyers Guide to Intelligent Virtual Agents and Chatbots

Liz Osborn | February 2019

25%

of customer service and support operations will integrate Virtual Agent (VA) technology (called Virtual Customer Assistants by Gartner) across engagement channels by 2020, up from less than 2% in 2017.

70%

The research also showed that firms that implement a VA achieve up to a 70% reduction in contact inquiries, while seeing an improvement in customer satisfaction.

Gartner

Introduction to Virtual Agents and Chatbots

Major advancements in Artificial Intelligence (AI), Speech Recognition and Natural Language Processing have given organizations that need to automate self-service a giant leap forward. For the first time ever, companies of all sizes can now use Virtual Agents to reduce costs and improve the customer experience. Unfortunately, these advancements have also led to some confusion in the market. The terminology surrounding Virtual Agents can be confusing and it's often challenging for an organization to understand exactly what can be accomplished today. Buyers also need a framework to help them decide which functionality should be implemented in order to meet their most pressing business needs.

This buyers guide is designed to walk you through this confusing landscape. It will help you understand what a Virtual Agent is and how it can improve your business today. Read on to get the scoop on what your options are for VA's and to get a solid framework for making a purchase decision.

a. A Rose by Any Other Name: Terminology and Definitions

1. **Virtual Agents (VA) —** also known as Virtual Customer Assistants (VCA)- A software program that can emulate human customer service or sales personnel, often based on AI platforms. Virtual Agents use either a speech (spoken) or chat (written) interface to "talk" to customers. Virtual Agents automate repetitive tasks and transactions like allowing a customer to check balances, pay bills, authorize a credit card or schedule an appointment. This allows your most valuable asset- your people- to focus on solving more complicated problems, saving you money while improving your customer's experience.

2. **Conversational AI: Computers that talk —** Conversational AI systems are computers or programs that interact with people through a natural language conversation, just as you would have with a live person. Conversational AI draws from a group of technologies, that include Speech Recognition, Text-To-Speech, Voice Biometrics, Natural Language Processing (NLP) and Machine Learning (ML). Conversational AI systems make it easier for your customers to get support through your automated system because the complexity of the interaction can be dramatically simplified. We've all encountered IVR systems that lead you through a series of long and frustrating interactions where at each stage the caller has to play a game of "20 questions" by answering yes, no type questions. Conversational AI increases the percentage of inquiries that can be automated, helps you extend the hours of service and enables you to offer service to a larger audience. Conversations can be complex; it's not just about the words you use, so a good Conversational AI system requires an understanding of context, tone, sentiment and previous conversations. Virtual Agents use Conversational AI to have a natural, free flowing conversation with a customer.

3. **Chatbots —** Chatbots typically have a text-based interface and can be either inbound or outbound. Chatbots can be utilized on a company's website, on SMS or messaging platforms like Facebook and What's App, or in mobile apps. Simple chatbots use structured dialogs that can't handle a request outside of the specific script, they are based on key words and focused on simple tasks. More intelligent chatbots are integrated to enterprise backend systems like CRM and ERP. They are able to handle natural language conversations, deal with multiple topics, can switch topics in one interaction, and are based on Conversational AI.

Automatic Speech Recognition — (ASR) ASRs recognize and translate human speech into text. Some speech recognition systems can be trained to recognize a particular users voice and are called "speaker dependent". Others do not require training and are called "speaker independent". ASR solutions are provided by vendors like Nuance, LumenVox, Google Cloud and IBM Watson.

Natural Language Processing (NLP) — is the ability for computers to understand and interpret human conversations, both written and spoken. The objective is to make computers understand the many nuances of human conversations, including tone, sentiment and language.

Machine Learning (ML) — Machine learning is often described as training because the algorithm is trained to match the correct answer (the output) to every question offered (the input). ML is used to teach computers to do a wide variety of intelligent things like driving cars, winning games and answering questions.

It's also being used by companies like Google and Amazon to improve Conversational AI. They employ powerful neural network models to improve the accuracy of their speech recognition algorithms. The ML systems learn to translate speech into text more accurately (and improve over time) because massive amounts of data, collected from consumers speaking to their personal assistant devices are fed into the neural net to "train" and improve the recognition engine.

4. **Interactive Voice Response (IVR) —** An IVR is an automated telephony-based computer system that gathers information about callers, provides self-service and/or routes calls to the right live agent. Traditionally IVRs have interacted with the callers through touch tone interfaces- (aka Dual Tone Multi-Frequency or DTMF). Today, most IVRs still use DTMF interfaces (i.e. Push 1 for marketing, 2 for sales}, while some have been updated with very basic speech interfaces ("press or say 1"). Service departments that still use basic IVR are now trying to understand how they can embrace the latest advancements in Conversational AI to improve the quality of service they offer to callers through their automated systems.

5. **Virtual Personal Assistants (i.e. Siri, Alexa, Google Home, Cortana) —** Personal assistants can help you do things like play music, schedule meetings and check the weather. Consumers who have become accustomed to speaking to their Google Home or Amazon Alexa, now expect the same type of interaction when they phone a business for service or support. The proliferation of these devices is being supported by a transition of the underlying Conversational AI technologies into the cloud. At the same time speech recognition, text-to-speech and NLP is improving as the cloud-based services are trained by the data generated through millions of consumer conversations. Personal Assistants also appear to be highly intelligent because they can make use of a lot of contextual data. For example, Siri can access the data in your phone to help it schedule meetings and place calls. In the future, your Virtual Personal Assistant may actually interact with a company's Virtual Agent to fulfill your request to take care of an issue, for example, to pay a bill or order a product.

b. The Rise of Virtual Agents-Why Now?

Virtual Agents (VA) often work closely with your human employees, offloading repetitive tasks. The technology has been around for over a decade but is just now exploding. What is driving their current popularity?

1. **Rising Customer Expectations —** Today's customers demand personalized answers fast, on demand, and delivered in a way that is most convenient to them. If you don't meet their high expectations, they may turn to your competition who delivers a better experience.

2. **Demand for Self-Service —** More and more, customers now prefer self-service; in fact, Gartner predicts by 2020, customers will manage 85% of their relationship with the enterprise without interacting with a human. While this may be an ambitious forecast, it highlights an important trend will continue as the millennial generation buying power grows.

3. **Technology Improvements and Growing Comfort with Conversational AI —** Consumers are now conversing daily with AI based assistants, such as Alexa, Siri, Cortana and Google Home. As they get comfortable with this, they are expecting to use similar technology in other areas. At the same time, AI technology and speech recognition capability are also rapidly improving, leading to wider adoption of the Virtual Agent technologies.

$28,000
cost per year

$4,800
cost per year

| Human Agents | Virtual Agents |
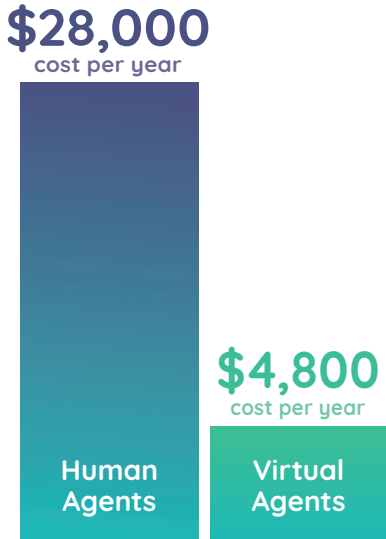
Cost savings — per year

$23,200

4. **Massive Focus on Digital Transformation —** Startup companies are using new technology centric business strategies to disrupt legacy markets. The taxi business is facing competition from Uber and Lift, brick and mortar retailers are under pressure from Amazon. Even banking is facing competition from new digital first lenders. Almost every segment of the market is facing new competition and are racing to develop new digital business models to defend their businesses. Improving automated self-service is a key pillar of many organizations' strategy to improve the customer experience and build a more direct relationship with their customers.

Chatbots & Speech-Enabled IVR Unite

Two types of self-service technologies are merging to become what we now call Intelligent Virtual Agents. The first started by offering self-service to customers over the phone in the form of IVR, eventually adding on basic speech recognition. The second, now called chatbots-later emerged to provide self-service through chat or SMS. Both types have become more intelligent over time as they embrace technologies like NLP and ML to improve quality and scope of service. We have now reached the point where an automated service solution can be designed once to support both voice and text-based channels of service further reducing deployment costs.

What Types of Benefits Do Virtual Agents Provide?

Companies of all sizes are finding they can benefit from turning over a wide variety of tasks to Virtual Agents. Here are some of the benefits:

1. **Provide a Better Customer Experience —** Unlike a human employee, if a Virtual Agent is built properly, it can respond consistently across multiple communications channels on a 24/7 basis. Whether it's on your website, taking a phone call, in a mobile app or on a messaging platform, a Virtual Agent can answer customer questions and resolve issues quickly and easily, on whatever channel and device the customer prefers. New channels can be added quickly as needed.

2. **Reduce Costs & Improve Employee Productivity —** A good VA will offload tiresome repetitive tasks and automate workflows that currently take up valuable human resources. A VA can easily scale to service more customers without adding more people-and do it around the clock. It's never rude or in a bad mood, and it won't ask for days off!

3. **Improve Compliance and Reduce Risk —** A variety of industries must contend with strict compliance to standards; violations can lead to hundreds of thousands or even millions of dollars in fines. Penalties for violating HIPAA regulations can run from $500-$5000 per incidence. Telephone Consumer Protection Act (TCPA) penalties can run from $500-$1500 per call, text or fax, and total violations can run in the millions if companies aren't careful. Virtual Agents can be structured to ensure that you comply with these standards. For example, PCI-Compliant Virtual Agents can collect sensitive credit card information without the assistance of a live agent, ensuring that credit card data remains private. Similarly, HIPAA compliant Virtual Agents can collect sensitive patient record information.

What Can a Virtual Agent Actually Do for Your Business?

Every organization has different needs when architecting an automated self-service or virtual agent strategy. Companies of all sizes- even ones that don't have traditional contact centers- can benefit from Intelligent Virtual Agents.

This section will give you an overview of some typical types of tasks a Virtual Agent can perform to help reduce costs, increase customer satisfaction and improve productivity for your specific type of business.

A. **Smaller Organizations —** If you have a small or local business, you may not have a contact center in the traditional sense, but you do have employees whose job entails varying degrees of customer contact. Your volume of customer interactions may not be as high as a company who requires a contact center; however, because the technology is so cost effective, there are a number of ways that a Virtual Agent can help you reduce costs and improve your customer's experience. You can:

- Enable callers to request a call back instead of waiting on hold.
- Offer automated appointment scheduling and reminders.
- Offer to send directions via SMS.
- Replace frustrating touchtone menus for incoming calls with natural conversations.
- Offer automated order lookups.
- Collect payments for services-and be PCI compliant.
- Offer self-service outside of standard business hours.

B. **Mid-Size and Large Enterprises —** Your organization has a traditional contact center for customer service and/or sales. Your contact center may range in size from small (1-100), mid-size (100-500 agents) to large (500+ agents) to global (multiple locations around the world, typically 1K+ agents). Virtual Agents can play a key role in cost reduction, compliance and digital transformation for your organization. Virtual Agents can:

- Augment contact center agents with easy to use, conversational self-service across multiple channels.
- Reduce customer service costs by offloading easy repetitive tasks currently handled by agents.
- Provide VIP service to your most important customers by routing them immediately to someone who can help them.
- Extend service business hours.
- Handle growing volumes of interactions, support peak seasonal transactions, new services and products without adding employees.
- Ensure Compliance across industries- including automated solutions for PCI payments, HIPPA and TCPA.
- Offer more complex, transactional self-service applications like making hotel reservations, booking travel or applying for a loan.

> Virtual Agents can play a key role in cost reduction, compliance and digital transformation for your organization.

Virtual Agent Tasks by Industry

Virtual Agents can be taught to do specific tasks just like their human counterparts. Here are some examples of Virtual Agent capabilities for a few selected industries that companies of all sizes have found to be very valuable.

When you choose the right Virtual Agent platform, these tasks will be pre-built, out of the box, and can be easily customized to suit your organization's unique business needs. With the right solution, Virtual Agents can also easily and quickly be custom built for any industry.

When you choose the right Virtual Agent platform, these tasks will be pre-built, out of the box, and can be easily customized to suit your organization's unique business needs.

All Organizations

- Enable callers to request a call back when an agent is available, instead of waiting on hold.
- Easily reset passwords automatically.
- Automate collections & take PCI compliant payments. Ensure TCPA compliance.
- Offer easy automated customer surveys

Retail

- Offer a convenient store locator
- Route the call to a local store or department through a centralized number, using customers own words (Natural Language routing)
- Allow customers to do an account lookup and check order status
- Provide VIP service to your most important customers by routing them immediately to someone who can help them.
- Allow customers to manage their subscriptions.

Hospitality, Food & Beverage

- Offer an easy to use hotel/store/restaurant locator.
- Provide VIP service to your most important customers by routing them immediately to someone who can help them.

Business Services

- Offer a store/branch/office locator.
- Automated appointment reminders with easy re-schedule options.
- Offer an appointment scheduler.
- Allow customers to easily lookup their accounts and check order status.
- Enable emergency notifications.

Healthcare

- Automated appointment reminders with easy re-schedule options.
- Offer an appointment scheduler.
- Enable an automated subscription or prescription reminder.

How Intelligent is Your Virtual Agent?

Levels of Artificial Intelligence (AI)

Unless you've been living in a cave the last few years, you've been hearing a lot about Artificial Intelligence, or AI. If you are to believe various predictions, movies and tv shows, AI will soon be everywhere, it will take our jobs, and it will either save us or destroy us. What, exactly is AI? As it turns out, there is no one agreed upon definition, but the bottom-line goal of AI is to program computers to make them solve problems, reason and learn as humans do. There are 3 standardized "levels" of AI:

- **Artificial Narrow Intelligence (ANI) —** Also known as "weak AI", this is AI that is focused on a very narrow, specific task, such as a Virtual Agent answering a customer service question, ordering a product, or an AI program playing chess. All Virtual Agents fit in this category, as do personal assistants like Siri and Alexa. This is the level of AI that humanity has achieved so far. Narrow AI works in a very limited scope, for example, you couldn't ask a Virtual Agent designed to answer customer support questions to order pizza.

- **Artificial General Intelligence (AGI) —** human level or "strong" AI- Can reason, learn and perform tasks like a human. When presented with an unfamiliar task (like ordering pizza), an AGI system would be able to figure out a solution without human intervention. AI has yet to achieve a fully functional AGI program.

- **Artificial Super Intelligence (ASI) —** moving beyond human intelligence, this is currently the stuff of science fiction.

What makes a Virtual Agent Intelligent?

Not all Virtual Agents are created equal; some are very simple, scripted VA's, with very little intelligence built in. Sometimes that's all you need. But to create a VA that will grow with your business, you need to make sure you chose a VA with room to grow smarter over time as your business needs grow and change. You need an Intelligent Virtual Agent, or IVA. What makes an IVA intelligent?

Virtual Agents have skills — For example, they can understand human speech in over 100 languages and can respond using text-to-speech (TTS) that is almost indistinguishable from a human agent.

Virtual Agents can automate things — They can perform all kinds of tasks to care for customers. They can authenticate callers with voice biometrics, make appointments, reset passwords, look up orders, survey customers and answer all kinds of questions — over the phone, web or SMS.
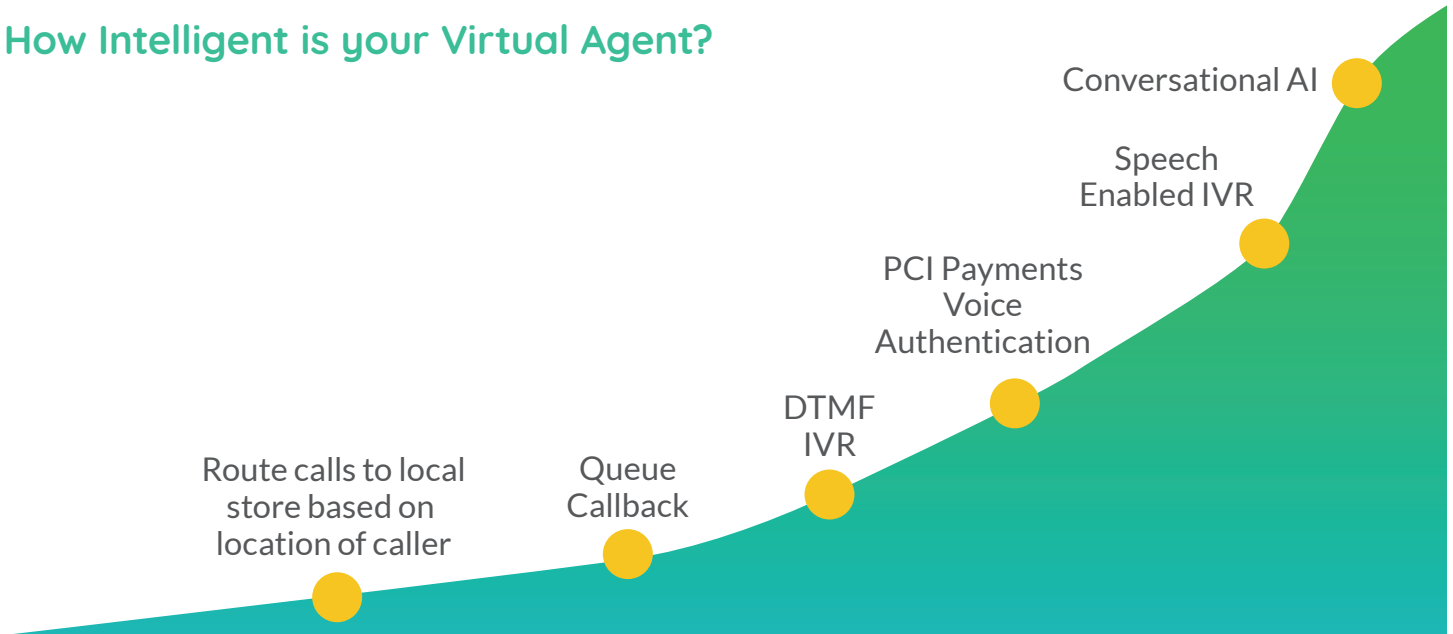
Virtual Agents can have different types of conversations — Whether over the phone or through a text-based interaction, Virtual Agents can use multiple approaches to have a conversation with a customer from very basic to very sophisticated.

- Dual Tone Multifrequency (DTMF) — "Press 1 for sales, 2 for service."

- Directed Dialog — "Would you like to purchase, please say yes or no."

- Mixed Interaction — "I'd like to fly from Austin to Boston, next Wednesday at 5Pm"

- Natural Language Processing (NLP) — Ability to have a natural language, free flowing conversation via phone.

> The bottom-line goal of AI is to program computers to make them solve problems, reason and learn as humans do.

Virtual Agents can also learn — They can use machine learning to understand the various ways your customers ask for things. Just as every person is different, they will ask for the same thing in different ways. For example, if the Virtual Agent is programmed to understand "I need to fix my car", over time it can learn the many different ways this might be asked-i.e., "my car needs to get fixed", "my car is broken down", or "my car needs help".

How Intelligent is your Virtual Agent?

Conversational AI

Speech
Enabled IVR

PCI Payments
Voice
Authentication

DTMF
IVR

Route calls to local
store based on
location of caller

Queue
Callback

This framework is a tool to help you assess where your business should fall on the spectrum of Virtual Agent capabilities- and where you would eventually like to go, depending on your business drivers. By matching up your business needs with the relevant level of VA intelligence needed to achieve your goals, you will have a solid framework to make a purchase decision on what level of VA technologies to implement. Remember that Virtual Agents are highly customizable allowing you to combine almost any set of skills with a set of tasks that can be automated. This model is intended to provide you with some examples to get you started.

1. **Business Need —** Determine what you are currently looking to achieve with a Virtual Agent; what's your business need now? What are your business goals in the future? Is it different than today? There are a broad range of agent skills & capabilities that fall under the Intelligent Virtual Agent umbrella; some companies will want to implement the entire spectrum over time, but for others, the entire set of capabilities won't ever be necessary or desirable.

2. **Virtual Agent Capabilities —** Match those business needs up with the Virtual Agent skills to help you determine the most relevant out of the box Virtual Agent technologies for your company to consider.

Repeat this process if your future business goals for your Virtual Agent evolve and grow over time, for example, if you are looking to cut costs today with a Virtual Agent, but anticipate growing the VA to delight your customers in the future.

Intelligent Virtual Agent Buying Framework

	Cost / Convenience	Compliance	Customer Experience	Innovation
BUSINESS NEED	Is your primary goal to reduce costs while providing your customers with a convenient service? Virtual agents can route calls and automate repetitive tasks currently handled by your human employees. Your business can get a lot of value with a relatively modest investment.	Is your business goal to avoid fines and maintain compliance with a particular set of industry standards like PCI-DSS of HIPPA?	Are you trying to create competitive differentiation with an amazing customer experience? Making the user experience more conversational will help. You may also want to consider supporting customers through their preferred channel of service. The exact point that you transition to a "customer experience" strategy from a cost, convenience & compliance strategy will vary based on size, industry, regulations.	Are you looking to disrupt your market, to lead the market in cutting edge customer care? Would you like to use Virtual Agents to support a digital transformation strategy? Is your business an early adopter of new technologies? Then your business driver is innovation, and you will be looking to implement some of the most sophisticated technologies.
VA CAPABILITY	• Queue Callback: Caller can keep place in queue and request a call back when an agent is available. • Intelligent Network (IN) Routing: IVR routes voice calls to local store, office, restaurant, or department based on where caller is calling from. • Auto page capabilities. VIP routing to enable sending important customers to the right person immediately. • Basic Touch Tone (DTMF) IVR functionality. Route calls, offer menus, lookup tables, and respond with recorded audio. • Chatbot- ability to text or chat on website with an automated chatbot	• Ability for the Virtual Agent to take PCI compliant payments • Ability for a live agent to transfer a call to a PCI or HIPPA compliant Virtual Agent to process payment.	• Speech Enabled IVR- Ability to use speech for simple directed dialogs • Text-to-Speech technology to allow dynamic responses using a synthesized voice • An Integrated dialer to make outbound calls or send SMS • Voice Authentication — ability to recognize customers voices and authenticate just on that.	• Realtime 'open speech recognition' in virtually any language • Natural Language Processing – enables the caller to be greeted with an open-ended prompt like "How can I help you" • Use of technologies like SSML to optimize text-to-speech • Sentiment Analysis so that you can react to the emotional response of callers

What to Look for in Your Intelligent Virtual Agent Platform: Decision Criteria Checklist

An Intelligent Virtual Agent (IVA) is built on an IVA platform; but not all IVA platforms are the same. The first few generations of AI-based Virtual Agent platforms are still around, delivering a "black box" that require many, many hours of customized development, professional services and data scientist resources in order to tweak and maintain complex AI models and conversational dialog flows. This has resulted in extended deployment times and inflated costs for companies who choose the wrong vendor.

The new generation of purpose built, SaaS based Intelligent Virtual Agents offers a much better, more cost effective and easier way to deploy Virtual Agents. Here's what to look for when comparing Intelligent Virtual Agent Solutions:

- **Purpose Built —** for customer care or sales
- **Omnichannel —** speech (voice) and chat (written text) interfaces, across a variety of customer touchpoints and channels, such as phone, websites, and messaging platforms.
- **Build Once, Deploy Anywhere —** Ability to build the Virtual Agent once, then deploy to any channel with minimal changes.
- **Speech Recognition and Text-to-Speech —** with easy access to 100's of languages.
- **Advanced Natural Language Processing —** with integration to services like Google Dialogflow and IBM Watson.
- **Technology Neutral —** your Virtual Agent solution should bring together access to all of the relevant vendors' market leading AI and Speech tools with an easy to use visual front end.
- **Future Proofed Technology Access —** does the solution give you timely access to new innovations in Speech, Conversational AI & Natural Language as they're adopted in the market?
- **No Developers or Data Scientists Required —** Does the solution provide drag and drop, easy to use visual tools to create new tasks for your Virtual Agent? Can you build a Virtual Agent without coding? Even non-techies should be able to build new Virtual Agent tasks in minutes after minimal training.
- **Pre-Built, Re-usable Task Library —** so you don't start from scratch
- **Deploy and Build New Tasks in Minutes —** not weeks, months- or years! If you want to add new tasks such as appointment confirmations, bill payments, or account lookups, you should be able to build them quickly.
- **Easy Integration to Enterprise Systems —** ERP, billing, CRM, etc. Can you quickly lookup a customers' information and personalize their response as needed?
- **Enterprise Ready —** is the solution scalable to hundreds of thousands or millions of interactions, does it provide security and authentication capabilities, is it reliable?

Learn More

If you'd like to learn more about how Virtual Agents can help you improve customer take a look at some these resources from Inference.

- Get a personal demo.
- Take an online Udemy course.
- Sign up for a free trial account.

What Are Your Deployment Options?

Now that you've decided to "hire" a Virtual Agent, what are your choices? Just like buying a car, there are a lot of different options to consider. Believe it or not, some people actually prefer to buy a car kit or find the parts and build the car themselves. With Virtual Agents, similar to buying a car, you could buy the various technologies from a variety of vendors and build it yourself. You can also buy it "pre-built" with everything you need to deploy a Virtual Agent quickly.

Do it yourself

a. **On Premise/Perpetual License Virtual Agent —** Large capital expenditure (CAPEX) required. Must buy hardware, software, hire developers, data scientists & system administrators. Requires yearly software & hardware maintenance & upgrades. Larger systems with high volumes of calls and chats require equipment room/ Network Ops Center (NOC) with cooling, high end MPLS networks, multiple carriers, and redundancy to ensure high availability of services. Seasonal peaks require planning for more voice ports and data bandwidth to avoid system overloads. Pros: extensive functionality and customization, ability to handle large volumes, enormous flexibility. Cons: Complex, expensive, requires enormous CAPEX expenditures & human resources, constant maintenance and regular upgrades.

b. **Buy from a Cloud or SaaS based IVA vendor —** Can scale volume up or down as needed with a phone call. Service Provider maintains and upgrades the software and hardware required to run the solution. You pay a standard, monthly subscription fee, then typically develop and maintain the specific Virtual Agent program tasks yourself or pay hefty professional service fees to have the vendor do it for you. Pros: ability to quickly scale as needed. Cons: Will still need to "assemble the parts"; either the service provider will need to develop integrate & maintain the Virtual Agent tasks, or you will need to do it in-house.

Managed Service

c. **Buy from your Network or Telecom Provider —** Everything is built, integrated, upgraded, maintained and managed by the solution service provider and/or your carrier/network provider. All you do is turn it on. Pros: Eliminate multiple vendors, add as part of your telephony/network service. Self-service options for moves, adds & changes.

Conclusion

Virtual Agents are rapidly coming of age; picking the right one can save you time, money, and improve your relationship with your customers. The best way to find out more regarding how Intelligent Virtual Agents can benefit your particular business situation is to talk to the experts at Inference Solutions.

Liz has over 25 years of experience in enterprise cloud and software marketing. Liz currently has a marketing consulting practice, where she specializes in assisting B2B software companies to achieve rapid growth. Liz was VP, Product and Solution Marketing at [24]7.ai where she was responsible for all product, vertical and technical marketing. At Five9, Liz was VP, Product Marketing where she was a key contributor to the company's rapid growth and IPO. At Genesys, as Sr. Director, Product Marketing, she helped guide strategic product direction and led core product-marketing efforts. Liz has deep knowledge of the enterprise cloud contact center and customer service and support markets including expertise in Contact Center as a Service (CCaaS), AI, virtual agents, and the customer experience. Liz has also held product and marketing leadership roles at Alcatel-Lucent, Macromedia and Lucent.

Liz Osborn
Contact Center
& Customer
Service Consultant

inference

Sales Enquiries
sales@inferencesolutions.com

Australia
530 Collins Street Level 5
Melbourne, Victoria 3000
Australia
Phone +61 1300 191 431

General Inquiries
info@inferencesolutions.com

Headquarters
2 Embarcadero Center #8156
San Francisco, California 94111
United States of America
Phone +1 855 300 1219