Decision Makers' Guide to Enterprise Intelligent Assistants
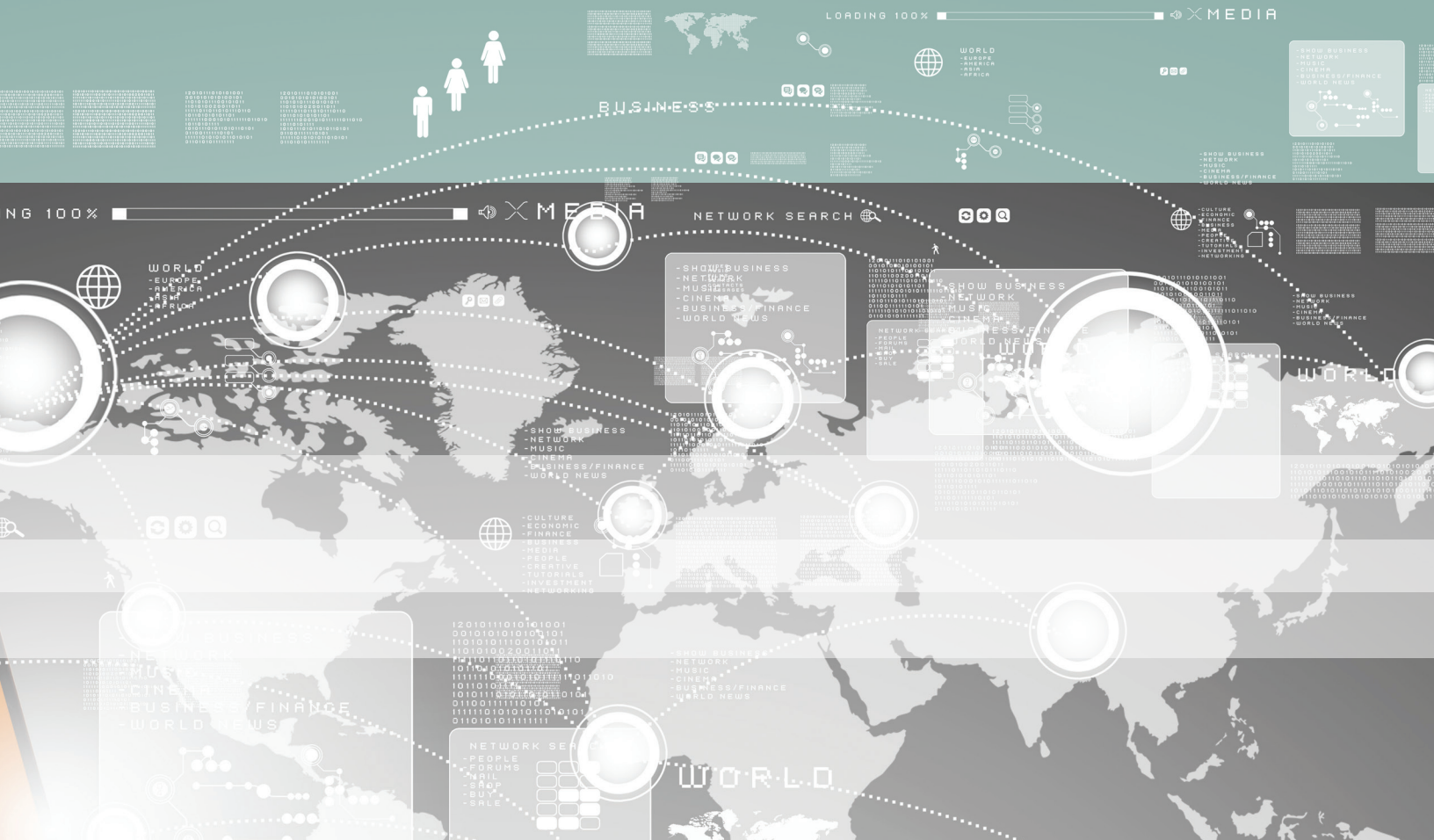
The Brave New World of Bots and Virtual Agents

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Decision Makers' Guide to Enterprise Intelligent Assistants

The Brave New World of Bots and Virtual Agents »

Opus Research presents a comprehensive assessment of the current Intelligent Assistant (IA) and bot solution provider landscape with special focus on 28 vendors offering "enterprise-grade" solutions. Based on data gathered by Opus Research, this group accounts for over 2,700 deployments of intelligent assistants among a customer base approaching 1,200. The rapid entrance of tens of thousands of bot developers and introduction of thousands of new "skills" has brought a new sense of urgency to inspire digital commerce, customer care and marketing professionals. The age of Intelligent Assistance is being thrust upon these executives around the world and across multiple industries — it is no longer a matter of "if" but "when."

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Key Findings and Report Summary

In this report, Opus Research presents a comprehensive assessment of the current Intelligent Assistant (IA) and bot solution provider landscape with special focus on those offering "enterprise-grade" solutions.

The past year has witnessed explosive growth in enterprise spending on licenses, services and platforms. Investment was roughly $750 million in 2015, which was more than double the $350 million originally forecasted by Opus Research in 2013. At this rate, Opus Research foresees explosive growth of the industry poised to blast through $1 billion in 2016, on the way to $4.5 billion globally by 2021.

Figure 1: Forecast Spending on Enterprise Intelligent Assistants
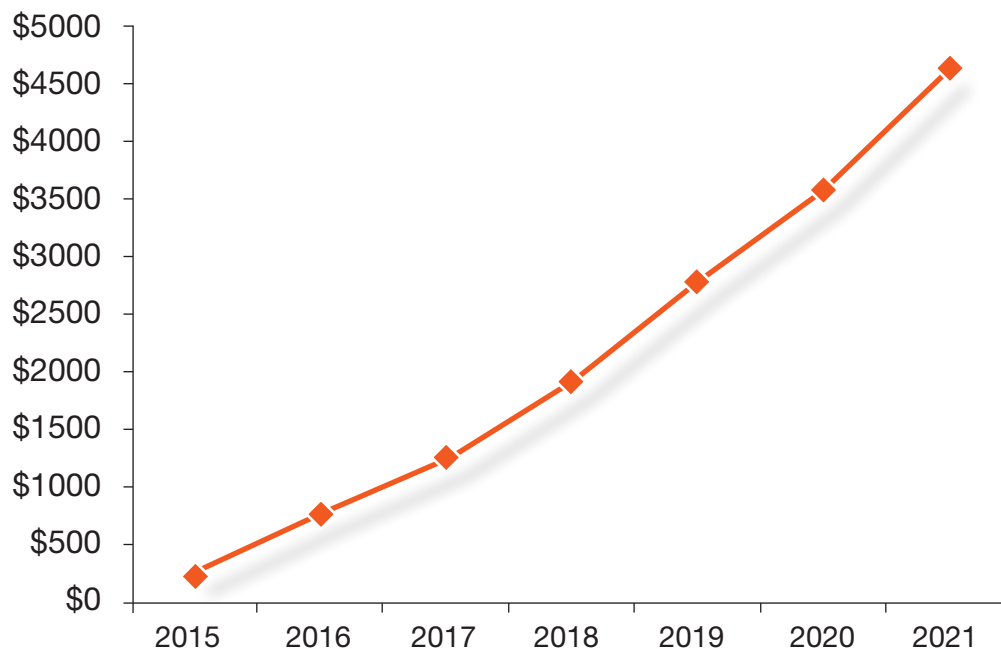
SOURCE: OPUS RESEARCH (2017)

The ranks of firms offering "Enterprise Intelligent Assistants" products and services under study for this report more than doubled, from 13 to 28 – an august group that accounts for over 2,700 deployments among a customer base approaching 1,200. Based on experiences and use cases shared by executives at these firms, Opus Research has derived the following:

Key Findings:

➤ To support competitive differentiation and omnichannel strategies, the age of Intelligent Assistance is being thrust upon Marketing, Customer Care and Digital Commerce executives around the world and across multiple industries; it is no longer a matter of "if" but "when."

➤ Solutions span two broad technological domains: "Conversational Technologies," spanning speech recognition, text input, avatars, emotion detection and biometric authentication and "Intelligent Assistance Technologies" melding natural language processing (NLP), machine learning, and semantic search with conversational analytics and knowledge management.

➤ Propelled by the "age of the bot," NLP-based intelligent assistant solutions, have entered the mainstream.

➤ Bot development suites represent a new category of emerging tools that brands may want to explore as they develop innovative strategies to reach customers and prospects on popular messaging platforms.

➤ Successful IA implementations reduce operating costs while improving customer experience and customer satisfaction scores by automating the handling of routine queries and optimizing person-to-person for both agent and customer when interactions require a human touch.

➤ Corporations and brands face the challenge of unifying disparate, single business unit bot projects into a focused bot strategy that embraces omnichannel deployment.

➤ Decision-makers pursue a holistic approach that leverages existing investment in knowledge management, CRM, analytics, Web commerce, chat and contact center and offers it through conversational interfaces that support today's channels and those to emerge in the coming years

➤ Companies with existing intelligent assistant solutions are ahead of the game and well positioned to continue leveraging and improving their investments.

The Brave New World of Bots and Virtual Agents

Since the dawn of the digital era, customer care executives have been charged with defining and investing in technologies that support engagement models that span a multiplicity of devices and channels. They often start with customer journey mapping exercises forcing them to weigh the relative merits of Interactive Voice Response (IVR) versus Visual IVR, chat agents versus virtual assistants, or mobile apps versus the mobile Web. All the while they've had to accommodate the staying power of The Classics: email and contact center agents.

Large retailers, financial service providers, diversified telecommunications, and travel and hospitality have long found ways to leverage investment in knowledge management, interaction analytics and natural language processing (NLP) technologies to improve customer experience. By opening inbound calls with an open-ended automated message ("How may I help you?"), they implemented self-service strategies that have proven to be quite effective and pleasing, even though they stopped short of "hiring" a fully automated intelligent assistant.

Then something happened. In mid-2016, sparked by a flurry of activity on Facebook's Messenger application, a call came down from the C-Suites:

"What is our Bot Strategy?"
Since then, time has been of the essence. Task forces have been formed. What used to be the domain of the "Technology Planning Group" or "Emerging Technologies Department" has moved to the mainstream. Global brands have found that they have launched many bot-like initiatives:

➤ **IVRs have evolved from simple "speech recognition" to support "How May I Help You?" natural language dialogue.**

➤ **Websites have virtual chat agents both on their "Contact Us" page and on any page where a "pop up" can appear to initiate a conversation.**

➤ **Branded avatars greet website visitors on the company's home page or may be invited to join a conversation on a search page or at check-out.**

➤ **Many mobile apps also feature virtual agents or avatars that respond to natural language input, either spoken or entered through a dialog box.**

➤ **In the contact center, agents are prompted with "best answers" that are illustrated in screen pops that appear on their workstations.**

The existence of such NLP-based solutions results from investment by one or more early adopters, champions or visionaries from business units that range from Emerging Technologies, Contact Center, Customer Engagement, Mobile or (increasingly) Marketing. Such investments used to be under the centralized control of the IT department but, to an increasing degree, they were initiatives carried out by "Shadow IT" departments attached to specific business units.

A "Bot" by Any Other Name:
Enterprise IA in the Age of Facebook

Enterprise-based, NLP-powered self-service solutions, also known as "Intelligent Assistants" (IAs), have gained traction and proven their value over the past ten years. Opus Research estimates that over 1,200 companies have implemented nearly 2,700 virtual agents that offer intelligent assistant services today. Yet, just as IAs appeared to be hitting their stride, an "open" approach to "chatbots" and "conversational commerce," led by Facebook, has created a brave new world of chatbots.

The rapid entrance of tens of thousands of bot developers and introduction of thousands of new "skills" has brought a new sense of urgency to inspire digital marketing and customer care professionals. It has also led to a good deal of confusion over terminology, functionality, and deployment strategies.

OPUS RESEARCH ESTIMATES THAT OVER 1,200 COMPANIES HAVE IMPLEMENTED NEARLY 2,700 VIRTUAL AGENTS THAT OFFER INTELLIGENT ASSISTANT SERVICES TODAY.

For the purposes of this report, Opus Research recognizes that enterprise decision-makers must cut through confusing concepts and terminology. Because bots, chatbots and enterprise intelligent assistants will co-exist and, ideally, converse with one another, we will operate with the these working definitions:

> ➤ **"Intelligent Assistants" are automated self-service resources offering consistent answers and responses to queries or instructions on behalf of brands or enterprise companies.**

> ➤ **"Bots" or "chatbots" are automated, conversational software agents deployed most often "inside" of a messaging app, such as Facebook Messenger, Slack, WeChat, Spark and others.**

Based on recent trends, we expect the terms "bot" and "chatbot" to be used interchangeably and more expansively to describe all customer-facing conversational user interfaces. Voice-based virtual assistants, like Apple's Siri, Amazon's Alexa, Google's Home Assistant, Microsoft's Cortana and all those that follow, will be referred to as "bots." Yet from the point of view of enterprise digital marketing and care professionals, they should be treated as "just another digital channel," albeit with its own set of protocols and "connectors."

Confusion over terminology will persist, but it should not deter intelligent assistant champions from recognizing and achieving the overall goal of deploying IA technologies to serve customers and prospects and achieving the specific goals of individual business units and the collective goals of customers and the entire organization.

Crossing the Conversational Commerce Chasms

The cry from on high for a "Bot Strategy" can be understood as a plea from management to avoid the overspending and stranded investment that a multi-channel approach entails. Historically, each channel has had its own customized user interface, knowledge management, analytics and reporting and business rules aimed at providing customers or prospects with answers.

Pursuing a single Bot Strategy can provide a framework whereby a centralized resource can be maintained with two specific functions:

> **Rapidly recognize - or anticipate - intent: Take in natural language input (spoken words or text) and apply natural language understanding to categorize the purpose of the call within the context provided of the customer's recent activity, location, preferences and entitlements.**

> **Respond with the best answer or action: Be the source of a single correct answer that is provided to customers regardless of whether it is spoken word or text and whether it is rendered over the phone, on a big screen or on the constrained area of a smartphone's display.**

Because conversations between brands and their customers or prospects span time, space, cyberspace, device and modality, it is more important than ever that answers be consistent across channels, and personalized to each individual.

Defining Enterprise Intelligent Assistants

In this document, Opus Research evaluates 28 firms that offer platforms that support development, deployment and refinement of Enterprise Intelligent Assistants or Virtual Agents. We describe the firms and their core products and services in Appendix A. The purpose is to provide information to help decision-makers evaluate how well they will help fulfill the requirements of Intelligent Assistance in ways that are consistent with each firm's business objectives and relevant performance indicators.

PROVIDING "INTELLIGENT ASSISTANCE" TO CUSTOMERS AND PROSPECTS HAS MOVED FROM STRATEGIC PROJECTS AND PROOF-OF-CONCEPTS TO DEPLOYMENT AT SCALE IN SHORT ORDER.

Enterprise Intelligent Assistants have made their way into customer care's critical path through chat, IVRs, contact centers and mobile apps. As they prove their ability to recognize an individual's intent and match it to the proper information, recommendations or sales personnel, they take on key support roles for marketing, tech support and customer retention. Now that they are mainstream, their performance can define customer experience in ways that that affect the key performance indicators for executives across nearly every business unit at companies supporting digital commerce.

Providing "Intelligent Assistance" to customers and prospects has moved from strategic projects and proof-of-concepts to deployment at scale in short order.
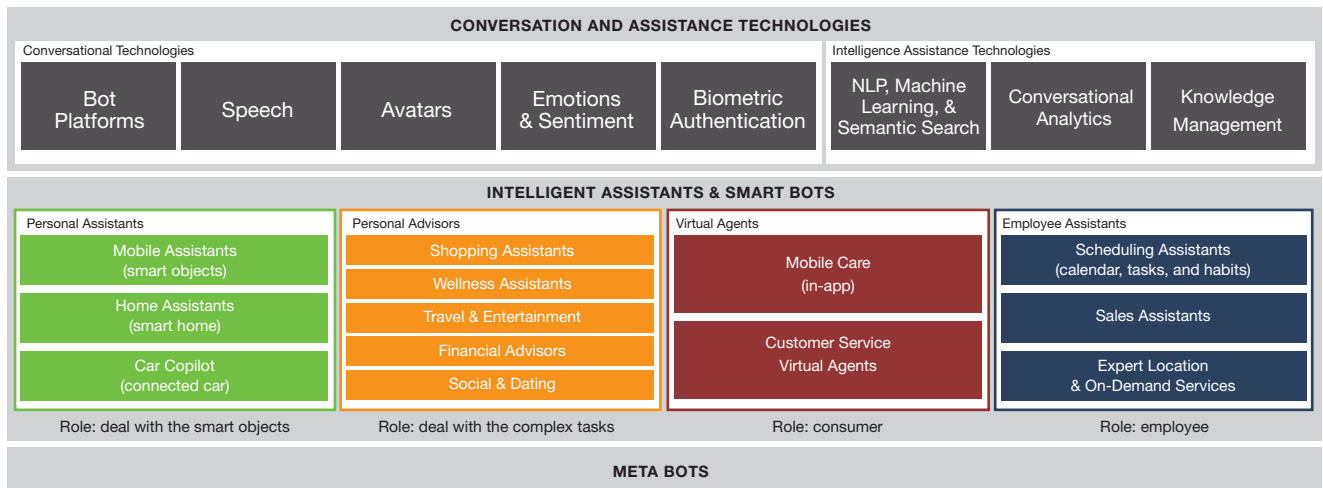
Introducing the New IA Landscape

Without benefit of a common vocabulary and shared landscape for Intelligent Assistance, those, like you, who are trying to keep up with technological advancement and competitive offers run the risk of getting beyond your own headlights. This document is designed for you. Below you'll find an illustration and description of the Intelligent Assistance and Bot Technology Landscape, followed by a focus on the leading vendors and trends that give shape to bot platforms and the deployment of virtual agents in enterprise settings, to support web chat, phone-based support and mobile apps.

Figure 2: Technology Stack for Intelligent Assistants and Bots

CONVERSATION AND ASSISTANCE TECHNOLOGIES							
Conversational Technologies					Intelligence Assistance Technologies		
Bot Platforms	Speech	Avatars	Emotions & Sentiment	Biometric Authentication	NLP, Machine Learning, & Semantic Search	Conversational Analytics	Knowledge Management

INTELLIGENT ASSISTANTS & SMART BOTS			
Personal Assistants	Personal Advisors	Virtual Agents	Employee Assistants
Mobile Assistants (smart objects)	Shopping Assistants	Mobile Care (in-app)	Scheduling Assistants (calendar, tasks, and habits)
Home Assistants (smart home)	Wellness Assistants		Sales Assistants
	Travel & Entertainment	Customer Service Virtual Agents	
Car Copilot (connected car)	Financial Advisors		Expert Location & On-Demand Services
	Social & Dating		
Role: deal with the smart objects	Role: deal with the complex tasks	Role: consumer	Role: employee

META BOTS

Conversational Technologies: The Front End of a "Smart UI"

The top row of the Intelligent Assistants Landscape depicts the functional components of IA platforms. It is divided into two rectangles: Conversational User Interface (UI) Technologies and Intelligent Assistance Technologies. These listings incorporate the comprehensive set of capabilities that should be considered when evaluating candidates for IA platforms or solutions.

Figure 3: The Conversational Front End

Conversational Technologies

Bot Platforms	Speech	Avatars	Emotions & Sentiment	Biometric Authentication
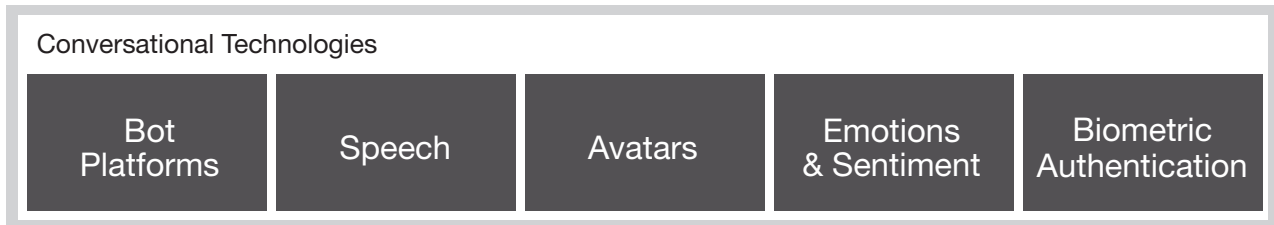
The major technology elements that comprise the Smart UI today, and for years to come are as follows:

➤ **Bot Platforms** – Nearly all solutions providers under investigation in Opus Research's first Enterprise Intelligent Assistants report started out as virtual agents for web chat, supporting text-based input. With the growth of the flavor of "Conversational Commerce" that refers largely to text-based communications over messaging platforms, this is a high-growth/high-potential channel. To avoid confusion, Opus Research includes only general bot hosting platforms and bot development suites in this category. [Note: Bot Platforms are described in-depth below]

➤ **Speech** – With recognition accuracy exceeding 90% and extremely human-like spoken output, Opus Research expects to see growing acceptance of voice as a universal interface for intelligent assistants on phones, smart home devices, consumer electronics, automobiles and retail kiosks.

➤ **Avatars** – Visual representations of virtual agents have long been a part of the presentation layer of conversational technologies. End-users like to anthropomorphize their intelligent assistants and the technologies to render animated beings, both life-like and phantasmagorical are steadily improving, making the conversational UI more immersive and engaging.

➤ **Emotion & Sentiment** – "Context is King" is one of the watchwords of effective digital commerce. In addition to the basics of location, purchase history, age, income and other status indicators, detecting and responding to the emotional state of an IA's client or customer is becoming vitally important. Judging platforms by their ability to show empathy and understanding will be more than a differentiator.

➤ **Biometric Authentication** – Newly added to the latest version of the IA Landscape, this category considers the ability to recognize and authenticate an end-user based on their touch (fingerprint), something they say or how they say it, or other means of authentication. This category is emerging as a crucial component to providing a highly-personalized, trusted link between individuals and their IAs.

Not all of the above categories exhibit the same level of maturity or general availability. As this report goes to press, bot platforms are at the center of attention with tens of thousands of developers building a flavor of IA for various messaging platforms, drawing a lot of attention to the non-spoken input and output: text, emojis,

prepackaged buttons and carousels. As we discuss in our contrast between basic bots and their enterprise-grade cousins, not every offering has to employ all available functions. Simplicity and cost considerations will prevail.

Intelligent Assistance Technologies

The rectangle on the right side of the top row is where the magic happens. These resources provide brands with the ability to recognize an individual's intent quickly and find the best answer to a question or the best action to suggest in response to a command.

Figure 4: Enterprise Intelligent Assistance Components

Intelligence Assistance Technologies

| NLP, Machine Learning, & Semantic Search | Conversational Analytics | Knowledge Management |

➤ **Natural Language Processing, Machine Learning and Semantic Search** – These computing and database management resources can be either "rules based" or employ deep neural networking to teach themselves how to recognize the meaning of all the data they coarse through, from textbooks, journals, newspapers, and elsewhere to then match with the requests from individual customers, prospects, clients or members.

➤ **Conversational Analytics** – Many large, sophisticated enterprises and brands have already invested computing resources that monitor customer interactions (call center recordings, chat transcripts, etc.) to detect patterns that correlate with successful interactions or detect when companies must take remedial action. Applying these lenses to real-time conversations will make IAs more efficient and predictive in what they are offering.

➤ **Knowledge Management** – As IAs proliferate and expand their capabilities and areas of expertise, it is becoming increasingly evident that each company's knowledge base (be it product literature, CRM records, chat transcripts, or FAQs) is the raw material that makes Intelligent Assistance possible.

Great attention should be paid to a potential solution provider's methods for ingesting and organizing data (both structured and unstructured) from a variety of sources. In addition to FAQs, the material to be included should include chat transcripts, call recordings and transcripts, product literature and manuals and threads from social platforms, all with an eye to those that represent "best answers" and successful resolution.

Intelligent Assistance, therefore, is the result of the artificial intelligence resources making the best match between the information it has ingested and the requests coming from individual customers or clients. For the purpose of understanding the context of a call, it will be advantageous to integrate information about the individual making contact, preferably in real time. It is routine for companies to know a customers' location, the device they are using and its capabilities, information on recent activity (especially regarding the company's website or activity within the mobile app) and their "status" as a preferred customer or member of the company's loyalty program.

A WORD ABOUT METABOTS

As depicted in the bottom layer of the Intelligent Assistants Technology Stack above (Figure 2, p. 10), Opus Research has identified a horizontal-reaching layer called "MetaBots." This section consists of the likes of Siri, Google Assistant, Amazon Alexa and Samsung, among others, as all are vying for a position of primacy above all other personal intelligent assistants.

These well-known properties are embedded in digital devices prevalent in our daily lives (phones, homes, cars) and represent a "metabot" that operates on an individual's behalf. Currently, each are in various stages of developing their own rich, third-party ecosystems which puts them in the position of unhooking the direct link between brands and their customers.

Going forward, it will be interesting to see how MetaBots are changing consumer expectations. What standards and protocols will be required to enable individuals to use his or her own words to express intent, find things, make purchases or simply carry out conversations that involve other bots, friends or other people (e.g. subject matter experts)? What authentication methods are needed to ensure secure, personalized communications for transactions and services? And what role do brands and enterprises have this disintermediated "metabot" world?

How to Build an Enterprise IA

It is a team effort for companies to aggregate, store and manage the information that powers Intelligent Assistance. The team's members come from a variety of departments and business units. But existing keepers of knowledge management and customer care resources have historically and rightfully played a key role.

Intelligent assistant platform providers are "democratizing AI" by designing solutions that include employees with specific knowledge and expertise. They serve as subject matter experts in their professional disciplines and can focus on successfully achieving their business goals are designed to maximize subject matter expertise while minimizing the need for special expertise in, arcane disciplines like computational linguistics.

Bots on Messaging Platforms: Today's Shiny Object

While digital commerce, customer care and self-service specialists in enterprise settings made strategic investments in intelligent assistant resources dedicated to their specific brands, 2016 witnessed the emergence of ecosystems that support the deployment and operation of conversational software agents to carry on conversations that cross a multiplicity of communications channels. For marketing and customer care veterans in the digital domain, the sense of déjà vu is strong. In the 1990s, every company had to build its e-commerce website from the ground up. Then they had to "make it mobile" to accommodate the growing population of cellphones with browsers. Next came the need to build mobile apps that brought with them the hope that downloading a dedicated executable program equated to "stickiness" and loyalty.

Chatbots are the latest in a long line of digital touchpoints for customers and prospects. While the term "bot" still carries unsavory connotations from times gone by — from the days when "spambots" cluttered email boxes and other bots came baring computer viruses as payloads — it seems to have largely overcome its baggage and emerged as the dominant moniker for conversational, non-human agents that engage users over messaging or SMS channels.

Adoption is driven by unprecedented use of text-based communications among nearly every demographic cohort, but especially millennials. Overall, individuals are showing a preference for text-based chat over phone-based conversations when interacting with digital retailers. A recent study by solution provider [24]7 showed that nearly 30% of consumers preferred chat "when making a purchase." Thirty-seven percent of millennials identify chat as their favorite way to contact companies and express a preference for using text on a messaging service as it is made available by companies.

The trend toward chatbots on messaging platforms has been recognized and reinforced by the venture capital community as well. In her annual presentation of "Internet Trends" Mary Meeker of KPCB took notice of the rapid growth of mobile

BOT PLATFORMS

messaging, led by WhatsApp, Facebook Messenger and WeChat to describe how they are evolving to support "Business-Related Conversations," that spans banking and financial services, taxi services, payments and "online-to-offline" interactions and transactions. That represents the Manifest Destiny of Intelligent Assistance.

Two Types of Platforms: Ecosystems versus Development Suites

The excitement and hype surrounding conversational bots that operate within popular chat apps are beginning to give way to pragmatic solutions. As the dust settles, the bot landscape is coming into clearer focus. For purposes of this discussion, we divide the world of bot platforms into two separate and distinct entities. On one side of the equation are bot ecosystems, which we define as the places where bots live. These ecosystems consist of popular consumer-focused messaging apps such as Facebook Messenger and WeChat. Bot ecosystems also encompass enterprise-based messaging platforms such as Slack and Skype. On a global basis, we've seen implementations on LINE, Kik, Viber and many others.

THE EXCITEMENT AND HYPE SURROUNDING CONVERSATIONAL BOTS THAT OPERATE WITHIN POPULAR CHAT APPS ARE BEGINNING TO GIVE WAY TO PRAGMATIC SOLUTIONS.

On the other side of the equation are bot development suites. These platforms consist of a set of tools that enable developers and, increasingly, departmental staff at many businesses to create bots that can be deployed across bot ecosystems. Bot development suites promise companies quicker development times and ease of deployment across multiple messaging platforms.

Two Types of Bot Ecosystems

Bot ecosystems can, themselves, be further divided into two main categories:

➤ **Consumer** – Top consumer messaging apps ecosystems (alphabetically) are Facebook, Kik, LINE, Telegram, Viber and WeChat.

➤ **Enterprise** – Where top platforms include HipChat, Slack and Skype for Business.

As companies build their bot strategies, they must consider that each messaging platform operates its own bot ecosystem. Each can support branding efforts and provide consistent answers or defined options, but bot developers will find that they must code their bots and then "publish" according to the rules defined by the bot platforms application programming interface (API). Although many platforms support similar capabilities (like service creation, security, analytics and reporting) currently, there are no cross-platform standards. Yet there are key differences in features and functions that make cross-platform bot deployment challenging.

Competition Among Bot Ecosystem Providers

Since the launch of their bot platform in April 2016, Facebook has emerged as a leading innovator in the bot ecosystem space. The company has been rapidly evolving the Messenger platform, adding many new features to support businesses and bot developers. A few recent developments include the ability for users to make purchases directly from within the bot interface, as well as the ability for brands to direct users to a chatbot conversation from a Facebook newsfeed ad.

While Facebook Messenger has gained considerable traction within North America, WeChat maintains a big lead among Asian consumers and, in particular, Chinese users. Kik, LINE, Telegram, and Viber are also not standing still. Each provider clearly recognizes the potential for advertising and other revenue that stems from enabling businesses to engage with users via bots. As Facebook barrels forward, the other top bot ecosystem operators have yet to be left behind.

Bot Development Suites

Many have jokingly compared the current bot craze with the California gold rush of the mid-19th century. The conventional wisdom states that those who reaped the biggest rewards from the gold rush weren't the miners themselves, but rather the purveyors of picks and shovels. Not surprisingly, the explosive hype around Facebook's Bot Platform announcement in April 2016 was quickly followed by the launch of one bot development suite after another.

While it is difficult to evaluate all of these recently emerged platforms, the common denominator is "democratizing AI" or fulfilling their aim of enabling a business to build and deploy a chatbot without coding or other deeply technical commitments. These development suites also take advantage of the fact that cross-platform bot deployment is still complex.

Just as with bot ecosystems, bot development suites can be divided into two general categories: those designed for techies and those aimed at non-techies.

Suites such as API.ai and Wit.ai are well-suited to individuals with some technical, and ideally programming, background. Both of these platforms were acquired by much larger players. Wit.ai was acquired by Facebook (January 2015) and API.ai by Google (September 2016). These tools have built-in natural language processing functions and enable a developer to map user intents to subsequent actions.

At the other end of the spectrum are tools such as Chatfuel and Motion.ai. These platforms are designed with the business person in mind, such as someone experienced in creating marketing content. The tools are generally graphical and guide the content creator through the process of developing a dialog flow.

Other categories of bot development tools are also emerging. These include tools for quickly prototyping and testing bot conversations and analytics platforms that collect and analyze data from user interactions with bots.

Trends in the Bot Space

As more companies take the leap into the world of bots, deploying their first conversational agents across popular bot ecosystems, several trends are beginning to emerge.

Experimentation with Narrow Focus

After much initial hype around the earth-shattering potential of chatbots, expectations are now being tempered by more realism. Many brands are rightly enthusiastic about the possibilities that bots present. But at the same time, early disappointments with bots have taught companies to proceed with caution. Most chatbot deployments on bot ecosystems are narrowly focused, rather than overly ambitious. Brands are stepping out to see what works and what doesn't and using data provided by freshly minted analytics tools to plan their next moves.

> MOST CHATBOT DEPLOYMENTS ON BOT ECOSYSTEMS ARE NARROWLY FOCUSED, RATHER THAN OVERLY AMBITIOUS.

Emergence of Analytics Tools

As bot ecosystems mature, so are the quantity and quality of accompanying analytics tools. Brands and developers want to see where user engagement is coming from, who is being engaged, and if engagement leads to desired follow on actions, such as purchases, more clicks, and more website engagement.

Facebook recently added analytics for bots to its Facebook Analytics for Apps platform. Other bot ecosystems are following suit and even competing with independent bot analytics providers, such as Dashbot. Bot analytics offer a solid opportunity for brands to hone in on strategies that produce the most desirable results and return on investment.

Bots for Brand Engagement vs. Customer Support

Bots and conversational interfaces are still widely regarded as immature. As a result, most companies are hesitant to use the current generation of bot platforms to provide mission critical services. Most bots offered by existing brands tend to be aimed at engaging new prospects or offering fun conversational shopping experiences to existing customers.

Important customer service transactions, on the other hand, largely remain the domain of human-staffed helpdesks or more sophisticated desktop-based intelligent assistant solutions. Bots are fine for offering non-critical conversations that engage and entertain. If these conversations fail or disappoint, no real harm is done. As the technologies mature, more important customer service interactions will likely find their way onto bot ecosystems.

New Types of Interactions

Providers of messaging apps have seized the opportunity to offer a new engagement model. Chat app users can now communicate directly with consumer brands through a chatbot that behaves like a peer to their network of real-world friends. While texting with friends, users can shop with the assistance of a chatbot and even complete a purchase without ever leaving the messaging platform. Bots provide a new, low-cost means for brands to reach prospects and existing customers where they naturally spend most of their time: in the mobile space.

Issues with Discoverability

Just as it was difficult to discover apps in the early days of their existence, people don't have an easy way to find bots waiting to communicate with them within messaging ecosystems. The average person can't be expected to consult one of the many lists of curated bots to find those they want to converse with. Some platforms, including Slack, Kik, and Telegram, support bots in group threads, which enhances discoverability. Facebook Messenger doesn't yet support the group thread feature. It does, however, now allow businesses to direct users from a newsfeed ad to a chatbot conversation. If bots are to become more popular across a broad spectrum of users, new and better ways to discover bots will need to emerge.

JUST AS IT WAS DIFFICULT TO DISCOVER APPS IN THE EARLY DAYS OF THEIR EXISTENCE, PEOPLE DON'T HAVE AN EASY WAY TO FIND BOTS

Progress Towards Contextual Awareness

The current generation of bots is hampered by a general ignorance of context. When a user messages a chatbot to begin an interaction, the majority of bots don't have a memory of previous engagements. The user has to re-establish who they are, why they're talking to the bot, and what they need. Many bots don't have access to information available to traditional smartphone apps, such as the user's location. This lack of awareness makes today's bot conversations cumbersome, canceling out most of the benefits the user might receive from using natural language. Technologies are being developed to solve this shortcoming, one of which is Google's Awareness API. Other bots, such as Kasisto's Kai, have already addressed this problem by requiring users to authenticate before using the bot.

Sample Bot Platform Use Cases

Despite the limitations of current bot platforms, developers are jumping in with both feet to deploy conversational solutions that address a wide range of opportunities. Below is a brief overview of some sample bot use cases.

Prospecting Brand Bots

A common use case in these early days of bots are those aimed at widening the top of the sales funnel. Two brands with bots attempting to drive in new prospects are Absolut Vodka and Burberry.

Absolut operates a bot on the Facebook Messenger platform that acts as a virtual bartender. When a user engages with the bot, it gets straight to the point by offering a complimentary cocktail from a nearby bar. Participating bars are currently limited to a few large cities within the U.S., but if the user is lucky enough to be in one of those areas, he or she can choose from several Absolut drinks and receive a code redeemable for a free drink.

Burberry, the luxury fashion house, also offers a Facebook Messenger bot. The bot acts as a shopping assistant, suggesting gift items to suit a variety of tastes and budgets. Users can purchase through the bot or switch to a live chat. But the primary task of the bot seems to be to introduce people unfamiliar with the brand to the rich Burberry history. The bot engages the user in a conversation about the story of founder Thomas Burberry. It also provides a preview of a movie about Burberry's life and invites the user to learn more about the actors and actresses in the film.

Standalone Advisor Bots

A new generation of standalone transactional bots has emerged to take advantage of the conversational commerce platform offered by messaging apps. SnapTravel is a prime example of such a standalone bot. SnapTravel operates a bot service on Facebook Messenger that uses a hybrid of software and human agents. The service acts as a virtual travel advisor enabling people to request hotel rooms and then book the room through an external service. The entire interaction is conversational. The bot or human agent asks questions to get all the specifics about the traveler's requirements. The bot then returns three hotel options considered to be the best value based on the traveler's needs and profile.

A NEW GENERATION OF STANDALONE TRANSACTIONAL BOTS HAS EMERGED TO TAKE ADVANTAGE OF THE CONVERSATIONAL COMMERCE PLATFORM OFFERED BY MESSAGING APPS.

Enterprise Team Bots

Team communication platforms like Slack offer a rich opportunity space for automated bots. Bots are useful at assisting with cross team information gathering, which can be as simple as collecting lunch orders and as complex as helping manage projects.

Howdy is an example of a popular Slackbot with over a year's worth of traction. The friendly bot engages with members of a team to request updates on key activities. The bot compiles the updates into a summary that can be used to facilitate daily stand-up meetings. The Howdy team has leveraged the success of its team bot to offer Botkit, a set of tools that enables others to build their own Slackbots.

Recommendations: Time to Get Started

While the bot ecosystem is still immature, now is the time to start gaining experience with bots and test out what works and what doesn't. Even the most recent Black Friday & Cyber Monday statistics in the U.S. underscore the consistent migration of consumers away from brick and mortar to online commerce. As the population shifts heavily towards mobile, conversational interactions with customers present too great of an opportunity to pass up.

WHILE THE BOT ECOSYSTEM IS STILL IMMATURE, NOW IS THE TIME TO START GAINING EXPERIENCE WITH BOTS AND TEST OUT WHAT WORKS AND WHAT DOESN'T.

While bot ecosystems are still maturing, it seems prudent for established brands to view bots differently from virtual customer self-service agents. Customers and prospects who interact with a brand's virtual agent on the web or on mobile have a higher expectation of the quality of the information they receive. They need the virtual agent to answer their question cogently so that they can complete their transaction, be it before or after the sale, and move on with their day. Customer service is not the best place for chit chat or exposure to new brand experiences.

Bots that live on popular messaging platforms represent a new opportunity. They offer a way to connect with a vast number of potential new customers, interacting with them on their own turf and in their own language.

As bot ecosystems mature, experiments in customer conversations are bound to lead to a better understanding of the most viable use cases for bots. The opportunity to leverage conversational interfaces to provide customer service, even from within messaging apps, is most likely just around the corner. When that opportunity arrives, companies that have pioneered the use of natural language based intelligent agent solutions will be well-positioned to leverage those investments.

Focus on Enterprise Intelligent Assistants (EIAs)

While the race for bot supremacy unfolds in the consumer market, there remains a significant body of prior development activity that has occurred largely within the confines of enterprise firewalls in the guise of multichannel customer care IT infrastructure to develop intelligent assistants.

In documenting the growth of intelligent assistants for this report, Opus Research counts over 2,700 enterprise-grade deployments among a customer base of approximately 1,200. These offerings include consistent features such as the ability to capture customer intent, integrate with customer care resources and learn over time.

Recognizing Intent and Rendering Right Answers and Actions

For many years, the most widely deployed enterprise intelligent assistants were little more than natural language front ends to answers to the FAQs on a company's website. Knowledge aggregation and management efforts were modest. Very little integration took place. Vendors or internal developers fed the contents of the FAQs into a "categorizer" or natural language understanding resource and after a few weeks of training, a bot could recognize the question being asked and serve up an answer from the website, as long as the question being asked was among those answered in the FAQ.

In the best case, static answers in an FAQ can be used to respond to about 80% of customer queries. For outliers, the intelligent assistant would respond with "I don't know the answer to your question" or, more properly, escalate the session to a live agent. Thus, the earliest integration of IAs into customer care workflows was to add the ability to route a question to a live care agent, preferably with a transcript of the ongoing interaction and a record of the issue under investigation.

This type of "warm transfer" calls for the IA platform to be integrated with the information management and telecommunications infrastructure that support contact centers, websites and employee collaboration platforms. Like a bot on a Facebook Messenger, the enterprise IA can be seen as an automated resource that recognizes and captures the intent of a customer and shares or transmits to resources that can complete the task or provide correct answers.

Ongoing Learning

Correct answers are a moving target and providing correct responses to customer questions is a dynamic process that combines machine learning with human input. When evaluating enterprise intelligent assistant platforms, ensure that their solutions will prompt individuals to "rate" answers and recommendations and define the best ways to respond in the future.

It is also important to keep humans involved in so-called "machine learning." Feedback and suggestions from departmental employees and subject matter experts must augment "pure" machines and algorithms as part of the learning process.

Creating Effective Workflows

Ideally, the intelligent assistant serves as first point of contact for customers or prospects with a specific goal in mind. It starts by asking or ascertaining "How may I help you?" Based on input from the customer, it recognizes whether it has been asked a question or given a command. If it is a question, its job is to understand what is being asked and quickly determining whether it has a "true" answer. If there is high confidence that it has the answer, it provides it to the customer and moves to the next step.

If the IA doesn't have an answer, it is programmed to route the query elsewhere. It can ask whether the individual wants to see answers from the company's social networks. It can route to a live subject matter expert. The

IA's ability to recognize the "category" or purpose of a call-in order to do an effective job of routing the request correctly is the essence of Natural Language Understanding.

Efficient and accurate categorization also makes it possible to determine other "next best actions." For instance, if a customer calls to learn of the outstanding balance on her bill, the IA can provide the information quickly and accurately, and then it may ask whether she wants to make a payment, as a courtesy. It is the ability of an IA to move from responding to a question to suggesting a next action that has attracted the attention from marketing.

During the course of a conversation between a trusting customer and a trusted IA, there will be ample opportunities to recommend new products and services. As long as the conversation is not blatantly promotional, it is often a very effective way for a company to make a client aware of a better deal or service of interest. This type of interaction can feel very natural.

Keeping People in the Equation

Opus Research makes a point of differentiating between general Artificial Intelligence (AI) and Intelligent Assistance (IA). "IA" has correctly been characterized elsewhere as "Intelligence Augmentation," meaning that massive computing and analytic resources are used to make mere mortals more effective at what we're doing.

When evaluating IA alternatives, it should be regarded as a "plus" when solutions are architected to include input from relevant employees. We've already described a role for subject matter experts in evaluating the quality of correct answers. Several platforms under review in this document include live agents "in the background" to interpret users, "disambiguate" unclear input or even make suggestions or recommendations based on their subjective opinions. These sorts of approaches bode well for maintaining a balance between humans and machines for years to come.

Integration to Enterprise Backend Systems

Today's enterprise intelligent assistant solutions are becoming increasingly more complex. Much like Google lays claim on the idea of organizing the sum total of all machine-readable information, today's EIAs are conversational UI's to the sum total of an enterprise's base of both structured and unstructured knowledge, including product literature, marketware, chat transcripts, training materials and the like.

Because the best responses are "context-aware," robust EIAs also consider a myriad of metadata that includes real time information about the individual who is contacting the company. Location, status, entitlements, transaction history, recent activity on the company website or in an IVR are all important triggers to defining the most appropriate response. Integrating into backend CRM systems will prove to be a differentiating factor for successful enterprise intelligent assistants.

Figure 6: Solution Provider Comparisons

	In Brief	Automated Learning	Process Automation	Human Involvement	Analytics & Reporting	Multi-channel	Track Record	Affordability Speed to deploy
[24]7	Two versions of virtual assistant: "Answers" (quickstart) and AIVA (AI-based)	2	1	2	1	1	1	2
AgentBot	Automated omnichannel customer service	2	3	3	3	2	2	1
Artficial Solutions	Coined term "Natural Language Interaction" (NLI)	1	2	2	2	1	1	2
Aspect Software	Originated Interactive Text Response (ITR)	2	1	3	1	2	2	2
CogniCor	Targets financial services	3	3	2	3	1	2	2
Conduent	Large BPO services company Spin-off of Xerox	1	1	2	2	2	1	3
Creative Virtual	Trademarked V-Person & V-Portal	2	1	2	1	1	1	2
CX Company	DigitalCX promotes rapid deployment and easy admin	2	2	2	2	2	1	1
Digital Genius	Applies deep learning algorithms for customer service	1	2	1	3	2	2	2
Do You Dream Up	Self-service specialists for Q&A	3	3	2	3	3	1	1

	In Brief	Automated Learning	Process Automation	Human Involvement	Analytics & Reporting	Multi-channel	Track Record	Affordability Speed to deploy
Flamingo	Guided selling platform; Collaborative Customer Interface	3	1	2	2	2	2	2
IBM Watson	Cognitive Computing. Conversation, virtual agent	1	1	2	1	2	2	3
Inbenta	"Intelligent Chatbot for Business"; Consistent responses	2	2	3	2	2	1	1
InteliWise	Tools for Virtual Assistance	2	2	2	2	2	2	1
Interactions	Human-assisted adaptive understanding	2	2	1	2	2	1	1
IPsoft	Amelia is a Digital Employee	1	1	2	1	2	2	3
Living Actor	Unique, speech-enabled Automated	3	3	3	2	3	3	2
NanoRep	Cloud-based self-service products	1	2	3	2	2	1	2
Next IT	Human Emulation Application Development	2	1	1	1	1	1	2
noHold	SICURA, knowledge mgt. and Natural Language Search	2	2	2	2	2	1	1

	In Brief	Automated Learning	Process Automation	Human Involvement	Analytics & Reporting	Multi-channel	Track Record	Affordability Speed to deploy
Nuance	NINA, speech-enabled and human assisted virtual assistants	1	1	1	1	1	1	2
Omilia	One platform, one integration – all channels and formats	2	2	2	2	1	3	1
Personetics	Personalized self-service solutions for banks	2	2	2	2	2	2	2
Sabio	IT Consulting and Design. Nuance Solution Provider	1	1	2	1	1	2	2
SundownAI	Offers Cloe, powered by own NLP/ML resources	2	2	3	3	2	3	1
Synthetix	Long-time online customer service specialist	2	2	3	2	2	2	2
True Image Interactive	Human-like (Animated Visual and Voice) IA	3	3	2	2	2	2	2
Verbio	Provides IA Framework	3	2	2	2	1	3	2

Automated Learning	Process Automation	Human Involvement	Analytics & Reporting	Multi-channel	Track Record	Affordability Speed to deploy
1	1	1	1	1	1	2

Nuance
Headquarters: Burlington, MA
Website: http://www.nuance.com
Date founded: 1992
Number of employees: 13,500
Revenue: Non-GAAP revenue of $1,979.6 million in FY16

Core Intelligent Assistant (IA) Products and Services:
Nuance launched Nina, the "Nuance Interactive Natural Assistant," as a speech-enabled natural language interface for mobile apps in mid-2012. In August 2016 Nuance acquired Live Chat and Data Analytics specialist TouchCommerce and, together, they offer a suite of products and services that span:

- Conversational AI (including Conversational interactive voice response (IVR), Mobile, Web, Messaging, Social, Digital Self & Assisted Service)

- Human-Assisted AI (Human Assisted Virtual Assistant) (HAVA)

- Cognitive AI (Targeting Engine, Machine Learning, Knowledge, Prediction, Speech, Voice of the Customer)

- Supported by end-to-end analytics and informed by insights from 200M Live Chats; 1B Web Journeys; 14B Self-Service Transactions

- In 2017 the suite will be enhanced with more seamless integration of self- and assisted services, including the introduction of "hidden agent to support a semi-automated learning loop.

All are supported by a common Customer Engagement Platform that supports web, social and mobile channels, and employs the following components:
Nina Virtual Assistant: Nina offers the best of both self and assisted customer services solutions for enterprise companies, powered by Nuance that capture the intent of the conversations to provide rapid and relevant answers to customers' queries. Nina can be broken down into:
- **Applications & Services** (Text-to-Speech, Dictation, Natural Language Understanding, and Dialog Management)

- **Data** (Dialogs, NLU models)

- **Tooling** (IQ Studio – common dialog tool and NES – Nuance Experience Studio, a common grammar tool)
- **Targeting** – with addition of TouchCommerce targeting engine – ability to offer the right experience to the right consumer at the right time
- Seamless experience when escalating/transferring to Nuance live chat experience

Customer Engagement Strategy
Consultative sales approach combines the delivery of software technology with professional service experts including digital analysts, graphic, UI and content designers, big data reporting experts, customization engineers, optimization strategists, voice of the customer analysts and speech scientists.

Revenue Models:
Initial start-up fees and then licensing of core software that varies by size of company, size of customer base or activity. Professional services are deployed for continued optimization.

Models vary by customer but in general include a transactional component (tiered session or per session models) and ability to provide a gain share model where the success of the Virtual Assistant is tied to pricing.

Verticals Served (ranked by share):
Telcos, Financial Services, commercial products and travel and entertainment, restaurants and eGovernment.

Highlighted Customer Use Cases:
Swedbank: handled 30,000 conversations within three months of deployment. Now handling 50,000 conversations and constantly adding volume and skills, now capable of answering 350 questions.
IP Australia: Trademark office in Australia employs Nina to help Website visitors apply for patents. Initial results indicate 80% of customer inquiries resolved by the virtual assistant.
Australian Tax Office: Web-based handling of more than 900,000 conversations from March-November 2016.

Key Differentiators:

➤ "Full Suite" of intelligent digital engagement offerings, started with "speech-first" approach supported IVR, Mobile then evolved to add texting, chat, messaging, as well as communications over Amazon Alexa, Facebook Messenger, Skype, Kik, Slack and others.

➤ Proactive, targeting capabilities (built on Targeting Engine) incorporating seamless transfer to live chat and features such as cobrowse, call-to-chat and other routing enhancements.

➤ Tools for NINA: IQ Studio builds dialogs quickly now enhanced with Experience Studio so that non-technical personnel can build dialogs

➤ PCI compliance and tight integration of biometrics-based authentication.

About Opus Research

Opus Research is a diversified advisory and analysis firm providing critical insight on software and services that support multimodal customer care. Opus Research is focused on "Conversational Commerce," the merging of intelligent assistant technologies, contact center automation, intelligent authentication, enterprise collaboration and digital commerce. **www.opusresearch.net**

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