



**Leverage conversational access  
solutions to transform your  
contact center**

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### Introduction

Today’s contact center has become a stronghold of customer relationship management (CRM). And in an information-rich environment, major advances in speech technologies can deliver enhanced access to knowledge for all stakeholders—remote employees, business partners and customers. As more companies adopt the e-business on demand™ model for their strategic IT plans, conversational-access solutions become increasingly critical components of their infrastructures.

In this context, the customer-care experience becomes an increasingly significant competitive differentiator. Not only can the quality of a consumer’s first experience with a given sales channel impact a buying decision; every post-purchase interaction can either strengthen or erode brand loyalty. Marketing executives have to juggle several challenges. Develop more effective customer-care programs. Reduce company operating costs. Enhance the value of the company brand. And accomplish all this at the same time. CIOs are under pressure to adopt and use the newest technologies to reduce costs, and at the same time, drive increased customer-service value. And customers want access to information when they want it, wherever they want it. All part of conducting business in an on demand world.

Consider the demands of today’s marketplace. To compete effectively, you must:

- *Manage the cost of care. The cost of acquiring and serving customers is on the rise, affecting the overall economics of customer service. While the costs associated with rendering care need to be aggressively managed, many organizations are underinvested in strategic care programs that would enhance revenue opportunities and improve relationships with valued customers.*
- *Enhance the customer experience. Customers are harder to impress today. They have higher expectations for efficiency and quality of customer service. With more choices in product types, delivery, channels and pricing, brand loyalty continues to erode. As customers become more mobile, market-savvy and informed, senior executives must drive greater value through service to meet a more demanding market.*

- *Exploit a variety of channels for revenue opportunities. Today, companies sell and support products through a variety of channels, including self-service. Increasingly, they depend on contact centers to raise brand loyalty, improve retention and generate revenue. In many enterprises, the contact center is shifting from being a cost-focused to a profit-focused operation.*

As a marketing executive, your challenges are to develop new care programs, while improving customer service in your current channels – as you simultaneously reduce the average *cost per touch*. As a CIO, your important challenge is to maintain a robust, flexible infrastructure to enable your organization to react quickly to changing market demands. Just as important, you have to manage your company's established heterogeneous environment, control your total cost of ownership (TCO), adopt standards across the enterprise and, perhaps hardest of all, make everything work together.

This white paper focuses on how you can create this environment through the use of conversational-access systems, as IBM brings innovative technologies, such as speech and natural-language conversation to mainstream computing. Although the contact center may be a key channel of service, this paper is about more than contact-center automation. IBM believes that a review of a company's contact-center systems is the place to begin its business transformation. This approach is validated by companies already using conversational access to their vast stores of information as a way to increase customer satisfaction, improve productivity and reduce costs.

More specifically, this white paper:

- *Highlights factors prompting companies to rethink their customer-service operations.*
- *Describes e-business on demand in the context of customer-service processes and systems.*
- *Provides pointers to critical success factors for becoming an on demand enterprise.*
- *Outlines ways to drive improved performance in the contact center.*

***NewportWorks, based in Irvine, California, develops, markets and hosts mobile information solutions both for real-estate enterprises and telecommunications carriers. NewportWorks needed a tool that would allow residential real-estate agents to close new business while on the road, without returning to the office. The solution — based on IBM WebSphere® Voice Server and anytime Multiple Listing Service (MLS) — uses a voice interface to request and retrieve information through mobile phones. Ken Stockman, CEO at NewportWorks, believes that the real-estate industry is ready for anytime MLS. “This product extends the real-estate office into the field,” he says. “We remove pain and add value for real-estate professionals by closing the communications gap with their customers. Now that relationship is extended to virtually anytime, anyplace.”***

- *Describes important new technologies that are revolutionizing customer-service practices.*
- *Offers a roadmap on where speech technology is heading.*
- *Offers advice about next steps to any enterprise currently reassessing its customer-service strategy, particularly its telephone-service channel strategy.*

Current market forces require companies not only to think about the right channel for care, but also to develop processes that permit them to rechannel care as customer needs and competitive pressures dictate. The dynamics of channeling and rechanneling customer care demand business processes that are both flexible and componentized.

Because markets and technologies are continually changing, rechanneling care is not a one-time event. You need to continually evaluate strategies, watch for new opportunities and select programs that can help your organization be cost-competitive today – and in the future.

### **The on demand operating environment — a roadmap to responsive customer service**

Much has been written about what it means to be an on demand business. IBM believes an on demand business is an enterprise whose business processes – integrated end to end across the company and with key customers, partners and suppliers – can quickly respond to virtually any customer demand, market opportunity or external threat. But how do *you* make this a reality for *your* business? Part of the *how* has to do with changing business processes themselves – identifying areas of differentiation where you can reduce costs, create growth or both. Then, figuring out how to adapt business processes and your underlying systems infrastructure. IBM has been working side by side with leading companies to help them realize this concept. As a result, IBM has gained leading-edge expertise that you can leverage to build an IT infrastructure that truly enables – rather than inhibits – on demand business.

One of the key attributes of this operating environment is access. Access to the wide array of back-office databases and customer files that populate the data center.

This infrastructure, or *on demand operating environment*, must leverage existing assets. Because very few information systems (IS) executives, like you, have the luxury of starting from scratch, you need a disciplined approach to evolve from what you have, into what you need. An on demand operating environment also has to simplify the integration process. For example, shifting from a product- or channel-centric business model to a customer-centric business model requires that your customer-service business processes be horizontal, rather than channel-centric. Instead of a different system for Internet customer service, branch customer service and contact-center customer service, you need a single, integrated system, where information can be entered once and made available to all your contact channels. To support these horizontal processes, you need to focus on overall flexibility. To take elements of processes that weren't originally built to work together and connect them seamlessly and – just as important – quickly.

The design of an on demand operating environment should match the design of your business itself. To achieve more flexibility and componentization in your business design, your infrastructure must evolve from silos of complex, often proprietary, hardware and software running isolated systems, to a standards-based infrastructure that enables you to optimize and reuse core systems components across your entire organization. If, for example, your customer wants self-service access to information or transactions, gaining access to that data should be consistent. Back-end processes should be transparent to the customer. Whether that individual is choosing to engage in conversational self-service over a telephone that uses speech-recognition technology, or Internet self-service through your Web site.

### **Integrating customer-service systems across channels — what's involved?**

To operate a customer-centric business model that reflects changing business circumstances and customer needs requires solutions and thinking that can quickly and easily enable the adoption of new or modified processes, new business rules or policies, and new marketing campaigns and workflows. These solutions and thought processes must apply to all appropriate applications across the enterprise and to all channels of customer contact. Part of the challenge is to create a single view of your customer – particularly when your

customer information may reside in database silos, which have proliferated around tactical, heterogeneous channel implementations over the years. This business-critical information resides in mainframes, in contact-center distributed databases, in Web-channel databases, on advisors' laptops, in marketing and corporate data warehouses, and in branch filing cabinets. To handle these disparate resources, you need an infrastructure that combines the elements essential to a multichannel, integrated solution. To develop your long-term integrated channel strategy, your infrastructure should include:

- *The development of a common, open-standards-based architecture that permits channels to work in concert within a multichannel framework*
- *The creation of a single control point to unify disparate customer and product databases across multiple channels – improving customer-service consistency and enabling cross-selling across channels, when appropriate*

The cornerstone of any multichannel architecture is the middle-tier integration layer, which might include:

- *An application-server platform, to provide the deployment environment for Internet-enabled applications within a multitier architecture.*
- *A common services layer implemented generically across all channels and comprising product- and channel-agnostic functions, such as security, logging, session management and host integration. This layer eliminates the need to develop these services for each channel separately, decreasing the complexity of new channel application development, improving time to market and promoting component reuse.*
- *A business components layer, which, in contrast to the common services layer, will remain largely channel specific. However, a key benefit of a standards-based architecture is that it enables business components to be built once and reused across channels. This helps reduce application-development costs because fewer resources need to be dedicated to these tasks. And an orchestration engine or modeling tool gives business users the control and flexibility to change business processes as needed.*
- *Presentation layers that remain individual to each channel, so you can format the data to accommodate different channel interfaces.*
- *An enterprise application integration layer and business process management layer to act as a wrap around the multitude of disparate product systems at the back end and enable integration with the channel application platform.*

***U.K. company Dial-a-Phone, a market-leading supplier of mobile phones, operates without retail store outlets. Much of its business is transacted by phone, so the company's business success meant an increasing contact-center workload. Dial-a-Phone chose IBM WebSphere Voice Server and IBM WebSphere Voice Response software — and IBM Business Partner Digital Union — to help it partially automate its customer interactions. Simple prompts take customers into a system that recognizes spoken post codes and other personal information, as part of obligatory data checks. Then the call is passed to an appropriate agent. The new system has resulted in an agent-handling time reduction of more than 20 seconds per call, on calls that previously averaged 3 minutes. And Dial-a-Phone has also realized an overall 10 percent cost savings — simply by automating a standard step in the customer-handling process.***

While allowing channels to work in conjunction with one another, the architecture just outlined also offers the additional benefit of overall lower cost of ownership, because fewer staff are required to support it, and implementation, maintenance and upgrade costs can be significantly reduced.

Return on investment (ROI) cases for automation of customer-service processes that leverage speech-recognition technology can be significant. Open standards are critical to driving these cost savings. If your enterprise already considers today's multichannel environment challenging for your IS department to support, consider the likelihood (if not the certainty) that customers will seek to interact with their preferred service or product suppliers using a plethora of new, intelligent mobile devices. So, the integration challenge is multiplied — unless your organization adopts a clear policy to adhere to open standards. And unless well-architected middleware, such as WebSphere software from IBM, is in place to help ensure that issues — such as connectivity, presentation management by device and application integration — are all handled smoothly.

In the longer term, you can expect to hear more and more about on demand access. IBM Pervasive Computing software products — of which WebSphere Voice products are a subset — extend access to information and transactions to many classes of devices, including ordinary wired phones. More than two billion (U.S.) phones, fixed and mobile, are now enabled as client devices, because companies are leveraging the power of pervasive computing technology from IBM.

### **Full or partial self-service**

To combine self-service and traditional contact-center components requires a clear definition of the call-flow process (as shown in Figure 1), so that all interactions work seamlessly. The solution should incorporate built-in contingency plans that connect customers with a live agent as soon as additional assistance is necessary. Savvy companies achieve the best of both worlds, combining technology innovation with sophisticated business processes to enhance the customer experience, while reducing the overall cost of customer care.

Reducing the unit cost of customer interaction is a complex process that involves weighing the pros and cons of numerous interconnected variables. IBM experience shows that companies should approach the process using rigorous, quantitatively driven analysis to frame the issues and opportunities. This method helps companies make the optimum choices to drive down costs, and to shift investments to the strategic dimensions of the customer-care program.

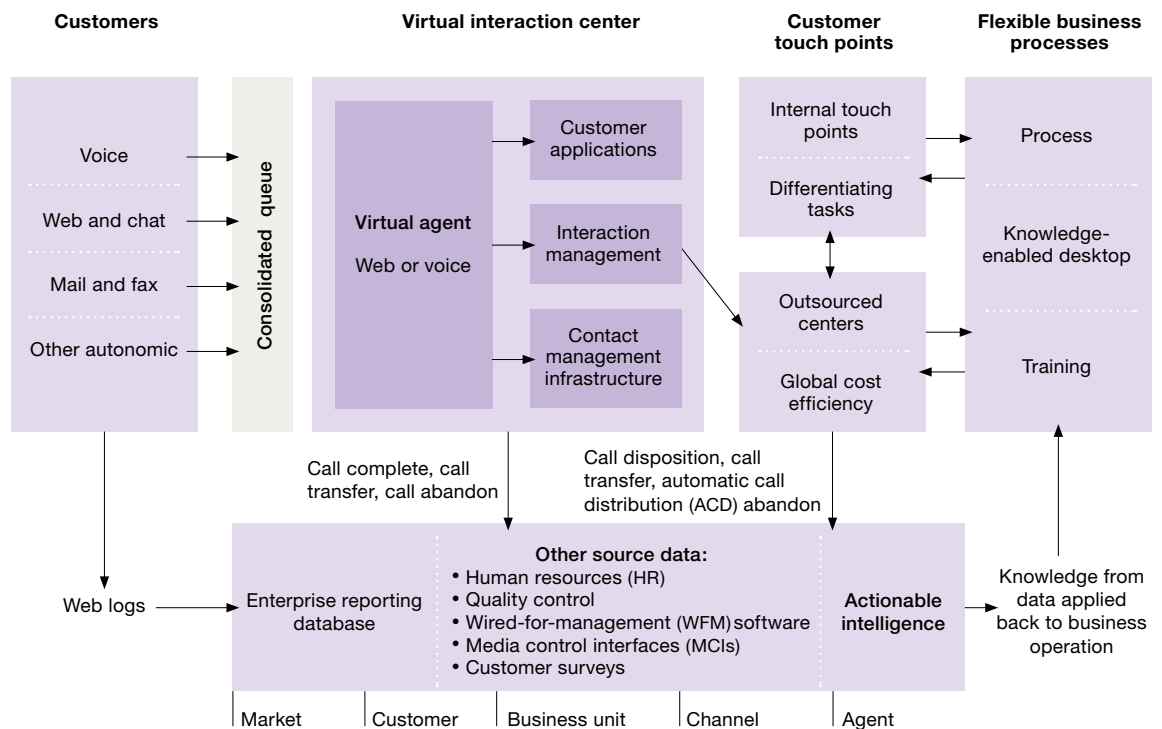


Figure 1. IBM can help you transform your customer-care environment, migrating customer touch points to self-service, based on IBM's unique business architectures and industry-specific processes.

**Capitalizing on technological breakthroughs**

The ability to react quickly to market demands and competitive threats requires highly evolved technologies that can provide real value to your on demand operating environment. Speech is one of these technologies. Through more than 30 years of research and development at IBM, speech technology has reached a level of sophistication that can make it a valuable business asset.



Figure 2 depicts a timeline that maps the milestones of speech-related technology development against interaction types. More than 200 IBM voice-system patents and numerous advancements have contributed to the creation of systems that manage increasingly complex interactions with people. In the 1970s and 1980s, most speech technologies were concentrated on routing calls through interactive voice response (IVR) systems, handling simple inquiries and generally yielding very low customer-satisfaction results. More recently, impressive advancements in conversational applications support the deployment of sophisticated and engaging *personas* on IVR systems – capable of handling more complex transactions and improving the customer experience in the process. As a result, conversational self-service applications have moved from the research lab to the IT center as valued solutions.

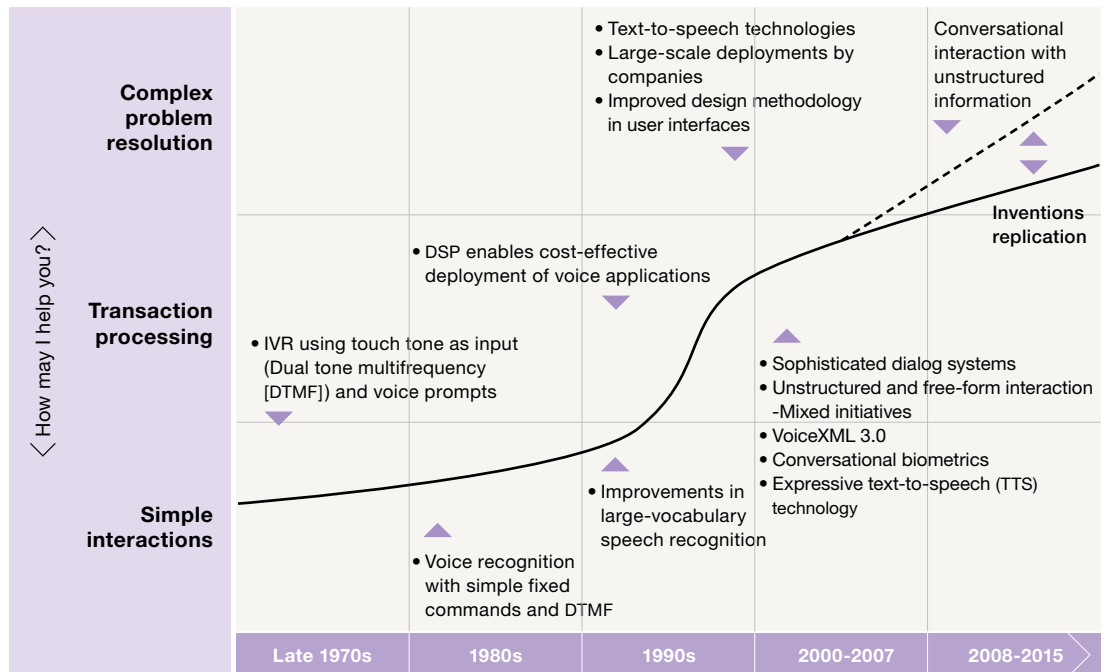


Figure 2. Advances in conversational technologies are accelerating and present new opportunities to improve customer care.

IBM continues to invest significant research and development time – and to apply its broad experience – to develop and refine processes, methods and technologies in speech applications. Ultimately, the voice is the most natural and standard interface for communication. And, in a global economy, voice applications represent a powerful medium for improving the dynamics in channeling care.

**Open standards create a paradigm shift**

In 2003, the industry saw a major shift in the way conversational applications were deployed with the broad acceptance of VoiceXML. The effect was to separate the business logic from the user interface, creating an environment that lets you leverage and reuse back-end processes across multiple modalities (see Figure 3).

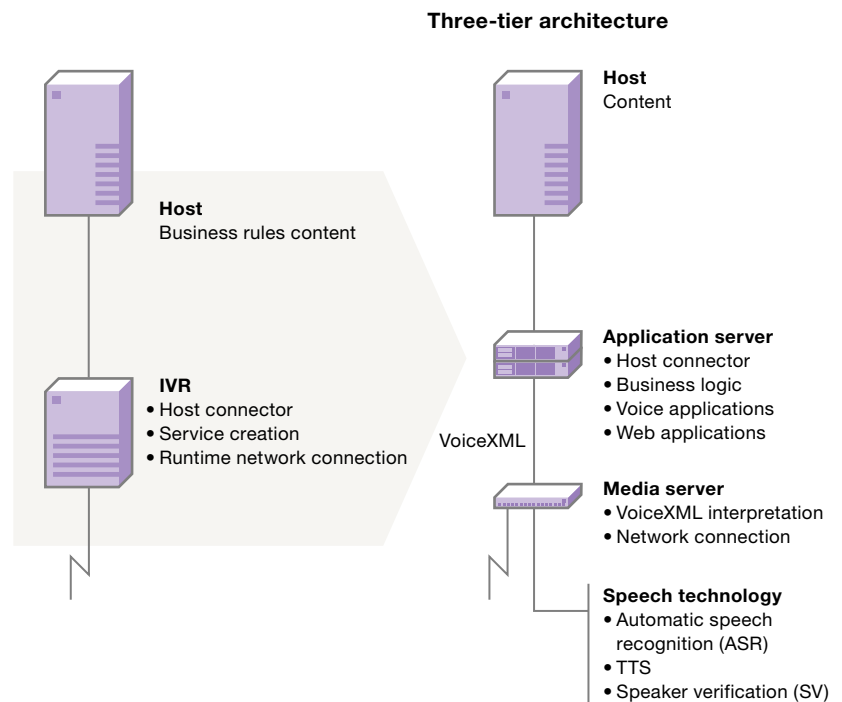


Figure 3. Broad acceptance of VoiceXML has had a dramatic effect on the contact-center industry by moving business logic from monolithic IVR systems to Web application servers.

VoiceXML can dramatically reduce the time and cost to deploy new conversational solutions. IBM has augmented these benefits by creating graphical tools built on the open-standard-based Eclipse framework. Using these advanced VoiceXML-generating tools, developers can visually map out call flows of their applications.

### **Conversational solutions become mainstream**

Speech technology has gone through all the phases of a startup. As it has moved from lab experiments, to a few good deployments, to maturity, speech technology is now making a significant impact on state-of-the-art contact centers. Today, companies across many industries – including banking, insurance, utilities, telecommunications, retail, travel and transportation, and healthcare – use IBM’s telephone speech product, WebSphere Voice Server. Speech technology, like WebSphere Voice Server, generates greater customer satisfaction, customer retention and additional revenue streams, and offers a range of sophisticated features.

### ***Natural language understanding capabilities***

Teams within IBM Research have made tremendous progress in natural language understanding (NLU), the study of spoken-word recognition and unstructured dialog interactions. IBM has successfully deployed NLU-based conversational solutions with very positive end-user reaction. The most common use of NLU today is for call-routing systems that use the opening dialog “How can I help you?” These systems use NLU to parse users’ utterances, transferring the calls to the right person or conversational application. So, for example, the customer can say “I want to pay my bill,” and be routed to a bill-payment application. More-sophisticated NLU applications help you complete a broad set of transactions, such as buying or selling mutual funds through a conversational interface.

### ***Customization***

Customers expect to be able to personalize their experiences when they're interacting with a conversational interface with multiple applications. And contact-center managers expect to be able to add and delete services without having to rewrite entire applications. Voice portal technology lets you provide authentication, customization and subscription services. Using the portlet architecture of IBM WebSphere Portal, IBM WebSphere Voice Application Access extends the flexibility of the portal environment to conversational self-service.

### ***Conversational biometrics***

Conversational biometrics enhance user identification by combining speech biometrics (the voiceprint) and user knowledge (such as passwords and personal information) for verification. Having two information sources increases security and reliability, and provides a flexible framework for various authentication scenarios to maximize user convenience. Technologies that enable conversational biometrics include acoustic speaker recognition, speech recognition, NLU and dialog management. The verification system consists of one or several short interviews involving random authentication questions and an acoustic voiceprint check. The length of a session depends on the validity of the answers the caller provides and the confidence level with which the speaker's voice matches the voiceprint on file.

On the forefront of research in this area, IBM holds a number of patents in conversational biometrics. Going forward, the research focus is expected to be on improving accuracy and robustness against channel mismatch and noise, accelerating algorithmic processing to enable faster search, improving real-time speaker identification and developing new tools for designing verification policies.

### **Recommended next steps**

If you want to transform your customer-service strategy, consider the following questions:

- *Can my company describe its desired strategy for customer service across the enterprise?*
- *Will the strategy significantly differentiate my company through innovative customer-care programs?*

- *Will the strategy reduce my company's cost of customer care without degrading service quality?*
- *Will the strategy improve flexibility to manage customer interactions in multiple channels and touch points?*
- *Does my company's service strategy leverage technology appropriately?*

And, specific to the contact-center operation, these questions are important:

- *Are there interactions in my company now using contact-center agents that have no clear added value compared with the possible self-service automation of that same task?*
- *Are my company's contact-center agents' talents being maximized, or is too much of the caller contact work tedious in nature?*
- *Is my company able to adequately assess these factors by internal review, or would external assistance be beneficial?*
- *Are my company's channel integration strategy and roadmap to an on demand operating environment clearly defined, or could it benefit from some experienced assistance?*

The IBM Pervasive Computing organization has developed a portfolio of products that can help move your organization towards an on demand operating environment with specific speech- and device-related middleware.

- *WebSphere Voice Server provides the ability to turn spoken utterances into an understanding, which can then be acted on by self-service applications.*
- *WebSphere Voice Application Access extends WebSphere Portal to include voice access to all applications and data that are aggregated through the portal. Using WebSphere Voice Application Access can significantly reduce the time to market for conversational applications by supplying necessary attributes such as single sign-on, authentication and aggregation.*
- *Voice Toolkit for IBM WebSphere Studio Site Developer provides a GUI for developing VoiceXML applications, using the Eclipse framework already familiar to many developers.*

Besides providing software products, IBM has recognized expertise in consulting and implementation services for customer relationship management. IBM Pervasive Computing and IBM Global Services are dedicated to helping you realize the vision of e-business on demand. And to helping you accomplish these goals while driving down costs and maximizing the use of legacy assets. IBM middleware products, its portfolio of voice solutions and its people are focused on making your operations more competitive and cost-effective.

**For more information**

To learn more about IBM Pervasive Computing conversational solutions, contact your IBM sales representative or visit:

**ibm.com**/software/pervasive



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