



Virtual Assistant Invasion – Will They Take Over the Contact Center

Advancements in Speech Technologies, Big Data and AI
Unlock Growth Potential for Customer Care

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Executive Summary

This growth insight examines the rapidly emerging area of Virtual Assistants (VA). Employing advancements in technologies such as artificial intelligence (AI), machine learning (ML), Big Data and Analytics (BDA), and natural language processing (NLP), VAs are emerging as viable self-service options across industries.

Modern VAs are supplanting early self-service options, such as speech-enabled IVR, with a plethora of capabilities that speak to the change in consumer adoption and usage of technology. Interactive Voice Response (IVR), Chat, mobile apps and social media channels are all being harnessed with rich self-service interfaces that enable customers to access information and make transactions in ways unheard of a decade ago. VAs offer new ways of service delivery that have particular growth opportunities for customer care organizations. From offloading tedious agent workload to engaging customers with a branded avatar, virtual assistants are showing up as key interaction channels for some of the largest brands in the world.

The field, however, is scattered. Confusion reigns over the terminology to describe these emerging applications, and the capabilities associated with each term. Companies also are unsure of the benefits of deploying them. As such, VAs still remain a niche application that often falls prey to lack of funding compared to other interaction channels or applications.

However, there is no ignoring the fact that in this era of delivering omnichannel customer care that VAs can play a crucial part. Providing rich self-service options that have the potential to get better over time can play a significant part in improving the Customer Experience and creating brand recognition for a business. VAs also can impact companies' bottom line by reducing costs and increasing revenue. They can offload tasks from live agents, reducing the need for live resources. They can proactively contact customers to reduce calls into the contact center while increasing customer engagement. They also can hand off customers to live agents, and work side by side with live agents for additional assistance.

Investigating VAs as part of an omnichannel and digital transformation strategy should be a strategic imperative for any company. This growth insight lays the groundwork for where to look and what to look for in the virtual assistant arena, and provides examples of how VAs are being deployed.

Introduction

Daily a blog, article or press release appears that mentions now commonplace names of Virtual Assistant (VA) products such as Siri, Cortana and Watson. Virtual Assistant, Personal Assistant (PA), and Intelligent Virtual Assistant (IVA) are all terms bandied about with great regularity as answers to automate personal tasks as well as customer service. Relatively new variants entering the discussion are avatars, bots, messaging apps, and robots. New market entrants are emerging so fast it is hard to keep up with them or tell them apart. Why is there so much attention on these applications? Why now, and why should you pay attention to it if you are a customer care executive?

The market for speech-enabled, AI-driven assistants is broad and scattered. In one corner we have consumer grade personal assistants found in mobile phones. In another, applications

such as those powered by IBM Watson that harness machine learning, AI and BDA to solve everything from knotty research questions in healthcare to customer support issues. There is every variation of virtual help, but muddled definitions and murky public awareness of the differences.

The emergence of new solutions and resulting market chatter can be attributed to two dynamics. First, is the maturation of a numerous technologies that combined can provide an answer to a number of challenges within the contact center market. Speech technologies, Machine Learning, Big Data and Analytics, and Artificial Intelligence are some of the core technologies that make up the backbone of these applications. Breakthroughs in development in these and other technologies provide half the answer to 'Why Now'? But the second half is the changes occurring within the ranks of consumers, and their attitudes towards technology usage.

This market insight explores the technology and market drivers behind the recent outpouring of virtual assistant announcements. It includes:

- Background on the development of IVAs
- Market landscape and definitions for technology-enabled assistants in the customer care arena.
- A showcase of solution providers
- Growth opportunities and uses cases
- An assessment of what companies should do when investigating the usage of VAs.

Historical Perspective

Advancements in speech technologies, artificial intelligence and related technologies have been going on for decades. While many technological hurdles, such as computer speed and storage or speech recognition accuracy, needed to be addressed in order to bring applications to the mass market, there also needed to be a mind-set change as well. For instance, early on the popular idea around non-human assistants was cast in concrete by Hal, the sentient computer in Stanley Kubrick's and Arthur C. Clarke's 1965 movie, 2001: A Space Odyssey. For decades after its release, consumers held commercial attempts at speech-enabling applications, particularly in customer care, to the standard depicted by a non-human movie character. It was left to research labs in academia and contact center vendors marketing IVR to try and break through the education and acceptance ceiling imposed by that vision of Hal.

Virtual assistants aren't new. Although few probably remember, attempts at creating 'Hal' have been going on since the mid-1990s. These original assistants were in a category called personal telephony, and were developed by companies such as General Magic, Hey Anita!, Webley and Wildfire. Their products consisted of speech-driven, self-service applications that allowed users to access limited amounts of data from popular websites, and automate some office productivity tasks. For example, customers could call and get information on sports scores, stock quotes, and the weather. They could even get horoscopes and soap opera updates, as well as do things such as create calendar entries.

However, those early entrants didn't gain much market traction. Personal Telephony companies that didn't get acquired went out of business. The next steps in the virtual assistant market were further developments in improving speech-driven IVR systems by adding new features

such as natural language, knowledge database access and the beginnings of the use of artificial intelligence.

Key Market Drivers

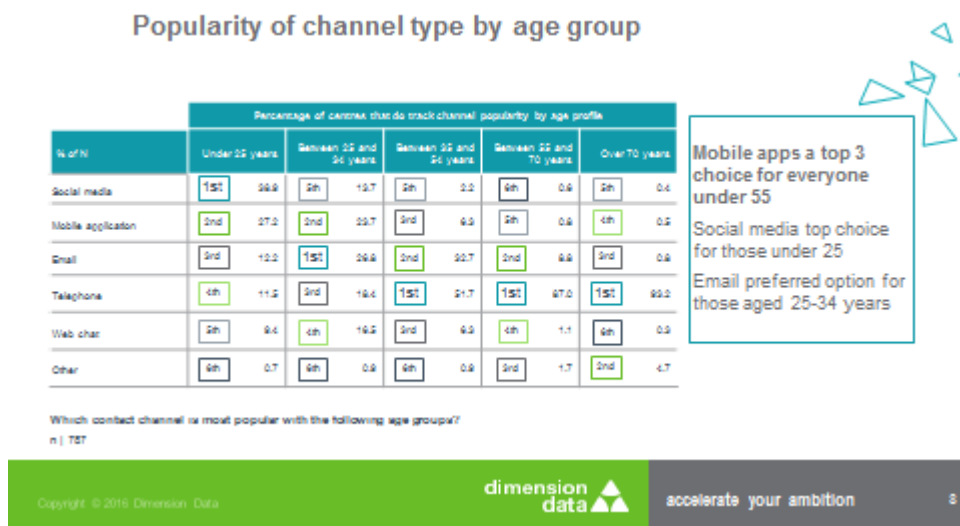
Since then a confluence of technology advancements and market awareness efforts vastly changed the landscape in which we now find ourselves. Enter the world of the virtual assistant, intelligent virtual assistant and intelligent personal assistant. These assistants run the gamut from consumer grade voice-search assistants, to high-end AI and Big Data-driven applications capable of problem solving and replacing agents in customer service environments. But it wasn't just technology that has driven the market to explode. It is also the market dynamics of a changing consumer base.

The Millennial Consumer

A common refrain in business is that you shouldn't deploy technology for technology's sake. Where once very true, this quote has less impact when dealing with post-Boomer consumers. While Gen X started the digital native trend, Gen Y embraced it, and accepted it as part of the millennial culture. Millennials are different consumers than prior generations, and are the best connected generation in history. They are very attached and comfortable with technology and 'their mobile devices', and practically live on them. They do everything from use them for portable entertainment, to buying goods and services, and for staying in touch and networking with others on social networking sites.

An additional attribute of Millennials that bodes well for the interest and adoption of VAs is their passion for self-service. As a group, they prefer to self-help, from researching information to troubleshooting issues before contacting a business. This preference can be seen in Exhibit 1, drawn from Dimension Data's 19th annual Customer Contact Benchmarking report.

Exhibit 1: Popularity of Channel Type by Age Group, Global, 2016



Source: Dimension Data

A further trait of Millennials that has been exploited by developers has been the demand for better, richer human-machine interfaces. This was sparked by the emergence of more intuitive user-interfaces in software applications, entertainment, and in mobile devices, and ignited in particular by the user-interface of Apple's iPhone. Apple broke the mold on usability in mobile devices. Once consumers started seeing the potential for simple, but highly functional interfaces, they demanded more. Indeed, the launch of the iPhone personal assistant, Siri, fuelled by Apple marketing dollars, set up the conditions for mass awareness of the potential for easy to access and use, speech-driven personal assistants. Microsoft's Cortana and others soon followed. With applications such as Siri and Cortana leading the charge, the pump was primed for additional applications to hit the market.

Millennials also are more comfortable with communicating with applications through speech. In fact, in a recent Parks Associates study¹ of 10K consumers, 40% of smartphone owners use the speech recognition capabilities of their devices, with 46% of Millennials responding that they use it. Overall, nearly 72% of consumers said that they were satisfied with their experience with speech, and 38% said very satisfied, showing a growing comfort with speech interfaces.

An equally important factor is Millennials desire for businesses to know them, and for wanting more personalized interaction. When extended to intelligent interfaces, they demand highly customized and personalized applications that can individually identify and interact with them. This passion for mobile apps, self-service, intuitive user interfaces, and personalization has created a powerful driver for the adoption of VAs.

Technology Landscape

Frost & Sullivan's Big Data and Analytics Stratecast group has pinpointed the five foundational components of virtual assistants as:

1. **Machine learning**, also known as deep learning, is a simplified model of actual human neural circuitry that ingests data and solves problems, and has the ability to continuously "learn" and adapt based on evolving inputs and customer needs.
2. **Artificial intelligence** and artificial general intelligence (AI/AGI), builds on machine learning by enabling machines to exhibit intelligent, human-like behavior. We are seeing the breakthrough of market-relevant applications in artificial narrow intelligence (ANI). ANI-based systems display intelligence in limited and well-defined domains, and cannot transfer abilities from one domain to another.
3. **Natural Language Processing**, the ability of a computer to interpret or understand human language, both typed and using voiced speech, and take appropriate action.
4. **Real-time analytics**, which occurs via stream processing of data in primary data storage, or random access memory (RAM), before the data is sent to secondary data storage.
5. **Web services and user profiles**. Web services support interoperable machine-to-machine interaction over the Web; systems develop user profiles by accessing customer demographic and usage basics as well as a variety of contextual, social, and behavioral data points. This enables the system to determine the optimal products and services to offer a user, the best channels to use for selling and servicing actions, and more.

Important advancements within all these categories have occurred simultaneously with the ramping up of customer expectations. For instance, consumer desire for businesses and applications to know who they are and what they want is being fulfilled with more accurate predictive analytics. Advancements in artificial intelligence, machine learning and speech technologies have increased the acceptance by consumers.

And the technology is getting better every day. As an example, Microsoft announced in mid-October that its researchers had pitted Microsoft's NIST 2000 automated system against professional transcriptionists and found for the first time a higher error rate among humans than computers². This kind of accuracy has broad implications for just such a market as VAs.

Meet the Cast in the Virtual Assistant Landscape

Virtual Assistants

Frost & Sullivan is using the term virtual assistant to encompass all speech technology driven assistants used in consumer devices and consumer-facing customer service applications. There are variations in capabilities across these products, but lines are blurred. In the customer service arena, they fall into two broad categories – personal assistants found embedded in consumer electronics such as Siri on the iPhone or those found in home appliances, such as those in Amazon's Echo or Google Home, and those deployed as “virtual agents” specifically for customer support by companies.

In general, virtual assistants use a conversational speech or text interface (or both) to allow customers to interact with the application, do search, and make transactions in an automated fashion, without requiring human interaction. When delivered as a text-based VA, they often appear as an Avatar next to a text box for customer interaction. Increasingly, companies also have used “bot”, “chat bot”, or “chatterbot” to denote these assistants, particularly if they are delivered as text-based assistants accessible on a web site. Recently, companies have been applying the term ‘intelligent’ to the assistant category, as if to imply that there are deeper capabilities involved as opposed to other automated agents. This has significantly muddled having any standard definitions within the VA arena, as virtual assistants and personal assistants can have the backing of Big Data and AI applied, yet be called a “bot”, and some that are called intelligent VAs have limited AI capabilities.

However, overall the hallmark for high-level VAs or IVAs is the ability for the ‘agent’ to ‘remember’ and get better over time with subsequent customer interactions. Where this has been typical of consumer grade Siri-like interactions, it also is being used as a differentiator among customer service grade VA applications. Thus, the “agent” remembers over time and across channels the context and history of the customer interaction, and learns so as to improve on content, context, and personalization in subsequent interactions.

The key is that there is no one guiding definition, and solution providers use all these monikers interchangeably, leaving customers to have to dig to understand individual products capabilities and how they can help their businesses.

Consumer Grade Virtual Assistants

A key driver of VA adoption for customer support is the emergence of consumer-grade VAs. These assistants are found in consumer devices from new home “appliances” to those found in mobile devices. They are gaining broad consumer awareness through mainstream advertising done by the companies that created them, including heavyweights Microsoft, Google, Apple and Amazon.

For deployment methodologies, one of the broadest is Cortana, developed as part of Microsoft’s Conversation-as-a-Platform (CaaP) strategy. Cortana, much like Siri, is found on Windows 10, as well as iOS and Android devices. Cortana utilizes Microsoft’s Bing engine for search, and enables users to do a wide range of things from ordering goods and services, to scheduling and other tasks. Similarly, Amazon has put forth Echo and Google, Google Home. These home appliances feature personal assistants that can do a breadth of things including ordering, streaming music, reading news, sending texts, and controlling the user’s smart home environment.

Chat Bots

As described in Frost & Sullivan’s, “The Rise of Messaging Bots and Virtual Assistants – A new user interaction paradigm” published in May 2016, “a bot can be described as a software agent (application) that interacts with users or other bots. It may include elements of artificial intelligence and interact with users in a variety of ways including on the Internet, through email, and messaging apps (or voice interface). Thus, bots can fulfill a wide range of interactional tasks—from automating conversation, to transactions, and workflows.” In the customer service arena, chat bots are being deployed on web sites for customer service assistance, and sometimes as a variation on speech-driven VAs available via telephone/mobile device. Nuance’s Nina, for example can be deployed both ways, accessing the same information to provide a more seamless Customer Experience.

Recently, the heavyweights in the social media sphere have introduced messaging bots on their platforms for brands to engage more directly with consumers. As an example, using its Messenger Platform, Facebook opened up its Messenger API to developers to allow companies to enhance customer service on social media by embedding interactive customer experiences into Facebook using chatbots. As with other VAs, these allow customers to do myriad things from shopping to making restaurant reservations and other tasks. Similarly, Twitter just announced that it has launched automated welcome messages and replies to its direct messaging function. Brands such as Airbnb and Pizza Hut have already developed their own customer service apps on the Twitter platform.

The most effective chatbots provide help when the customer needs it. So, using customer data, such as CRM data and customer journey data, the bot should pop up when the customer appears to need assistance, or when there might be an opportunity to sell or upsell based on what the customer has been doing on the web site, previous visits to the web site, or activity in other channels.

Robots

A related category that falls into the realm of customer support is robots. Though not typically mentioned in a customer service setting, robots address the “brick and mortar”, physical aspect of customer service. Robots are physical personal assistants that are being deployed in a number of vertical markets, to interact with and even bond with customers. The term “customer” in this sense, can range from a retail customer to a homebound healthcare patient. For example, some are being used as greeters in stores, or to deliver items to hotel guests, provide home healthcare companions, or interact with children in an educational environment. One of the most recent of the companion robots is Kirobi³, released by Toyota to act as a companion. Kirobi uses speech recognition, facial recognition, emotion detection and other technologies to create a human like companion experience for its owners.



Source: Toyota

Robot Process Automation

Finally, there is another category, while not customer facing, that has everything to do with customer service. Robot Process Automation (RPA) uses “virtual” robots to process front and back office processes just like agents. Typically used in the back office, they also can be used side-by-side with a contact center agent with “attended automation,” assisting agents in handling routine desktop tasks. For example, NICE RPA consists of virtual agents – software robots that work in the background to complete tasks without human intervention. They can complete any number of tasks from claims processing to scheduling work orders and delivery. Robots can work on back office or contact center processes. These robots operate on a virtual server and pull tasks from a work queue. Work can be initiated on the agent/worker desktop and completed by the robot or vice versa. In addition, work can be initiated by an Intelligent Virtual Assistant, an agent, or initiated by interactive analytics that trigger a workflow. The robots’ work can be supervised and managed via a control room dashboard. While they can only do one task at a time, they can handle an infinite number of tasks, prioritized, scheduled, or first in, first out. Robots can also be measured against performance metrics.

Why Companies Should Care

The benefits to companies of deploying virtual assistants for customer service are many, and include:

- Offloading of live agents of tedious, repetitive tasks
- Providing 24/7 workers that never get tired, don't quit, and deliver a consistent messaging and branding experience
- Catering to growing desire for high quality self-service
- Providing brand differentiation
- Cementing customer loyalty

VAs that have been deployed using best practices are delivering some very positive results, from increasing customer engagement to reducing costs. They also greatly improve upon limited dialog IVR systems by being able to have a “conversation” with the customer to further understand customer's issues and needs, and speed service delivery.



The following section provides use case examples.

Use Cases

The following is a smattering of virtual assistant use cases.

Exhibit 2: Selected Customer Results Achieved by Deploying Virtual Assistants

Customer: IVA/Chatbot	Situation/Need	Solution Benefits ROI
Swedebank: Nina Web IVA (Nuance – Nina Web)	<ul style="list-style-type: none"> • Swedebank serves 8M people and 600K corporate customers. It wanted to enhance digital self-service, since 60% of its customers bank digitally. • Swedebank expects digital to be the primary channel of choice for its customers by 2018. • Future plans are to add Nina to mobile, along with transactional capabilities. 	<ul style="list-style-type: none"> • 3 months after deployment Nina was handling 30K interactions a month, with a 78% first contact resolution. • Now Nina handles 50K per month, the equivalent of 30 agents. • Nina is equipped to answer 350 questions and growing.
Radisson Edwardian Blu – London: Edward Chatbot (Aspect Software)	<ul style="list-style-type: none"> • Wanted to automate simple requests. • Wanted to increase customer engagement 	<ul style="list-style-type: none"> • 75% of requests sent to Edward deflected from front desk hotel staff • Guests liked Edward so much, sometimes they left him tips.
Helpline – Credit Card Fraud Reduction Robot (NICE) – Robotic Process Automation	<ul style="list-style-type: none"> • Helpline handles 8K monthly fraud alerts, with a five minute response time SLA. • Average handle time was twelve minutes, including eight 	<ul style="list-style-type: none"> • Robot eliminated 8 minutes of wrap up time. • 100% SLA compliance

Customer: IVA/Chatbot	Situation/Need	Solution Benefits ROI
	<p>for wrap up. It wanted to reduce wrap-up time.</p>	<ul style="list-style-type: none"> • Left more time for case management. • Added guided resolution for live agents as a follow-up • Process AHT reduced by 82%
<p>Highmark Insurance True Image Interactive</p> 	<ul style="list-style-type: none"> • Help customers choose the right insurance plan • Reduce costs 	<ul style="list-style-type: none"> • 60% of customers completed process through to pricing of plans. • 30% of people who started the process applied for insurance coverage • 20% of users who began the process asked for information to be mailed to them. • Overall the avatar reduced acquisition costs by 65%
<p>J&B Medical Supplies</p> <p>Smart Action – IVA Customer Video - https://www.youtube.com/watch?v=unUeT04bZs</p>	<ul style="list-style-type: none"> • Due to HIPPA regulations, patient identity needs to be authenticated prior to service, requiring multiple pieces of information • Needed to streamline and automate patient identification/authentication, across a wide demographic 	<ul style="list-style-type: none"> • 96% of patients engaged with the IVA • 70% of callers were fully authenticated • Reduced AHT from 210 seconds to 87 (60% reduction) • Saved estimated \$200K per year

Sources: Clients/Published Articles

Final Thoughts

Will VAs take over the contact center? The answer is no. When done well, VAs can provide a rich channel of customer interaction that in many cases can handle complete and complex customer inquiries. They provide the chance to enhance a brand's Customer Experience. They can provide brand differentiation. They also can speed service delivery and reduce costs.

However, done poorly they can have the opposite effect. When a customer gets stuck, the VA doesn't understand the inquiry, or gives the wrong response, customer satisfaction plummets. The human touch, a phrase used for decades, weighs heavily in the equation when you talk customer service. VAs can offload a lot of tasks. But that last 10-30% of an inquiry that

requires nuance, intuition, judgment, or in some cases, “tribal knowledge” not found in a database or captured in best practices, can make all the difference in customer satisfaction.

In addition, while interest is high, and new solutions are emerging at a rapid rate, adoption still remains low. This is played out in Frost & Sullivan’s most recent Big Data & Analytics Survey, from the Stratecast group. It showed that only 16% of companies have deployed AI; and an equal number have deployed machine learning. However, a full 80% of companies believe AI creates jobs and improves the performance and efficiency of human workers; only 15% believe that AI eliminates jobs. This bodes well for the VA market.

So investigate and deploy with care. Weigh carefully what should be handled by VAs and Bots and what should be handled by a live agent. Look to see if deploying a VA on one channel, suits your needs, or creates a silo without consistency across channels. Weigh the time and costs involved. Some can be costly deployments, while others are being deployed as a software-as-a-service model, with development, ongoing tuning and maintenance included.

While simple VAs are being used to offload tasks, when it comes to more complex inquiries VAs need extensive training in the domains of interest. Companies are advised to get references within the vertical market they are in to see how VAs have successfully handled domain expertise within a market.

Finally, take advantage of free trials and proof of concept. Consider starting small with one app that allows data gathering for expansion, or employ a “Wizard of Oz” approach using live agents in the background to handle more complex inquiries, while gaining understanding of the range of inquiries.

1. Stratecast, 2015 Big Data and Analytics Market Survey: Initial Observations (BDA 3-14, 30 December 2015)
2. Microsoft <https://arxiv.org/pdf/1610.05256v1.pdf>
3. http://newatlas.com/toyota-kirobo-mini-companion-robot-release/45720/?utm_source=Gizmag+Subscribers&utm_campaign=f7aef723c7-UA-2235360-4&utm_medium=email&utm_term=0_65b67362bd-f7aef723c7-91462333

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