

Somebody’s Watching Me: Managing Voice Experience Customization

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Table of Contents

Introduction2

What is Customization?.....2

The Goal of Customization.....3

Justifying Customization.....5

Customizing Tasks for Users8

 Designing for Power Users8

 Designing for Casual Users.....10

 Dynamic Problem-Focused Design.....11

Design Implications of Customization.....12

Considerations for Designing a Customized Voice or Multimodal Application.....13

Conclusion.....14

References15

Introduction

In the current world of voice experience design, customization is the new buzzword. Businesses tout tailored user experiences as yet another example of how tuned in they are to their market. Beyond the hype, though, customization of a user's experience is often realized in rather superficial, non-helpful ways. Applications that greet the caller by name or funnel either high-value or low-value market segments through different but equally circuitous logic are the norm. Yet, there is more to customization than simply providing different experiences for different callers based on the amount they spend. At its best, customization creates the potential for efficient, targeted interaction for all users. At its worst, it instills a post-technology Big Brother into automated interaction that causes users to look over their shoulder and question how a bizarre automaton knows some intimate detail of their lives.

The purpose of this paper is to define current practice in voice user experience customization, describe its behavioral rationale from the user and business perspectives, and provide a framework for approaching customization in design.

What is Customization?

Customization refers to a range of user interface design modifications made to craft a flexible, predictable, and tailored voice interaction experience. Personalization is a subset of customization but is narrower in its definition: the user experience is tailored to a specific individual user.

In its broadest sense, customization is contextually responding to the input of any user. For example, if a user inputs his phone number to authenticate, any voice application will provide a logically-appropriate response and follow-on prompt.

System: *... and what's your phone number?*
Caller: *2 1 2 5 5 5 2 4 3 1*
System: *Thank you. One moment...*
(Lookup)
System: *Alright, I've found your account. Now, what can I help you with today?*
Payments, Sales...

However, a customized application might present one of a set of possible prompts, a unique set of menu options, or some other variable design feature that specifically depends on an aspect of the user himself, his input, his account information, or the environment of the interaction.

System: *... and what's your phone number?*
Caller: *2 1 2 5 5 5 2 4 3 1*
System: *Thank you. One moment...*
(Lookup)

System: *Alright, I've found your account, which has a payment due of \$20.00. Would you like to pay this now?*

Customization is not a matter of simply writing informative dialogue, though. It is a range of techniques, approaches, interactions, and information usage that moves from fairly generic to the very detailed, from addressing needs within identified customer groups to personal touches. To be most effective, it is also dependent on the technology chosen to support and complement a speech or other telephony application. Clean customer data, caller identification (through DNIS, ANI or both), knowledge of ongoing events, and even skill-based call center queuing are also important components of a properly customized user experience. For example, many current applications heavily rely on ANI to identify the caller and provide a customized experience. However, ANI may be unreliable (e.g., many callers present the same ANI coming through a corporate switchboard), which can prevent a well-crafted, customized experience from executing at all.

The Goal of Customization

The intended goal of customization is to provide the user with a more efficient, pleasant, and relevant interaction than would have been possible without it. In customized applications, data is intelligently utilized to lessen the social and cognitive load on the user and make him successful quickly. Well-designed, customized applications instill a perception that the application was tailor-made to address the user's current issue and the ongoing interaction is predictable, natural, and comfortable.

The following scenario provides a glimpse into the range of current design practice that may be encountered today. For each interaction, notice how each system's personalization addresses the caller's defined task:

Matilda sat down with her credit card statements and the phone. It was time for her monthly "pay the smallest amount I can" game. She dialed the first company...

System" *"Hello again, Matilda. Welcome back to The Credit Company. Did you know we've got a great balance offer at the moment. Would you like to hear more about it?"*

Caller: *"No, thanks."*

System: *"Ok, do you want a card for a family member or friend for a \$50 gift certificate toward your next purchase?"*

Caller: *"No!"*

System: *"Alright, keep in mind our sale runs through the end of the month and you've only got 4 more days..."*

Matilda threw down the phone. *“Too much,”* she gasped, *“I can never remember where that blooming payment thing is. I don’t have the energy for this right now.”* Then she picked up her next hastily scribbled number and dialed the second company...

System: *“Welcome to XYZ Cards. Please choose from hear balance, make payment or transaction details.”*

Matilda struggled through the endless prompts and made her minimum payment, her head throbbing. After a short break and a cup of tea, she picked up the last number and rang the third company...

System: *“Welcome to BearCard. (ANI lookup) Based on the number you called from, I can see that around this time last month you chose to make a minimum payment, would you like to do that again today?”* ...“Mmmmm,” thought Matilda, “just right.”

Actually achieving the goal of customization is not typically a simple or straightforward matter. In current practice, poorly or superficially designed customizations are still far too easy to find and result in unintended negative outcomes. A so-called ‘personalized’ interface might greet the caller by name. Similarly, backend information about the caller (e.g., purchase behavior) may be used to play ‘customized’ marketing messages during the user’s experience. There is not necessarily a clear correspondence between data that is loaded in the backend and what actually plays for the caller, however. For example, some applications can load large amounts of data about the user, physical environment, time of day, long-term repeat caller history, and a variety of other variables. If this data is used to consider the caller’s perspective and reason for the call, the application will be able to fork on a very specific combination of settings within all that data to play slightly tweaked prompts that are very pragmatically sensitive to the caller’s task. At the other extreme, significant amounts of data can be loaded, then the levels of social sensitivity that these data provide may also be ignored and everyone offered the same basic script.

While these various design approaches might seemingly display a smart technology backend or create profit opportunity for an organization, they do not necessarily advance the user’s task or facilitate measurable business outcomes. Instead, these designs may promote user frustration at having their own task goals derailed by information the organization deems important and relevant that isn’t important or relevant to him. At its worst, poor customization can instill a sense of creepiness, intrusion, or violation, as when the caller is greeted and personal information is conveyed in a pragmatically inappropriate way (e.g., *“Hi, John. Are you calling to change the password that expired yesterday?”*).

As a general rule of thumb, the Goldilocks Principle applies to customization: it should be just right from the perspective of the user. The critical part of this principle is that it is based on the *users’ perspective of interacting with the business*, not simply the organization’s perspective. Although this principle might seem somewhat broad or abstract, it requires designers to have clear, actionable

knowledge of the user group and their needs in order to effectively customize speech and other telephony, multimodal and cross-modal applications.

Justifying Customization

From a business perspective, the rationale for customization is often financial: how do we serve our customers best so they stay loyal and buy more? Or, how do we obtain the most value from a given subgroup of users? Customization can be used to more effectively build loyalty, target marketing efforts, up-sell, or cross-sell. The intent is to improve the profitability of a specific customer or market segment. However, these reasons and the design decisions they precipitate may not be in line with a user-centered perspective of customization.

Like other aspects of voice experience design, the behavioral foundation for customization and personalization rests in appropriately addressing user's needs. Marketing strategies often rely on Maslow's hierarchy of needs to identify consumer motivations for services and products; similarly, voice experience customization may be critically evaluated by understanding users' motivations for specific types of information or tasks. The following parameters, adapted from Maslow's research on human needs, help prioritize the relevance of a specific type of customization from a user perspective:

1. **Imminent personal events** – Experiences that provide information about an event that is about to happen to a user will be more relevant and more highly desired than information that pertains to some future or distant event, or an event that does not impact the caller directly. Though the event might not be about the individual, it is likely to be perceived as personal.

System: Thank you for calling Helix Water District. (ANI Lookup) Before we begin, I'd like to remind you your water will be shut off between noon and 2 pm, tomorrow, September 26th, while we perform maintenance on your street.

2. **Threat to safety, security or well-being** – Messaging that supports the caller in becoming aware of or helps alleviate a possible personal threat to safety (e.g., physical safety), security (e.g., financial stability, getting help with a problem), or well-being (e.g., ability to interact with others) will be highly desired by users.

System: ... and finally, what's your pin code?

Caller: 1 7 3 5

System: There's been some unusual account activity on this card. Would you like to hear the last ten transactions to make sure they're authorized?

3. **Habitual action** – Experiences that support a user’s preferred habitual behavior, both positive (e.g., on-time bill paying) and negative (e.g., consistent underpayment with accruing late fees) will be highly motivating and desired. Conversely, highlighting behavior that is not consistent with an established habit (e.g., non-payment of a bill by someone who consistently pays early) will also be positively perceived by users. As the example shows, this type of logic could be applied broadly to groups of users. Additionally, what an organization perceives as negative behavior might actually be purposeful and desired from a user perspective (e.g., last-minute bill paying while avoiding late fees) – enabling such behavior within an automated system not only saves costs for an organization for these calls but increases customer satisfaction.

System: ... your bill is due on September 24th... in order to avoid a late charge, would you like to schedule a payment for that day?

4. **Unseen process monitoring** – Experiences that allow users to observe ongoing or dynamic processes that occur out of their direct view (e.g., utility usage) but have a direct personal outcome will be highly desirable.

System: Thank you for calling Your Phone Company. (ANI lookup) You have 65 minutes of usage remaining this month. Now, what can I help you with today?

Significant customization design often occurs around monitoring behavior, which involves a user seeking specific information repetitively over time. Examples of information that users monitor includes usage data (e.g., cell phone, electric, gas), bill balances (e.g., credit cards), account balances (e.g., checking or savings accounts), weather updates, stock market prices, news headlines, and other entertainment-based information (e.g., horoscopes). Although these items are often provided by automated telephone systems, users are required to initiate action (i.e., a call to the system) to obtain the desired information. Effectively customizing message transfer may not be limited to presentation in an IVR, however. In these situations, it is often useful for experience designers to also consider how other forms of technology can proactively deliver the information (e.g., outbound calling, email, or text to cell phone) or automate the task itself (e.g., automatic bill payment). In this way, technology alleviates the need for users to remember and act on an informational need themselves; instead, the system initiates message transfer, reducing cognitive load and helping users reach their goals with minimal effort.

A common example of positive customization occurs when an outage is identified and communicated to the user, based on ANI identification. A dialogue example may proceed as follows:

System: Thank you for calling Your Power Company. [ANI match, pull up account, check address, outage in this neighborhood. Bypass Main Menu.] It looks like the power is out in your area. Is this why you’re calling? [Prompt phrased as a yes-no question to give caller an out, in spite of high probability call is related to outage]

Caller: Yes. [Database dip for estimated time retrieval]

System: *Okay. We've got a team in that area already working on it – we expect power will be back on at approximately 2pm...*

This form of customization may be highly prioritized by the designer for several reasons:

- 1. Imminent event** – the call was initiated during a known outage, which is common user behavior for this situation.
- 2. Threat to safety, security or well-being** – the caller is likely to perceive a lack of electricity as a threat to her personal safety and that of her family;
- 3. Unseen process monitoring** – electric service is a constant expectation of modern life, but one that is enabled out of the user's direct control.

The organization's motivation for modifying its call flow is to alleviate negative affect (e.g., stress, fear) and continue service over time with this customer. Practically, the design also prevents high call volume transfer to human representatives during an emergent situation, which, in turn, reduces operational costs. By recognizing the importance of the information for the customer (beyond their own business reasons), the organization supports the user in monitoring service status and earns customer loyalty. In this case, the design decision is a win-win for the organization and user.

A negative example of customization is using ANI to greet an infrequent caller by name:

System: *"Thanks for calling Electric Gold Business Services, David. Do you want to pay your service bill that's 3 days overdue?"*

Because the process of ANI recognition is unseen and not familiar to the average person, combined with the overly direct task suggestion, this may result in a negative feeling of creepiness or intrusion. In addition, this type of customization does not necessarily assist the caller in achieving his goal more quickly since it could cause confusion and frustration. Stating the caller's name is also likely to create negative affect if the caller is actually David's wife calling or if the name is mangled by the text-to-speech engine. Therefore, addressing a caller by name is not a recommended approach to personalized customization and may lead to a lose-lose situation for both business and caller.

A more difficult issue arises when users are motivated to obtain information that an organization does not want to reveal. For example, consider the case where a utility company does not want to provide insight to its consumers about current service outages. The previous example may be modified to illustrate this situation:

System: *Thank you for calling your Power Company. [ANI match, pull up account, check address] Do you want to pay your bill, report an outage, or get your usage information? Just*

say 'my bill', 'outage', or 'information'. You can also say 'help me with something else'. [Main Menu stays consistent even during widespread outages]

Caller: I want to report an outage. [Database dip for address]

System: Ok, at your property located at 776 West Side Drive?

Caller: Yes.

System: Are all your lights out? [confirm type of outage]

Caller: Yes.

System: Just a moment while we report that outage. At Your Power Company, we're committed to restoring your service as quickly as possible. Usually, electric service is restored within 12 hours when an outage occurs... [generic messaging played for all callers to reaffirm commitment to customer service]

In this case, like the previous example, user motivation for specific, relevant information is based on the nature of the situation: it is an immediate event that threatens personal safety and involves an unseen process. Yet many companies are reluctant to disclose these pieces of information at all, or only in very general terms, due to concern that if users knew how often outages occurred or how long they might take to fix, they could take their business elsewhere. By comparing the vast differences in the example dialogues, it seems clear that customization results in a more reassuring, intelligent interaction that rapidly addresses the user's needs. In cases where user- and business-requirements conflict, designers have an obligation to advocate for the end user and provide user-centered design recommendations that will make the application as efficient and task-oriented as possible.

Customizing Tasks for Users

Customization presents a special challenge in usage, and also design, depending on the nature of the user group and tasks to be completed within an IVR. Here we discuss special issues in effectively designing for users who call an application with varying frequency. Then, we consider the special case of designing a highly customized experience for users with a problem-focused goal.

Designing for Power Users

The Power User is someone who calls an IVR application repeatedly over time. For example, a clerk in doctor's office may call the same IVR several times each day to verify patients' insurance coverage. Similarly, a truck driver might call the same IVR several times each day to report their current location. Also, some banking customers prefer to check their balance by phone rather than online, and may call several times each week. Although 'frequent' can range from multiple daily to one-per-

month calls, here we consider a Power User to be one who conducts a fairly simple and routine-ized task with the application often enough to remember the experience from one call to another.

When designing for a user population with a known or suspected group of Power Users, it is critical to understand their behavior and expectations prior to making changes to the experience. For example, it has been observed that some frequent callers of an IVR system will memorize a sequence of inputs without listening to prompts and successfully complete their tasks. This behavior is often a coping mechanism for an experience that is not appropriately designed based on user knowledge and expectations – it is an indicator of poor overall usability, despite task success. A usability evaluation is helpful to effectively diagnose the core problem(s) leading to this behavior.

Customization may be used to alleviate at least some of the navigation problems that lead to memorization, as when the repetitive pattern of usage is identified and a simple yes/no question opens the dialogue (e.g., “Do you want to do <your regular task>?”). Consider a clerk in a doctor’s office who frequently calls an insurance company to verify that a patient has health coverage. The beginning of a non-customized call flow might sound like this:

System: Thank you for calling Health Now. First, tell me whether you’re a member or a health care professional.

Caller: (barge in) Health care

System: Thanks. Now, you can say verify coverage, benefits, or claims.

Caller: (barge in, DTMF) 1

Because the clerk has called this system so much, she blows right past those prompts and switches modalities based on other tasks she’s doing simultaneously. An ill-conceived customization might dynamically reposition options in the initial menu, depending on the last call to the application. Suppose a couple of calls were made for claims instead of coverage, and when she calls in next, she hears the following prompt in turn two:

System: Thanks. Now, you can say claims, verify coverage, or benefits.

If she uses her habitual behavior and selects 1 at this menu, she’s headed down the wrong path. If she’s halfway listening, she may be thrown off by the change, leading to more confusion and a potential opt-out farther downstream. Consider this better use of customization:

System: Thank you for calling Health Now. (ANI lookup – know it’s a provider, so skip the first question, know 85% of calls are for coverage verification). Are you calling to verify coverage for a member?

Caller: Yes

She gets right to the intended target. Yet, for the less frequent tasks such as claims, it's easy to get to the other options as well.

Even when a well-designed modification is made to an interface, it is common for Power Users to have a short period of adaptation, in which they experience more timeout and retry errors, then self-correct based on additional feedback from the system, followed by improved performance with few errors. The initial resistance to change (i.e., requiring the user to actually listen to prompts and respond requires more cognitive effort than rote execution of input) should not cause a design modification to be misinterpreted as undesirable if the expected increase in usability is observed. Nonetheless, customization is not a panacea for an application development approach that does not include rigorous user-centered design and usability testing activities.

Thus, for Power Users, general customization rules-of-thumb would encourage designers to be conservative and cautious as they initiate interface changes. Power Users should participate in usability studies that allow them to complete their most common, familiar tasks with the application but also some that are very infrequent (or have never been done in day-to-day usage), to compare whether the organization and wording of the interface is understandable and navigated effectively for these different interactions. If Power Users only experience usability problems on tasks they aren't highly familiar with (while sailing through their common tasks with qualitatively different behavior), it should be an indication that the interface's organization (i.e., information architecture) may need to be revised. Finally, designers should expect that the learning curve might be lengthened for some Power Users – they could experience interference based on their knowledge of the older interface, as well as negative reactions to change, even if the experience is ultimately easier and more pleasant. These outcomes are typical for a short period of adjustment and should correct after a brief period of adaptation.

Designing for Casual Users

Unlike Power Users, the Casual (or infrequent) User has no memory of an interaction from one call to another. They do not call an application repeatedly over time to conduct their tasks; they may execute one-time only calls or calls that occur monthly or less frequently. Unlike Power Users, their expectations about how the interaction probably will go are not based on their previous experiences with an application.

When a user population includes a majority of Casual Users, usability testing is also critical to understand their behaviors. In mixed populations of Power and Casual Users, the designer must be careful to recruit representative samples of usability participants from both groups. Their expectations and behavior with the system can vary dramatically and it is critical to understand how to prioritize design for each. Designers may have less data on Casual Users as well, which may be a gating factor for effective customization.

Best practice rules-of-thumb for Casual Users encourage designers to include a broad set of usability test scenarios that provide comprehensive coverage of the user interface. In addition, a focus on understandability of wording will be critical to ensure that any jargon is identified and revised with more accessible vocabulary. In contrast to interfaces intended for Power Users, the use of dynamic menus is not considered problematic with this population because they are unlikely to use recall as a mechanism to support navigation. Therefore, designers can make use of backend data to offer logical options based on the context of the call. In general, there is no such thing as too much data to examine in order to provide the best and most customized experience. For example, an application that has access to real-time diagnostics and billing systems should take full advantage of that knowledge to offer the most *appropriate* functionality to the caller. This may mean only a slight change in wording to a single prompt. An *inappropriate* use of data generally correlates with an inappropriate human-to-human interaction; if it is wrong for a live agent to immediately greet a caller by their first name, then it is also wrong for your IVR to do the same.

Dynamic Problem-Focused Design

A special case of interaction design occurs with problem-focused tasks, as in technical troubleshooting or healthcare diagnosis. In this type of interaction, the user calls to address a specific problem; his goal is to identify the problem and get it fixed. The user expectation is that the sequence of information intake about the problem will be highly dependent and variable, as well as independent of any other previous interaction about a different problem. When this process is automated, it requires a callflow that is different for every call received.

In problem-focused interaction, the relationship between consistency and predictability is not simple. Users may effectively predict an application's behavior even though prompts vary with each interaction, assuming the script is sensitive to the social environment of the call through sophisticated backend data. It is typically the case that the simplest user interactions on the front end are achieved through a sophisticated mix of data and diagnostic logic on the backend.

System: Thank you for calling your Internet Service Provider. I see that there might be an issue with your modem; are you calling because you can't get online?

Caller: Yes.

System: Okay, I'm going to try to reset your modem from here to bring it back online. If you still have that Motorola, you may notice the two green lights on the left start to flash. When they stop flashing and go solid green, you'll be able to get back on the Internet.

Conversely, a consistent menu structure that does not make use of any other knowledge about the caller and his context will impede users from correctly predicting what comes next. Well-designed customization can introduce a very naturalistic variability to speech-based interaction that makes it seem more felicitous, in keeping with our social expectations of conversation and high quality service: like people in spontaneous interaction, the IVR tailors the dialogue to its knowledge of the caller, his

context, and his patterns of behavior while maintaining the social distance expected of service providers. As we have seen, there are many ways to design customized voice experiences, which need to be applied with caution.

Design Implications of Customization

A broad number of design elements may be customized based on user requirements, business requirements, or some combination. Table 1 shows these elements, as well as a selection of examples showing how they might be customized. Please note that these examples are not recommended design guidelines but, instead, illustrate current practice in voice experience design.

Table 1. Customization Design Examples

Major Design Decision	Specific Design Element	Example
Technology Selection and Implementation	Modality (DTMF vs. speech)	Allow customers to specify their preferred mode online or in the IVR system. Identify previous usage of DTMF and offering this option
	System-initiated transfers	Transfer to agent: <ul style="list-style-type: none"> - within 2 hours of flight time - when a payment is 30+ days past due - when reco problems occur in certain flow areas - when an account has been compromised, or in other situations best handled by an agent and not discovered by the caller in an IVR - when a product is unsupported or no longer supported
	Inbound calling vs. outbound notification	Outbound reminders about appointments, payments due, and flight information. Inbound calling may be more appropriate for information that is not time-dependent.
Script	Call flow or task sequencing	Offer a stand-alone payment choice within 10 days of the due date. Offer the caller's most common action, then fall back to most frequent task types based on overall utilization data.
	Menu selections	Changing menu content based on account characteristics – <i>"Please choose one of these <variable number> options:"</i>

	Language selection	Allow customers to specify their preferred language online or in the IVR system
	Prompt content	Allowing customers to specify their preferred prompt style online or in the IVR system, such as 'expert' (frequent caller) or 'helpful' (infrequent caller)
Voice talent and speech/audio presentation	Voice talent selection	Allowing customers to specify their preferred voice online or in the IVR system.

Considerations for Designing a Customized Voice or Multimodal Application

In the context of a project, aspects of customization may be suggested or even forced into a dialogue design as business requirements. However, as we have seen, not all requirements suggested by the business are inherently valuable for the user population. The following list of considerations will help designers steer the project toward the proper blend of user and business perspectives:

- What is the user's motivation for this task and/or information?
- What context is the user in when seeking this interaction?
- How does this messaging or task flow address user needs?
- How will this customized approach improve the user experience (as compared with the non-customized approach)?
- Who benefits from the customized design?
- What behavioral difference in usage occurs for this user subgroup that indicates customization is appropriate?
- If customization improves the experience for only a subset of the user population, does it detract from other subgroup's experiences?
- Does the customization destroy or impair predictability of the application for frequent callers?
- Is the user's mental model of the activity damaged by the customization?
- How many dialogue turns will the customized design eliminate to reach task completion?
- How many menu items will the customized design eliminate to simplify task selection?
- How does this customization increase ease of use (or decrease user workload)?

- How does a user opt out of or over-ride a customized suggestion or option? Is it easy to complete highly unusual or exception-to-the-norm tasks?
- Is it logical to offer all tasks as a customized suggestion? Do some tasks occur at variable or widely spaced intervals? (e.g., ordering checks)
- Is there another way to provide this information, execute the task, or meet the need that requires less effort by the user?
- How many times has the user's task been interrupted? (consider when the user's intended task is the same as the customized task and when it is different)
- To what extent does this customization (or lack of customization) result in the user's perception of intelligence or self-awareness by the business?
- Does the proposed customization impede the user's progress toward her goal?
- Will any required additional data lookups or processing to drive the customization result in longer calls for the user?
- Is suitable data or storage for new data available to enable the customization to be relevant to individual users?

Conclusion

While businesses and designers rally around the concept of customization, it is vital to remember that customization needs to result in a real and perceived benefit for the *user*. While businesses may have noble intentions of giving the caller what they need, rather than what they ask for, there is still a narrow range of proactive information that a caller will accept when a system detours callers out of their intended task. Therefore, it is recommended that customization efforts focus on alterations to call flows that are of immediate and easily apparent benefit.

However, the designer's challenge is to provide benefits to both the user and the business – if there is no benefit to the business, investment cannot be justified; if there is no benefit to the user, there is the danger of a negative impact on the business. Thus, designers often walk a fine line between satisfying the business and the user population. In the end, like other aspects of voice experience design, appropriate customization and personalization depend on the designer's knowledge of the available tools and ability to justify his design decisions and optimize a critical customer touchpoint.

References

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