Foundations 2009: Voice Self-Service Meets Web 2.0

Phone-based self-service has taken on new meaning as phones morph into multi-functional wireless devices and contact center functions are distributed throughout the globe. Conversational Access Technologies now involve asynchronous interaction among individuals using Web services over the phone lines. Adding the human touch to traditionally automated self-service activities gives companies the option to leverage existing staff and IT infrastructure or outsource operations to managed service providers.

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Key Findings:

This will be the final forecast for Conversational Access Technologies. Economic circumstances and architectural changes have changed the ecosystem forever, in the following ways:

- **Customer care is taking on a Web 2.0 flavor** – Changes take place at the speed of a Web site; interaction takes place between people over multiple channels in multiple formats.
- **"Conversational access" crosses space, time and channel** – IP-telephony and Web standards have forever changed enterprise spending on customer care.
- **Self-service has added a social layer** – Human intervention in self-service callflows and workflows is now the norm.
- **Enterprise spending patterns have shifted** – Companies spend on professional services and support to extend the life of existing infrastructure while fulfilling new sets of requirements.
- **IBM's licensing of source code to Nuance signals the end of an era** – Big Blue ran the numbers and determined that it was time to accept upfront money, rather than make further investment in solution development.
- **Development environments support disaggregation** – The "creative destruction" of existing solutions is made possible by refinements to the sets of development tools and dashboards to support new members of the Web 2.0 developer community.
- **Platforms learn to thrive survive "in the cloud"** – To extend self-service and assisted service to telephones, speech processing and call processing has learned to talk to cloud computing resources like Amazon's EC2, Salesforce.com's ServiceCloud and Voxeo.
- **Enterprises attach a greater premium to professional services** – Spending on application development, maintenance and refinements shows double digit growth during the forecast period.
- **Customer satisfaction takes precedent over automation rates** – After many years of lip service, major companies are paying attention to their caller experience and linking satisfaction to process automation and investment plans.
- **The economic downturn acts as an innovation accelerant** – Enterprises in all business verticals look for better ways to carry out their business and reach their customers.

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Changing Channels: CAT Meets Web 2.0

Contact center operators, outsourcers and infrastructure providers recognize that the art and architecture of contact centers for sales, support and general customer care change as quickly and dynamically as the enhancements to the corporate Web site. Indeed, we live in a Web-centric world which is, to an increasing degree, delivered to people over wireless networks using mobile devices.

Email, text messages, blog posts, chat streams and even Twitter "tweets" are making their way to a shopper or customer's "workflow," and they often originate or terminate on a mobile handset. The "ordinary" phone is seldom the channel of first resort when an individual initiates his or her quest for products, services or support. Nonetheless, real-time, voice-based conversations with speech-enabled IVRs (interactive voice response systems) and live agents remain vital resources to support common enterprise business objectives, such as closing sales, pleasing and retaining customers, and promoting new products and services.

Where IVRs and ACDs "Fit"

Today's customer care and self-service infrastructures leverage investment in a long-standing legacy of telephony switches, IVR systems, agent workstations, back-office database servers, application servers and the like. The long life expectancy of these time-tested systems had been a major gating factor in tempering the all-out migration to broadband IP-based networks, Web application servers and middleware. The other major issue has a decidedly human element to it. Contact center managers and the executives in charge of marketing or customer care are often late adopters of new technologies giving shape to the era of Web 2.0. Their first-order concerns are, rightfully, the levels of comfort and satisfaction of their customers, employees and supervisors.

New technologies do not pass them by; instead the new technologies become their new milieu, the environment in which they operate. They exist and carry out business in a world that supports communications over multiple channels and uses voice processing and call processing technologies to transcend time, distance, language, real-time availability and other constraints of the physical world. The persistent presence of contact center agents who are trained experts in the product descriptions, service offerings, as well as policies and procedures of a specific company vendor, are part of the foundation of quality customer care.

Defining Web 2.0

The term "Web 2.0" was coined back in 2004, and was formalized when O'Reilly Media held a conference on the subject in 2005. From the decidedly geeky perspective of application developers, it refers to the deployment of infrastructure (primarily software) to support more open communications,

secure information sharing, interoperability across what were formerly "islands" of connectivity (walled gardens created by enterprise WANs, instant messaging services and directories), and collaboration on the Web.

Tim O'Reilly summed the trend toward Web 2.0 in five major points paraphrased below:

- **The Web is the platform** – Refinements in Web-based standards and the bells or whistles added to e-commerce Web sites shape user expectations and usage patterns.
- **Communications can harness collective intelligence** – As the growth of blogs and recommendations engines attests, 'user-generated content' is succeeding at the expense of old media and promotional channels.
- **Data [and metadata] powers everything** – O'Reilly actually said "Data is the 'Intel Inside'," meaning the invisible engine driving adoption across multiple channels is information and content that is shared across the entirety of Web sites and end-users.
- **Open, rapid development of applications and services** – This brings Web 2.0 its dynamic quality – the pace at which new services were initially introduced was governed by the release cycles of comparatively few companies. Now, virtually anyone can get into the act.
- **New "lightweight programming models" accelerate changes** – This is the geekiest of the comments. It refers to the use of easy-to-understand toolkits or meta-languages to simplify development, testing and rollout of new services.

As these principles gained acceptance users made the Web into the electronic marketplace. It is where they go to search for products and services; gather views and advice; make selections; and perform transactions. Yet, as evidenced by the steady and increasing traffic in and out of contact centers around the world, phone-based interaction remains a major part of the customer care flow. In the new environment, we counsel customer care specialists to embrace the new, so-called Web 2.0 technologies. It provides for more "touch points" with customers and, at the very least, it keeps the jobs of contact center agents more interesting and vital.

Support for Voice Self-Service: A Growth Industry

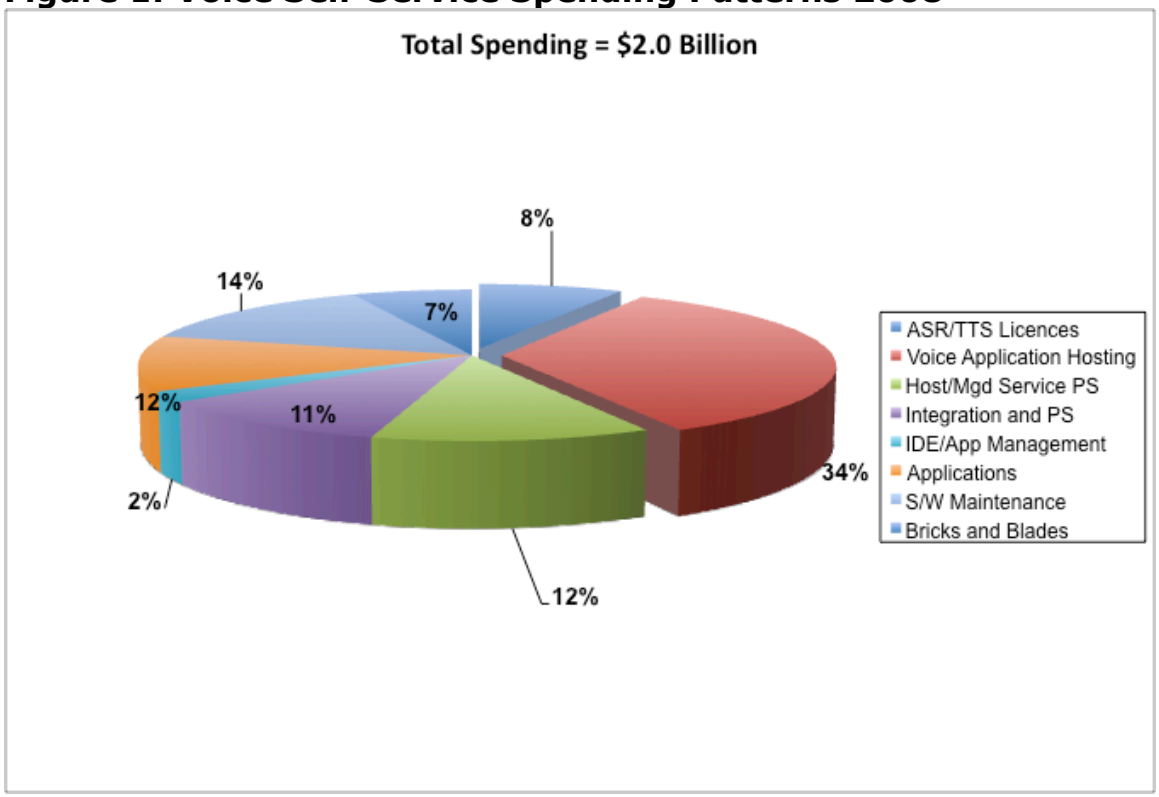
News about enterprise spending on information technology, telephony infrastructure and services is going from bad to worse. This month (April 2009), Gartner revised its spending forecast to show it decreasing at a 3.8% rate. This is a considerable downgrade from the anticipated 2.2% increase in spending it had projected just three months earlier.

In fairness to Gartner, the global economic meltdown, spurred by the collapse of the home mortgage market in the U.S. has had a dramatic ripple effect. What's more, there are counter-cyclical opportunity areas and pockets

of activity where vendors and service providers are experiencing impressive revenue growth (double digits in some cases). We observe that these tend to be service companies that offer ways to extend the life of existing infrastructure or augment the capabilities of existing staff and resources.

The CAT ecosystem, illustrated below, focuses on enterprise spending, primarily on voice. It segregates spending on voice applications from other self-service investments even though the basic tenets of Web 2.0 and beyond encourage reuse of existing code and sharing of core data across many applications and channels. Bear in mind that CRM spending in 2008 per Gartner was $7.8 billion (growing at 14.8%) – including licensing, upgrades, maintenance and support.

Figure 1: Voice Self-Service Spending Patterns 2008

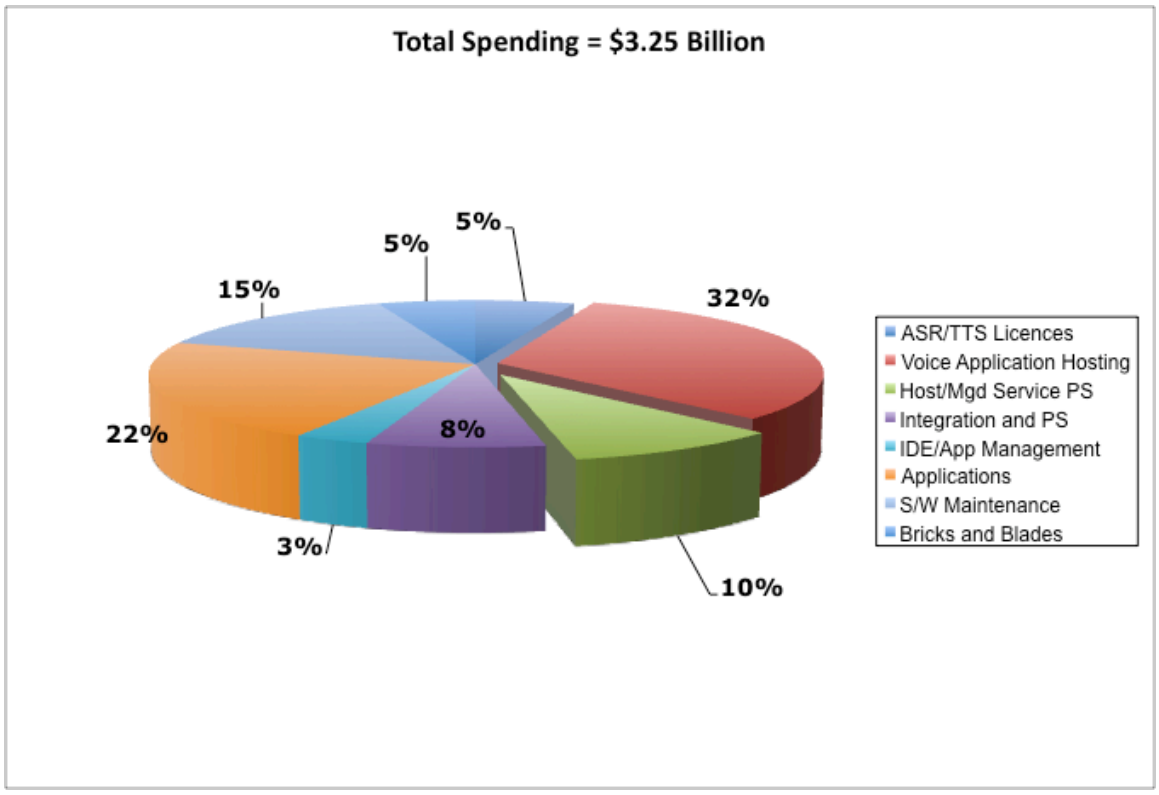


Source: Opus Research, April 2009

In our assessment of enterprise spending in 2008, Opus Research had already observed that spending on conversational access technologies was taking on a Web-like model and migrating to third-party companies that carry out application development and hosting. We continue to use "ports" or "port equivalents" as the key drivers to assess and forecast spending because the terms refer to the capacity to support simultaneous talk paths, which (along with minutes of use on a network) are at the root of current licensing arrangements for call handling, automated speech recognition or text-to-speech conversion resources.

Because the unit of measure has changed significantly, forecasting revenues for voice self-service has become more art than science. The 'street price' – negotiated between software vendors, their go-to-market partners and customers – are a well-kept secret and a moving target, based on means of deployment. One of the leading voice application hosting companies told a group of analysts that almost half the revenues for new accounts was "performance-based."

Figure 2: Voice Self-Service Spending Patterns 2013



Source: Opus Research, April 2009

To be sure, the market is very dynamic and these findings and forecasts are directional in nature. Figure 2 (above), which estimates enterprise spending in 2013, reflects how "core" hardware and software become table stakes for companies to build their self-services infrastructure. Together they will account for about 10% (5% each) of total expenditures in 2013, compared to 15% in 2008 (8% and 7% respectively). At the same time, the combination of resources involved in service delivery (applications, development environments, hosted services and professional services) accounts for 75% of an enterprise's spending. This is down from 80% of the enterprise spend in 2008.

Embedded in our forecasting model is an estimate "price" for each slice of the pie illustrated in Figures 1 and 2, when assessed on a "per port" basis. The growing number of IP-telephony networks for customer care has made these assessments more difficult. The decline in "per port" pricing also reflects the move toward new architectures that allow for license "sharing" among various applications. Therefore, in many cases, this is the "effective price" for each component enabling apples-to-apples comparison, perhaps at the expense of precision, especially in the outer years of the forecast.

Figure 3: Per Port Pricing Assumptions

	2008	2009	2010	2011	2012	2013
ASR	$700	$650	$600	$550	$500	$475
TTS	$225	$200	$175	$175	$150	$145
Bricks & Blades	$500	$500	$400	$400	$350	$350
ASR-related Professional Services	$825	$815	$800	$750	$700	$500
IDE/App Management	$175	$200	$215	$225	$225	$210
Voice Applications	$1,300	$1,000	$1,000	$1,000	$1,000	$1,000
Total Port "Price" (sans mtce)	$3,725	$3,365	$3,190	$3,100	$2,925	$2,680

Source: Opus Research (2009)

The shift toward software and services bodes well for companies on the higher rungs of the solution stack; professional services include development, installation, monitoring, maintenance and hosting of the resources that support phone-based customer care. The perceived value of phone-based solutions have less to do with "speech enablement" and more to do with enabling existing resources in contact centers and data centers to reach people over the phone. In this context, speech is only one of many alternatives for customer interaction.

Vendors Pitch the Virtues of Virtualization

Under present financial conditions, enterprises of all sizes scrutinize both capital budgets and staffing needs. They have, in effect, breathed new life into the market for outsourced services while, at the same time, turning to trusted third parties, such as their telephone companies and system integrators, to take more active roles in service delivery and customer support. Thus, the infrastructure providers who detail the most flexible ways to cost-effectively deliver service are growing their businesses.

Opus Research has long provided a forecast of enterprise spending on hardware, software and services associated with "Conversational Access Technologies." As mentioned, our model has typically been "ports-driven,"

meaning that the core technologies under study are the speech-enabled ports on new or upgraded IVR systems. The advent of VoIP, VoiceXML, "media servers," service-oriented architectures, cloud computing and you-name-it-as-a-service has put strains not only on our forecasting model, but on the systems planning of just about any enterprise of size.

Today's customer care solutions span spoken words (both live and automated) as well as text in the form of email, blogs, instant messages, chat, "tweets" and text messages, as well as the content or copy inside of ecommerce Web sites. In all cases, interactions are supported or orchestrated by logic and business rules residing in the same application and database processors that power a company's presence on the World Wide Web. That's why the attraction of Web 2.0 is predicated on savings that arise from sharing such resources across many applications and corporations.

By comparison, consensus assessment of spending on hardware, software and services to support Web 2.0 applications will exceed $4.5 billion by 2013. This refers to enterprise spending on the tools and resources that support more social computing and communications, including Web mash-ups that create personal portals and the rapidly changing infrastructure that enables both customers and employees to share their opinions, observations, recommendations and the like. In this context, spending on the speech processing and call processing resources to support voice-based interactions will amount to a maximum of one-quarter of the spending on Web 2.0.

Spending on "Pure" Speech Technologies is in Decline

Our forecast shows that core speech processing technologies are of diminishing value as a percentage of spending on "complete solutions." In the world of Web 2.0, much of the call processing, voice processing and application processing horsepower moves into the cloud where it can be shared among multiple users. In the collaborative (or "open") scenario much innovation (and therefore value) is driven by developers. Thus the percentage of spending for development environments and developer hours expands to a certain point enabling them to share the fruits of their labor.

We're at a key transitional stage in the introduction and deployment of Web-driven voice self-service. Vendors fully understand and offer a range of solutions that take advantage of openness, standards and the spirit of collaboration that shapes Web 2.0, but to a large degree they have not made it "simple."

The most noteworthy trends in our assessment of enterprise spending is the rapid relative growth in investment in the tools and run-time environment for applications. Another noteworthy item is how professional services, and hosting and management, are taking over the lions' share of spending for solutions that involve speech ports. This reflects spending strategies that minimize fixed costs (such as permanent payroll) and try to make more of less staff and lower levels of capital spending.

Big Green Captures Big Blue's Source Code

Nuance (Big Green for automated speech aficionados) remains the biggest provider of automated speech processing software and has staked its claim on more of the solutions stack by offering additional professional services, hosting services and a wider range of multi-modal solutions to enable more services to mobile and automotive markets.

Figure 4: Server-Based ASR Vendors

Vendor	Core Product	Comments
IBM	WebSphere Voice Response	IBM's licensing of source code for embedded ViaVoice and WebSphere VR to Nuance could emerge as the biggest change in the history of speech-enabled services.
Loquendo	Loquendo ASR	A major success story globally with U.S. and U.K English, Canadian French, Spanish, (Catalan, Valencian, Colombian) Dutch, French, German, Greek, Italian, Polish, Portuguese, Swedish, Argentinean, Brazilian, Chilean, Mexican, Turkish, Galician and Russian Also supports booth MRCP: v1 (RFC 4463), based on RTSP/RTP, and v2, based on SIP/RTP, enables audio recording and speaker verification.
Lumenvox	Speech Engine	Languages and Features: Mexican and South American Spanish, Canadian French; and U.S., U.K., Australian/NZ English MRCP v1 and v2. W3C's Semantic Inter-presentation for Speech Recognition (SISR - part of VoiceXML 2.0), W3C's Speech Recognition Grammar Specification (SRGS)
Microsoft	SpeechServer integrated with Office Communica-tions Server	Ecosystem partners: include Tellme, Nortel, Enghouse/Syntellect (Envox) Gold Systems, Vail Languages and Features: Canadian French, English (U.S. and U.K.), German, and U.S. Spanish at launch. Not ideal for IVR, better for auto-attendant and voice dialing.
Nuance	Nuance Recognizer v9	Languages and Features: over 44 languages supported. Emphasizes natural language understanding (SpeakFreely) conforming to Natural Language Speech Markup Language (NLSML), Extended Multimodal Annotation (EMMA), SRGS, SISR, and MRCPv2.
Telisma	teliSpeech 1.2	Now owned by OnMobile in India. Ecosystem Partners: Led by Atos, CapGemini/E&Y, NextiraOne, Alcatel/Lucent, NMS, Unisys, Varetis, Genesys, Aumtech, Crealog, HP, Idylic, Netcentrex, Vox Pilot
Voxeo	Prophecy Recognizer	Cost-effective, accurate speech recognition engine embedded in the Prophecy platform.

(Source: Opus Research, Inc. 2009)

A new community of "Web-oriented" developers is constantly on the lookout for lower cost alternatives, especially those more conducive to deployment "in the cloud." One model to highlight is that of Voxeo, which has baked speech recognition and TTS engines into its Prophecy platform. Another approach could be exhibited by the open source-friendly set of developers around the Asterisk platform. They have done creative work with the open source recognizers from CMU Sphinx and text-to-speech software carrying the Cepstral nameplate.

Somewhere in the middle is Microsoft's promise to deliver the capabilities of SpeechServer in a way that is deeply embedded in the Office Communication Server. Because it is inextricably tied to sales of other Microsoft Services, including Exchange, IIS, Active Directory, etc, it is nearly impossible to put a price on a Microsoft branded speech processing as part of a speech-enabled portal or other set of apps.

But this makes for a great transition to the discussion of the structure of the development community. Nuance makes the case that the user experience is paramount and that lack of customer satisfaction has been the result of ill-deployed solutions. They believe that the ultimate "peace of mind offer" for enterprise clients seeking the highest quality VUI comes from working with Nuance's own professional services organization, whose core group joined the company with the Viecore acquisition in 2008.

The Embedded Arena Remains Up For Grabs

On the mobile and automotive side, Nuance has taken a decidedly multi-modal approach both through its acquisitions and its go-to-market strategy. The mission is to embed some flavor of Nuance software to support control, text entry and/or search on the hundreds of millions of so-called feature phones around the world. That places emphasis on accurate recognition of the content and context of utterances, as well as judicious application of "predictive" recognition of input.

The other major set of news surrounding core speech technology is the quiet demotion of speech-enabled platforms within the WebSphere family of middleware and application platforms. Big Blue – which is famous for "doing the numbers" – has clearly concluded that the shortest path to the most revenue arises from licensing access to its speech processing source code to one of its chief competitors. As a result, Nuance will accelerate research & development efforts toward building a broad portfolio of multi-modal applications in part through the integration of IBM's intellectual property.

The "Through the Looking Glass" nature of this deal was dramatized by the speculation surrounding its meaning. Namely, it represents an all-out assault on Microsoft; it signals the imminent acquisition of Nuance by IBM; it shows that IBM is "getting out of the speech business." Nuance's Steve Chambers characterized the acquisition as the product of years of discussions. He

acknowledged much respect for the IBM code and said that a system of governance is in place to bring the technology to market.

IBM is famous for carrying out complex mathematical and financial analysis when evaluating its business options. Selling licenses to Nuance signals that the results of its business calculus show that near-term licensing (even to a competitor like Nuance) will prove more profitable than its own efforts to bring products to market.

Licensing is an important revenue source for IBM and this takes away some uncertainty surrounding revenue capture. It also means that Nuance is likely to be the company that brings the best of IBM's speech processing technology to market for enterprise, contact center and embedded implementations. IBM's decision to cash in on some of its speech processing technology investment signals that some of its financial analysts have concluded that there was no better time to sell core technologies. It should be taken as a sign of the price they believe the market is willing to pay for finished products and is not destined to justify its long-standing investment.

Nuance fully expects to justify its investment in IBM's source code by integrating it into a broad range of products. This is very important because it has attached a high premium on bringing highly accurate speech processing resources across a broad variety of delivery modalities. Its engineers are well-acquainted with the strengths and weaknesses of IBM's technologies and how it can be incorporated into Nuance solutions.

Nuance has dominant share of the installed base of voice-enabled telephony ports, as well as embedded speech processing resources. However, it is not a monopoly situation. Even if IBM's presence is added to Nuance's (which IBM emphatically denies will happen), Loquendo, Lumenvox, Temeq, Telisma, IFlyTeq and many others have found product niches. On the embedded side, Sensory, IBM and Fonix round out the roster that includes Nuance.

Disaggregated Development Environments

For years, Opus Research has attached a monetary value to a set of software and tools designed to support rapid development and deployment of voice self-service applications, commonly referred to as "integrated development environments" (IDEs). There remain a few providers of development platforms, Vicorp and Nu Echo come to mind. But many of the firms, exemplified by Audium, VoiceObjects and Fluency have been "integrated" into acquiring firms (Cisco, Voxeo and Syntellect, respectively).

Developing elegant code for voice user interfaces (VUIs) and callflows has always been a highly personal, almost artistic, endeavor. Its practitioners have had a way of defining which tools they prefer to use. It has been historically difficult to nudge them away from their current solution. This situation has been compounded in the past year by successful efforts to

recruit interest from Web 2.0 developers to extend access to their applications over the phone.

So it is that, under the new market regime, IDEs closely mated to voice self-service platforms are being replaced by "disaggregated development environments" (DDEs) which give developers the power to use the tools with which they are most familiar and comfortable. Some people like to code in familiar computer programming languages, others like to use code generators that start with Visio-like pictures, flow charts and pull-down menus with re-usable elements. Technology trends promote choice.

In the long run, it will be the re-combination of disaggregated parts that will define Web 2.0 supportive platforms. In the early years of our forecast, it is the role of third-party integrators, managed service providers and hosted service providers to build solutions, often on a time-and-materials basis. Companies like Gold Systems, PSS (Product Support Solutions), Contact Solutions and a handful of other IVR applications specialists report impressive growth in the past year, in spite of (or perhaps because of) the financial strains that a poor economy puts on many companies.

Yet we're already witnessing initiatives from the likes of Tuvox, Voxify, SpeechCycle and other firms that play up the prospects for 'deep' integration of speech processing and application logic and business rules over broadband, IP-based networks. With the addition of algorithms that promote rapid recognition of the context of a call and, thus, more accurate "understanding" of the call's purpose, the developer community is starting to deliver on the promise of extending Web-like self-service over voice-based channels. Ultimately, calls will be answered by automated resources which perform "triage" by identifying the caller, assessing the purpose of the call and determining how best to fulfill the caller's requirements. In some cases, the calls will be fully automated. In others, the platform will determine where best to route the call based on business rules and application logic that evolves over times.

Automated Speech Platforms Pick their Spots

The historic centerpiece for this series of reports was "The Voice Application Ecosystem." The name reflected Opus Research's fundamental area of investigation and analysis as well a core belief that the market found value in "speech-enabling" interactive voice applications. We found roughly 100 firms were engaged in the process of bringing speech recognition resources to bear and convert touch-tone based IVR applications into ones that would respond to spoken words.

Accurate, speaker-independent speech recognition for command, control, search and transcription is becoming a vital element to some fast-growing phone-based applications. In addition text-to-speech (TTS) conversion is at the heart of hands-free "reading" of directions from automotive navigational systems. Success breeds success and the incorporation of speech

technologies in products from Nuvi, Nokia, Garmin and many others is conditioning the market for further adoption.

Figure 5: Platform Providers' Web 2.0 Strategies

Vendor	Product	Comments/ASR Partners
Aspect Software	Customer Self-Service Unified IP (formerly Ensemble Pro)	Microsoft and Nuance VoiceXML Studio/3rd Party Tools Aspect remarkets Tellme-based applications as a hosted alternative.
Avaya	Voice Portal Interactive Response Conversant (legacy) The Aura Architecture	Nuance, IBM Dialog Designer (VoiceXML 2.0) Script Builder Aura includes a "Session Manager" to support multimodal and multimedia applications
Cisco Systems	Customer Voice Portal IP-IVR	Nuance and MRCP conformant (Telisma, Loquendo, IBM) GVP Studio (formerly Audium)
Genesys Labs	Genesys Voice Platform 8.0	Nuance, IBM Merges Genesys Voice Portal and VoiceGenie into a single platform
Holly Connects	Holly Voice Platform	Nuance, IBM, Lumenvox Vicorp xMP, Audium VoiceObjects, IBM WebSphere Studio
IBM	WebSphere Voice Server	IBM WebSphere Voice Toolkit, 3rd Party: Audium (Cisco), VoiceObjects
Interactive Intelligence	Vocalité (may be re-branded)	Nuance Homegrown, (not VoiceXML)
Convergys/ Intervoice	Media Exchange Electronic Voice Interaction Platform (EVIP)	Nuance, Microsoft InVision Studio (graphical VoiceXML user interface designer)
Nortel	MPS 3.0	Nuance, Quantum, Loquendo also working with Microsoft OCS Audium (Cisco), Vicorp, IBM

Syntellect	Continuum Self Service (formerly VISTA)	Nuance Audium (Cisco) Assimilating Envox and continuing to acquire companies like Trio
Voxeo	Prophecy	Prophecy as well as Nuance and some Microsoft Deployed either on-premises or hosted/ Voxeo Designer, Tropo.com or XML-based telephony

(Source: Opus Research, Inc. 2009)

Noteworthy initiatives among platform providers include:

- **Avaya's Aura architecture** – An approach that enables Avaya customers to build "enterprise clouds" where distributed components including a branded IMS platform operate under the control of a centralized Session Manager.
- **Genesys steps up "cross-channel conversations" (CCC)** – A new CCC approach is fostered in partnership with InQuira.
- **Nuance emphasizes "proactive outbound"** – As a prototype for highly flexible, customizable service, Nuance delivers responds to the market need for opt-in, outbound services.
- **Voxeo provides multiple approaches to development on its Prophecy Cloud** – With the introduction of Tropo.com and the acquisition of VoiceObjects, Voxeo, which relies 100% on third-party developers to bring solutions to market keeps expanding the range of tools and APIs it puts in their hands.

Application Specialists: The Value Creators

Insofar as a "platform" can be the stage on which a performance can play out, the real actors in the coming years operate at the application layer. This year, enterprise customers are starting to understand the value of offerings from voice application specialists like Tuvox, Voxify and SpeechCycle. At the same time, a new generation of multi-modal application developers - IfByPhone, AdHearsion, Jaduka and others – have entered the stage following the bright light of Web Services, "cloud computing" and ubiquitous e-commerce.

The Web has made self-service the norm on the Internet, and speech is definitely *not* always the preferred way to for customers to interact with self service resources. Companies communicate with their customers and those customers, in turn, converse with other customers through text messages, emails, instant messaging and Twitter tweets.

In the best cases, phone calls come into play within the broader context of multi-channel customer care interactions. They may be initiated by a

company as part of an outbound campaign with existing customers, as reminders, notifications or alerts. In return, a phone call may be the preferred mode of communications for real-time conversation and advice. This is most often true for "considered purchases" such as clothing, consumer electronics, travel packages, entertainment venues, automobiles and a multiplicity of services.

Confusion has been compounded in the past year by bad economic conditions. Capital spending has almost come to a halt. Staff cuts in the IT departments made the official demise of the Telecom Manager and, in many cases, led to the departure of the staff of professionals familiar with what it takes to develop, monitor, maintain and refine phone-based applications.

Planning for the Present

As mentioned earlier, forecasts for enterprise infrastructure spending are expected to decline by 2% or even less this year. Yet we're seeing growth rates in excess of 20% for firms (admittedly small). Pockets of heightened spending are with money-saving technologies and services. Well, that's not entirely accurate: countercyclical, less expensive and less risky investment is the mode. And companies and their infrastructure providers who do a better job of riding the Web 2.0 trends will find even more success.

Success among professional service providers keys off of enterprise efforts to control operating expenses without compromising service quality. Upgrading an IVR may not be in the company's critical planning path, but they may turn to one of a number of companies with deep knowledge to help extend the life of existing call processing or speech processing resources. In North America, companies like Gold Systems, PSS or Contact Solutions have reported impressive growth in revenues. Throughout the world there is a growing number of "integrators" who are adding programs that take on management of customer-facing resources, including contact centers, IVRs and remote agents.

E-Commerce With a Human Voice

In this report, Opus Research lays the foundation for understanding, quantifying and reinforcing a fast-growing phenomenon – support of decidedly Web 2.0-oriented activities over the telephone. In a companion document on the topic of "Recombinant Telephony," we will address how the largely disaggregated technology infrastructure and service delivery ecosystem is being reassembled in ways that benefit developers, their customers (enterprises) and their customers' customers (meaning the "general public").

It can be seen as "phone-based commerce carried out in conjunction with the rapid growth and adoption of mobile technologies and social software." But "phones" are changing into mobile devices for access to Web services. "Web services" are taking on more voice applications and those applications are all

"social" in nature. Thus, today's shoppers "go to market" armed with ways to access more people and information than ever before to help them discover and select the goods and services they want to buy, as well as the merchants, service providers or other individuals with whom they want to forge long-term relationships or just do business.

Since the dynamics of "going to the market" have changed dramatically and fundamentally, enterprise marketers have had to be equally dynamic in how they invest in technologies that leverage existing customer care resources (primarily IVR systems, contact center agents and Web sites) and augment them with distributed IT and communications systems that support everything from remote agents to the more freewheeling network of online "guides" and recommenders.

Promoting Seamless Interactions

Web sites offer options like "live chat" with contact center agents to answer those immediate questions. For more sophisticated visitors whose PCs are equipped with softphones or IM agents that support voice or video sessions, they can initiate contemporaneous conversations. Awareness or use of IM or chat clients in a customer care Web site raises expectations for similar responsiveness from phone-based systems. Thus IVRs with limited menus are destined to FAIL. That used to mean that callers "zeroed out" to live agents in contact centers.

Why stop there? Visitors to Amazon.com's Web site over time have seen it evolve from an online store for books to a shopping engine that supports search and discovery, comparison and selection, advice and counsel, suggestions and recommendations and simplified checkout. In a classic case of New Age transformation, Amazon has built a $150 million+ revenue stream out of its "Web Services" operations, which, in its words, "provides access to technology infrastructure that developers can use to enable virtually any type of business." This has inspired a start-up called Twilio to build an API to Amazon.com that uses its application and media servers to provide voice and multi-modal self-service applications.

Amazon's participation in the world of phone-based commerce is a sign of the emerging times. It is aiding and abetting efforts to bring more Web developers into the Voice Application domain and has demonstrably shortened the time it takes to develop and deliver new services that extend the reach of traditional Web sites and Web-based resources (like the checkout). This greatly changes the competitive landscape for old-guard providers of both premises-based and hosted speech application services. These changes are taking place in ways that benefit enterprises in almost every vertical, as well as their customers, and will continue to fuel spending on development of innovative, multichannel services.

