

# You Don't Have to Get Personal! IVR Customization via Situational Awareness

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## Introduction

Customization for IVR interfaces is typically thought of, and often sold, as a method for tailoring callflows and prompts based on information about particular individual callers to give each a personalized experience. Organizations often object to this sort of customization, saying that it's too expensive or time-consuming to collect and store data on each caller, and that doing so raises privacy and security concerns (see the companion papers from the 2009 AVIXD Workshop for rebuttals to this sort of argument against personalization). Speech vendors are sometimes guilty of shying away from customization as well for fears of the uncertainties and technical complexities it may introduce. As a result, organizations reject customization altogether without considering alternate ways of using it to improve caller experience without using individual caller data.

In fact, there are many customizations that do not require data about each specific caller in order to produce highly relevant, intelligent interactions that nonetheless feel personal. These non-personal customizations involve using information about what's happening at the time of a call within the relevant domain—in essence, orienting the IVR to the situation—and creating IVR interactions that demonstrate this awareness. The beauty of this type of customization is that incorporating situational awareness often does not require additional technology or collecting additional data. Simply by leveraging information organizations already have and following some design guidelines, it's possible to create IVR applications that seem smarter, more trustworthy, are more likely to be used willingly by a wide variety of callers, and even feel personalized.

## The Importance of Situational Awareness

We use the term situational awareness to refer to the perception of factors relevant to a conversation and using these perceptions to adjust the content and flow of an interaction. In daily life, situational awareness simply refers to knowing what's going on around you, being oriented in time and space. Situational awareness is a baseline expectation among people with whom we interact; no one willingly attempts to have a productive conversation with a person who doesn't know where they are or what's going on around them. We expect to share common ground [2] in conversation; when someone refers to the external situation (which is observable by both parties in the conversation), it puts the speaker at ease and allows him to interact effectively.

Unfortunately, many IVRs display a complete lack of situational awareness, thus forcing callers into an uncomfortable and perhaps even untrustworthy interaction. IVRs often appear to be ignorant of any current situation other than a base level customer service scenario, yet we expect callers to happily interact with the IVR, trust the information they get, and believe that their transactions are being processed correctly. By failing to incorporate and act upon information about what's happening in the relevant domain at the time of the call, we are undermining callers' trust and satisfaction with IVRs, thus diluting the value of the IVR to both caller and organization. If callers think the IVR is ignorant or untrustworthy, they're more likely to reject self-service and opt out to call center representatives, no matter how difficult the opt out process is.

## Characteristics of Situational Awareness

Many different kinds of information may be relevant to the conversation between the IVR and caller and can be used to enhance situational awareness. Not all of these apply to every IVR, but designers should consider how each of these factors could influence callflow and prompting.



## Context of Use

We define context of use as the answers to questions like, ‘where is the caller when he makes the call?’, ‘what time or day is the call made?’, ‘what objects or information does he have available during the call?’, and ‘what frame of mind is he in?’ Consider a prescription drug refill application in which the IVR needs to collect the prescription number. The interaction might sound like this:

IVR: “What’s your prescription number?”

Caller: [silent]

IVR: “You can find the prescription number in the upper right-hand corner of your medication label. Or you can say ‘I don’t know the number’.”

Putting aside the issue of using silences within prompts, the timeout reprompt above demonstrates situational awareness by realizing that silence is often a sign of confusion and that the caller is likely to have the medication bottle at hand when he calls for a refill (this is probably where he found the phone number, and the bottle was probably what reminded the caller that he needed a refill in the first place). This is a good design because not all callers will hear this additional information; only those who fail to respond in time and show that they might need extra help to give a good response. Well-timed hints like this feel very personal to callers because the IVR is giving them just the information they need at that point in their call, even though the hint is not directed at any caller specifically.

Context of use also includes the timing of calls. Call center management is typically well aware of peak volume times daily, weekly, monthly, and seasonally. Knowing the reasons for increased call volume can lead to better design decisions. For example, bill payment calls often increase several days after bills are sent out as well as near paycheck dates. Enabling that task to be more visible and more quickly accomplished in those times has obvious positive effects.

## Organizational Knowledge

Making use of knowledge about relevant events happening within the organization also contributes to situational awareness. For example, if an organization is running a promotional campaign, the IVR should include verbiage and options in support of the campaign. Recently, a cable television provider failed to build awareness of a promotional campaign into their IVR. The cable company was offering special pricing for customers who subscribe to multiple services; the marketing campaign was featured on the company website and in print mailers sent to consumers. In the IVR, however, there was no mention of the special offer and the caller was still forced to choose which single service he was interested in ordering. This made the IVR out of touch with the rest of the organization, and perhaps resulted in lost revenue if callers were unable to figure out how to order multiple services under the special offer using the IVR menus. In this case, situational awareness benefits the caller by offering timely and relevant options, but also benefits the organization by supporting an existing promotional campaign through the IVR.

Another example of leveraging organizational knowledge in the IVR is basic knowledge about the company’s schedule. Many IVRs offer unchanging menus, irrespective of whether the company is open for business, databases are available, or if there are representatives available to take calls. When an IVR offers the caller an option, it implies that the option is valid and the company can help you with that. If the IVR then tells callers

‘sorry we can’t help with that now—please try your call again later,’ it’s playing bait and switch, and makes the caller feel like they were fooled into making a bad choice. If only self-service options are available, it makes good business sense to inform callers of this. It makes the IVR seem more trustworthy and respects the caller’s time by letting them escape early if you can’t help with what they want.

Similarly, some organizations are hesitant to admit when there is an outage or other service failure that is causing problems for customers. A client of one co-author specifically requested not to mention system outages in the IVR, while admitting that outages drive a significant number of calls. The reasoning was that some customers might be unaware of the outage and the company didn’t want to call it to their attention, potentially casting the company in a negative light. This is exactly contrary to building situational awareness—it’s willfully ignoring an issue that’s affecting customers—and is likely to drive more calls to representatives and cause customer distrust, thus negating the value of the IVR. In the end, the client agreed to acknowledge local outages for callers who indicated they needed technical support. These callers were already experiencing some problem, which were likely caused by the outage in their area, so the client was satisfied that the IVR did not over-broadcast the outage to those calling to pay their bill, for example. But by acknowledging the outage, the customer used the IVR intelligently to deliver timely information to callers and divert the extra calls usually associated with outages. This example points out a potential objection to customization raised by organizations; they often reject customization because they only think of solutions that have negative consequences. It is the designer’s responsibility to find and present the compromise solutions that meet both caller and business goals.

Less obvious schedule-related events can also be used to build situational awareness. In the days immediately following release of a new product, companies often experience an increase in technical support calls with questions about the new product. Specifically mentioning the new product in the IVR can save time for callers and make it easy to get the information they need, thus allowing them to use IVR self-service rather than going to representatives.

## Domain and World Knowledge

IVRs rarely take real world events into account in a timely way, but doing so can greatly increase their relevance to callers. Some events that do not relate specifically to the caller or the organization are nevertheless relevant to the conversation and thus useful in building situational awareness. Events such as hurricanes or other disasters drive a huge number of calls into many businesses; the smartest companies used their IVR systems to provide information about how the hurricane was affecting their business and their customers. The ability to do so implies, of course, that the ability to adapt to situations has been built into the IVR design and code.

At the domain level, the recent HD television transition generated calls to cable and satellite television providers and television retailers. Those that offered information about the HD transition in their IVR systems benefited by reducing the number of calls to the call center for this information. Not every world or domain event affects every IVR, but it benefits organizations to address the relevant real world events in the IVR, especially with an adaptive framework that can be changed relatively quickly.

## Knowledge of Caller Groups

Information about who's calling at a population level, rather than at the level of individual callers, can help build situational awareness. Many IVRs serve more than one caller population and it pays to use knowledge about which group a caller falls into. Some applications serve callers with different backgrounds who use the IVR in different ways, such as stock trading applications that serve both professional day traders and amateur infrequent traders, or health insurance applications that are used by both healthcare professionals and individual members. In cases like these, the caller can be identified and the IVR can make use of existing information in the group profile to tailor the IVR interaction to that type of caller. Such adaptations are not specific to the particular caller, but often feel very personal because the application is meeting the caller's individual needs as a member of his caller group. The caller is not really aware of the distinction and doesn't need to be. If it's not possible to identify caller group via stored data, the IVR can also ask callers to self-identify as member of one caller group or another, like health insurance applications that ask 'are you calling as a healthcare professional?' at the beginning of a call.

IVRs can also incorporate information about different customer segments based on their relationship with the organization, like contract customers versus pay-as-you-go customers for mobile phone companies or varying levels of travel club membership. Here the difference between caller groups sometimes is not in what they know or the tasks they need to accomplish, but in how the organization wants to treat each group. Companies often want to give better service to their premium customers; identifying callers as premium customers and offering better service is a good example of situational awareness.

## Knowledge of Caller Behavior

Another opportunity for building situational awareness comes from looking at the in-call behavior of individual callers without identifying them. The behavior is associated with an individual caller, but we do not need to know who the caller is or apply any personal data about the caller in order to modify the IVR interaction—the data is individual but anonymous. One example of this is technology that adjusts the playback speed of recorded prompts in response to successive caller responses. This algorithm plays prompts more slowly for callers who respond slowly or have trouble giving appropriate responses, and more quickly for callers who respond quickly and appropriately. The adaptive algorithm is based on the behavior of individual callers but does not look at who the callers are or even the specific content of their responses [2].

Another example is a case where the duration of caller utterances was used to modify IVR behavior. For this IVR, an analysis of recorded calls suggested that responses longer than 3 seconds at an open-ended ('what are you calling about?') prompt tended to result in misrecognitions and eventual transfers to a representative. By evaluating the duration of the caller's response, the IVR could switch to a menu-based approach for callers who gave long responses and avoid recognition failure. It is not who the caller is or what they say that triggers the change in the IVR interaction; it is simply the behavior as displayed in the duration of the utterance. Using anonymous individual caller behaviors is more data-intensive than other techniques we suggest. In order to use specific caller behaviors to trigger changes in the IVR interaction, there must be a large, well-analyzed data set of the occurrence and results of the behaviors that allows the designer to select and design proper responses [3].

## Designing Situational Awareness

The information and processes needed to build situational awareness into IVR applications already exist, so why don't more IVRs exhibit situational awareness to improve the caller experience and serve more calls in the IVR? The main problems are an inadequate focus on customer experience and a lack of coordination and communication. The customer experience issue is that many companies, and even some IVR application designers, do not examine the needs of callers deeply enough nor do they look at solutions beyond the provision of basic customer service functionality. The type of customization covered in this paper requires significant and thoughtful user research and analysis leading to the construction of user personas, also known as caller profiles. From those, context scenarios can be built that will give rise to the types of situations that the IVR application should be aware of.

Regarding coordination and communication, different departments at the same organization often fail to communicate with one another, so the team responsible for the IVR may not know anything about promotional campaigns that should be part of the IVR. If product management doesn't communicate about a product release, there is no way for the IVR team to adjust to it. Breaking down organizational silos in which each team lives only within their own tiny domain is critical in keeping IVRs in tune with the entire organization.

Communication is also an issue between IVR vendors and clients. Vendors who are hired to design and build IVR systems often deal, by practice or permission, only with the telephony or call center teams, who just know about their little corner of the organization. The VUI designer is often assigned one primary contact, but since no single person is aware of all the potential information we might use, this also limits IVR design. Thus as VUI designers we are not given access to all the information necessary to create a highly relevant IVR interaction. Sadly, the VUI designer is often in a position in which they are not willing or able to demand the information required to build the situationally-aware IVRs that would best meet caller and organizational needs. In order to capitalize on the wealth of information that already exists, we need to see IVRs as a representative of the entire organization, and push to get access to information from all parts of the organization.

## A Theoretical Conclusion

Many types of customization, especially within its subset personalization, require some active participation by the caller. The caller must opt-in or agree to provide additional information to make the customization work. Situational awareness requires none of this, nor does it require new technology or data storage. In fact, callers will be largely unaware of situational awareness as customization, per se—they'll just know it was a good interaction that made sense in context. The whole goal of situational awareness is to make changes to the callflow and prompting that make intuitive sense by meeting callers' expectations about what's relevant to the conversation. If the caller notices such a change, we hope that his reaction is positive, but nonplussed, the way a restaurant patron reacts to a good waiter. This can happen because the information used for non-personal customization is intrinsic to the conversation, what Clark calls Track A information [3].

When callers come into the interaction with the IVR, they have some model of the domain, a model for how to deal with an IVR, and a model of the organization. These models are often flawed and incomplete from our perspective as designers. However, these ideas form the caller's mental model of the interaction, which is an underused but important consideration for design. The caller's mental model serves as a backdrop because

the caller is primarily driven by the task he's trying to complete. The aim of situational awareness is to ensure that the IVR is built with corresponding models of the domain, a more complete and accurate model of the organization, and an understanding of the caller and his context of use. These ideas are central principles of user-centered design, so in that sense situational awareness is a positive by-product of this design philosophy. We urge our fellow designers to do more to ensure that the IVRs we build have access to all the information relevant to the conversation with the caller.

## References

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