

## VUI Visions

### Get to Know Your Caller with Natural Language Data Collection

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*In this guest column, we ask designers skilled in creating Voice User Interface to highlight a particular aspect of VUI design inspired by actual deployments. In this issue, Michael Moore, Business Design Analyst, and Michelle Winston, Sales Engineer, **West Interactive**, address what this newsletter has called “main-menu mentality” and discuss a way to avoid being overly prejudiced by existing DTMF-inspired prompts. Mike is a senior member of the West's Expert Solutions Group. His responsibilities include speech application analytics, VUI design, usability analysis and testing, and designing integrated applications that incorporate speech/touch-tone and live operator support. In addition to his expertise in call automation, Mike also has eight years of call center experience and has been involved in virtually every aspect of call center management. Michelle is a sales engineer with West's Expert Solutions Group. Before joining West, she was with The Gallup Organization, serving as product manager for its metrics delivery platform. She has expertise in usability analysis, user interface design, and performance measurement—particularly in evaluating performance of customer service interfaces.*

Traditional approaches to VUI design are conducted primarily from the inside-out—that is, from the designers' point of view ...out to the customer. Often that perspective is based on a limited pool of caller information. Existing business processes, agent disposition data, and logs from applications are primary sources of design cues. But do these sources alone provide an accurate depiction of caller behavior? We contend that another, highly effective, approach to VUI design is to learn customer requirements directly from the mouth of the customer. Adding a new requirements research tool to your repertoire will lead to better design, which will delight your customers and reduce costs per interaction.

Traditionally, design for new applications has largely been driven by information gathered from legacy applications. In essence, the new speech applications still have their roots in DTMF design. These are directed-dialog, menu-driven applications that guide callers through a series of prompts. The prompts are intended to help callers complete their objective—either through automated self-service functionality or via an agent. Caller behavior data from directed dialog menus have always told us what options callers select most often. Unfortunately, the data set is restricted to the options that we offer the caller. We don't get to hear why individuals are *really* calling, nor do we get to hear it *in their own words*. Reviewing caller behavior data, conducting focus groups, and administering usability tests give us some insight into what callers are thinking as they are navigating through these systems. However, since callers are operating in a controlled environment, data derived from the tests don't really tell us what callers are thinking *at the precise moment they call*. Furthermore when we observe callers in a controlled environment like a usability study, they are motivated to get through the test system in accordance with the objectives stated by the test coordinator. A restricted list of options that are indicated by a confined dataset limits visibility into caller intent. It raises the question: If we don't know what our callers want to do, how can we design self-service applications that they can use? It's no wonder there are so many people banging away on the zero key!

The emergence of natural language speech technology allows designers to rethink not only the concept of a main menu, but also their perceptions of what callers *really want to do*. This innovation in speech science presents us with a new design tool. Today, designers can expand their field of vision just by asking customers why they are calling. Callers to natural language applications respond to an open-ended question like, “How may I help you?” with a range of naturally worded responses. They have the freedom to give any answer they wish; they're not limited to the list of choices the designer gives them. By offering callers an open-ended response, callers—in their own

words—reveal their true intent. Simply hearing the voice of the customer and understanding why they are calling provides a compelling source of information to drive UI design.

Copious amounts of customer utterance data are required to design and develop a natural language application. A common technique to capture data is to record an open-ended question, place it at the top of the call flow, and record the caller's response. The recordings are then transcribed, analyzed, and used to build the corpus of utterances needed by the statistical language model (SLM). But these utterances have more value than just for the SLM. Indeed, they can yield valuable information for the VUI designer about what callers want, how they make requests, and the jargon used when making requests. Ultimately, designers can use these customers' free-form responses to evaluate existing functionality for making design decisions. For instance, they may wish to grow functionality in some areas while streamlining or reducing it in others. They may alter prompt verbiage and speech grammars in order to make the application and user experience more efficient and friendly. Or the utterances can be used to provide a clearer idea about why people are calling for marketing and customer-service purposes. A rich set of customer utterance data can be used to drive design decisions for multiple application objectives.

The utterance data can also indicate ways in which callers articulate requests. Take a situation, for example, when a patient goes to a doctor. Upon conclusion of the visit, the doctor's office will file a claim with the patient's insurance company. Later, the patient may call their health insurance company to find out if their "bill was paid." However, a typical set of menu options may ask the caller if they want to "check on a claim," "find out when eligibility begins," or "indicate what benefits are covered." Unfortunately, while "claim" may be common jargon in the insurance business, it is not necessarily a term universally known to the public. The caller may become confused and want to speak with an agent. The question that the VUI designer should pose is, "When a caller wants to check on a claim, *how do they ask the question?*" Natural language data collection can provide an answer. In a recent test conducted by West Interactive, our utterance information showed us that a large percentage of callers were asking to "check on a bill" they received—not inquire about the "status of a claim." This proved to be valuable information for us in designing future applications of this type.

Callers are often able to articulate their full objective when presented with a free-form prompt. A key benefit of natural language technology is the ability to flatten menus and drop callers deep into a call flow if their answer is specific enough, thus saving time and improving caller experience. During utterance analysis for a test application, we heard customers saying, "I want to pay my bill with a credit card." With that single response, we know that the caller wants to *pay their bill*. And we also know *how* they want to pay their bill—with their credit card. So the VUI design doesn't need to ask the caller for method of payment; we already know it, thanks to the open-ended natural language prompt.

Another benefit natural language prompts offer is that they help VUI designers to gain visibility into the full range of requests a caller may have, and track them for analytics and future VUI design purposes. This is helpful to both the customer service and marketing departments, the latter of which is always interested in knowing the effectiveness of their advertisements and promotions. In the customer service case, information gleaned from responses to a natural language prompt can help VUI specialists to design "intelligent" applications for callers that are simple, relevant, and intuitive.

Much can be learned from the natural language data collection process, and those discoveries can be applied to improve VUI design and application analytics. What can NL data collection and analysis tell about the existing functionality of our self-service applications? While we may be confident we know the needs of our callers, how can we know for sure? By opening the range of responses to a virtually unlimited array of utterances, we gain perspective and develop a better understanding of customer objectives. By paying attention to those objectives and designing an application accordingly, speech applications can provide better service and do so more efficiently

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and effectively. Customers are calling to ask for something. The natural language prompt provides VUI designers with the means to hear exactly what that is.