HOW TO BUILD A SUCCESSFUL SPEECH APPLICATION

A STEP-BY-STEP INTRODUCTION
TO MAKING SPEECH WORK FOR YOU

Dear Reader,

Designing and implementing an over-the-telephone speech recognition solution may seem like a daunting task. But it won't be if you have the right company supporting your team.

Our company offers world class technology and is committed to bringing speech applications to market in the quickest, most cost-effective manner.

Our SpeechWorks™ recognition engine provides industry-leading accuracy employing both natural language processing and speaker independence to allow caller interaction in the most natural way possible. It is also the most efficient, providing superior price-performance and unsurpassed scalability on industry-standard, open systems.

We pioneered the "building block" approach to speech application development with patent-pending DialogModules™ that can be configured swiftly and easily. One way to get started is by taking advantage of our Rapid Prototyping Center, an environment where we help you structure a speech user interface, prove your assumptions, and equally important, demonstrate the approach to management.

*An iterative process of testing and tuning is of paramount importance in the development of speech applications that really work to expand the reach of customer service and save you money. The following pages introduce the proven process we've developed and used with great success at Bell South, E*TRADE, United Airlines and other companies. We've noted ten steps and you've already taken the most important one by reading this guide.*

Sincerely,

Mark A. Holthouse
Senior Vice President, Operations

((1)) Understand Your Goals (Why Speech?)

An effective speech deployment starts by setting clear objectives. What do you want speech recognition to do for your call center or your business? A speech-enabled application can accomplish many things; what goal is most important to you?

Speech can help you keep costs low and productivity high. It allows you to minimize the addition of call center personnel, while expanding customer contact. Speech makes possible new channels for automated transactions and e-commerce, 24-hours a day. And in a world where success increasingly hinges on the quality of customer service, speech provides fast and friendly solutions that differentiate you from the competition. Defining your goals in advance will help you make the right "how to" decisions as you move forward.

((2)) Answer the Question: "What do callers really want?"

Touchtone IVR applications were very effective in reducing call center costs. But the service they provided was often frustrating to end users, resulting in the all-too-frequent "bail-outs" to agents who offered a friendlier voice. Don't make the same mistakes.

Step back and think about your callers. Why are they using the phone in the first place? What would they really like to accomplish when they call? The answers are not always obvious. Most people call with a specific objective, but also have other important considerations. Travelers might want to purchase tickets, but also want to know that they're getting the best fare, and a direct route. Thinking about these issues early in the process will help you build prompts and responses that address callers' concerns.

A SpeechWorks travel customer includes information on premium seat availability when providing callers with flight options.

Consider your different groups of users. How will novice users differ from experienced ones? Will small business customers use the system differently than consumers?

((3)) Plan for a Seamless Customer Experience

Speech can augment the self-service systems you already have in place,

or provide entirely new channels for information and e-commerce. Evaluate your current system components and decide how speech should best be integrated to meet your company's and your callers' objectives.

One SpeechWorks customer has expanded its market by complementing its Internet-based investing service with speech-activated quotes and trading available by phone, anytime and anywhere.

For example, should a speech-enabled application be used to complete a transaction, or simply to provide information in the form of a "screen pop" to agents? Should touchtone be discontinued entirely, or made available on demand for actions like entering a password, which callers may not wish to speak aloud? Most important, how can speech complement current and future Internet-based services – delivering the same types of interactive applications – without requiring a browser?

((4)) Let Your Personality Shine Through

Now it's time to have some fun! Think about how callers can interact with your new speech applications. Think about the different ways that people express what they want, and how your system can respond. To start, consider some basic design principles.

Set a Voice and Style All Your Own

Establish a "personality" for your speech-enabled application. This will come through in the selected voice you choose for your recordings and in the formality of the prompts you create. Consider your objectives and your market. A brokerage firm, for instance, may want to project an image of security, strength and know-how. A cruise line, on the other hand, may choose to stress value or pleasure.

Offer Multiple Navigation Options

Be sure to accommodate both experienced and novice users. Whereas the first-time user may need to listen to every prompt and follow step-by-step instructions ("directed dialogue"), the experienced user may wish to interrupt prompts ("barge-in") and speak in complete sentences ("natural language"). It's helpful to guide your callers in the use of natural language short-cuts by prompting with hints such as, "Next time, you can just say 'I want to fly to Washington, D.C. this Thursday in the morning.'"

Be Friendly

Use polite, conversational phrases such as "I'm sorry, I didn't understand that," as compared to the more technical "that was an invalid entry." In short, don't make your callers feel stupid or uncomfortable because they're unsure of what they are expected to say.

■■■ **CHECKPOINT: Write a requirements document based on steps 1-4 above.**

((5)) Create Your Call Flow

Call flow is the map or model of how callers will navigate through an automated system to reach their goals. Start by establishing common questions and their common answers. Initially, this takes the form of a directed dialogue. Later, natural language shortcuts may be worked in to give experienced users quicker ways to interact.

Once you understand the call flow, you can start to draft your caller prompts. With first drafts in hand, use role-playing to make sure that your prompts are clearly understood, and that they can be answered unambiguously. This allows you to develop a very natural and comfortable user interface.

((6)) Get to the Data

You've thought long and hard about your users and how to direct them simply and politely to informational or transactional services. But the user interface will only succeed if your back-end database can support the transactions. While it's still early in the development process, you should perform a thorough analysis of your database. What types of transactions is it capable of? What interfaces are required? Can you find efficiencies by integrating with a Web-based application (e.g., front-ending the same data server)?

Don't wait until you're ready for deployment. Answering these questions now will help you avoid over-taxing your database later on.

■■■ **CHECKPOINT: Write a project plan and obtain necessary "sign-offs."**

((7)) Develop Your Application

In years past, the application development phase required the expertise of speech scientists and veteran programmers. Not to mention many months of tedious work. Today, many advanced tools are available to accelerate the process.

Build the Call Flow

Take your "on-paper" call flow map and bring it to life. Using pre-packaged speech modules with configurable parameters, you can quickly create the self-service interactions that you have planned. Eliminate trouble-shooting later on by testing component parts of your application as you build them.

SpeechWorks' patent-pending DialogModules make it easy to build applications by allowing you to assemble speech functions using a "point and click" interface in one of several leading, graphical development environments, reducing coding and speeding time to market.

Create A Recognition Context

The "recognition context" is the application's speech dictionary that will be used to apply meaning to your callers' spoken words. Define this dictionary in the context of your application focusing on what callers will say (e.g., "checking" or "savings" in a banking application) and how they may say it ("I would like to know the balance in my checking account, please.") The better you define your recognition context, the better your application will perform.

Record Prompts

Prepare for testing by simulating a back end system and recording your prompts. Keep in mind that prompts are especially critical in speech as they reflect your company's personality. Selecting and directing your voice talent well is the secret to creating a system that callers will use again and again.

We invite you to use the SpeechWorks Rapid Prototyping Center to build and test application ideas early on. This environment will help you get a feel for caller interactions and assemble the basic building blocks you'll need to create a full-scale system.

Conduct Usability Tests

We recommend one-on-one observed sessions for this phase during which your developers and human factors specialists will flag any confusions with the user interface as designed. As you review your results, consider the goals established at the outset. Evaluate transaction completion, and work to achieve a rate of 95% or more.

Rapid Iteration

The most important word at this stage is "iteration." It's unlikely that you'll get it exactly right the first time, and to achieve the best results you should plan on several loops of testing and refinements. Over time, add new functions, make your data more realistic, and correct and improve the user interface – prompts, call flow, and recognition contexts – based on the feedback you obtain.

■■■ **CHECKPOINT: Integrate your system and perform functional tests.**

((8)) Conduct a Pilot Test (Did you get it right?)

Pilot testing will help you determine whether callers are really going to respond as expected. Make your application available to a limited group of people who can use it in realistic, unobserved settings. The closer these people match your target users, the more accurate the results will be. For a system where repeat usage is expected, try running the pilot test long enough for some users to become "experts." The best pilot test will include several hundred different callers and several thousand calls.

Analyze the interactions using a variety of tools and approaches. Listen to lots of calls off-line and analyze each in detail for signals of confusion, out-of-vocabulary utterances and misrecognitions.

To help in this process, SpeechWorks includes advanced Tuning Tools that provide statistics on a range of items, and informative details on each call.

You may also conduct focus groups or surveys to learn more about what callers liked and did not like about your application. Use this input wisely and take the time now to refine and improve your system. Typically, transaction completion rates rise significantly with a more finely tuned user interface.

Again, its important to cycle back, incorporating what you've learned and re-testing the application.

((9)) Deploy the System

Bring your application to market in a controlled roll-out. At this time, it's absolutely critical to monitor and analyze calls on a daily basis. Don't let unexpected results disappoint you. Few pilot test groups are 100% representative of the target audience, and other variables may have intervened during testing. Remember,

people are now trying to accomplish a task, not just test a system.

Again, you should re-visit your initial objectives. Are callers in fact using the system as you expected? Are they conducting other types of transactions? Most important, are they successfully completing the transactions that they set out to do? Do your reports indicate repeat usage?

> *In one launch, an application that appeared satisfactory in pilot testing began to fail repeatedly at one critical point, where callers were asked to speak their "10 digit account number." Upon analysis, it became clear that "real" users didn't always know where to find that number. The prompt was changed to "speak your 10 digit account number that is located in the upper right hand corner of your statement underneath your address." Accuracy and transaction completion rates subsequently soared.*

Use tools to determine transaction completion and efficiencies. When trends appear, perform detailed analyses of sample calls. You may want to conduct additional research to gain a better understanding of callers' reactions.

Ramp up your caller volume, either by expanding geographically, or by introducing a service to successive groups of users. Then gradually make it available to a wider market.

((10)) Plan on Continuous Improvement

Ongoing transaction completion rates can tell you a great deal about how callers are reacting to the system. You can and should demand transaction completion rates in excess of 95%. If you're not reaching that number consistently, look back at the objectives you outlined in Step 1. Were you true to your original goals? If not, further tuning of the application is necessary. With feedback from callers and continuous modification, a speech application can always improve.

Evaluate your system every few months. Are users behaving differently now that many of them are familiar with the system? If you started with an informational service, is it time now to add speech-enabled transactions?

Continue to look at transaction completion rates and analyze calls. Survey your customers. The conclusions you draw from a careful, periodic assessment of your application will help you optimize the system, to the benefit of both your callers and your company.

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If you want more information about the best project life cycle for speech applications or would simply like to meet with a SpeechWorks representative to discuss how you can take the next step, please call + 1.617.428.4444 and say "SpeechWorks."

SPEECHWORKS • BY ALTECH
695 Atlantic Avenue, Boston, Massachusetts 02111
phone: +1.617.428.4444
fax: +1.617.428.1122
www.altech.com