

Thinking Outside the Box: Designing for the Overall User Experience

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Introduction

Voice User Interfaces (VUIs) are not experienced by callers in isolation, and neither should they be designed that way. *Interactive Voice Response* (IVR) systems work best when they are designed to help people achieve their goals within the broader context of their end-to-end interactions. To achieve this, VUI designers and the IVR project team need to understand the target callers, their goals, the environments they are in, artifacts and knowledge that will bear on their interactions, and what they might be doing before, during, and after interfacing with the IVR.

Here we outline four methods that organizations can use to achieve this goal:

1. Conduct field research on the end-to-end user experience
2. Involve agents
3. Link siloed channels
4. Encourage cross-team empathy for end users

These strategies are described below, followed by a few illustrative case studies.

These recommendations are intended for the entire IVR project team. Some of these areas the VUI designer will be directly responsible for. For others, the VUI Designer will need to work in a consultative role with key stakeholders within the organization to realize the full solution and to ensure the end-to-end experience fits together from a customer perspective. VUI designers can take a leadership role in bringing the cross-functional project team together and imparting a user-centered design approach.

Field Research on End-to-end User Experience

An initial assessment of IVR requirements typically involves consulting with business owners to gather their view of the end-users' needs and expectations. But this alone is not sufficient. Often times business managers prioritize solution requirements based on what is best for the business, which may not always align with end-user needs. And subject matter experts may be too close to the business – its (siloed) organizational structure, (bonus-driven) business goals, internal policies and processes, and specialized jargon – to accurately judge the end-users' needs and expectations.

One of the best ways to understand the callers, their goals, and their environment, is to get as close to the callers as possible. Ideally, we could observe real people in their home, work, or wherever they are

when they call the IVR. The types of things we would want to learn from these kinds of observations would include:

Who should we be designing for? What are the characteristics of the target calling group(s)? What are their goals and motivations?

What characterizes the environments these people are in when they call?

What do users know or have around them when they contact the company (knowledge, terminology, artifacts, equipment, Websites)? What are they doing while interacting with the IVR?

What is the end-to-end process for completing their desired goal? Can users complete it within the IVR, or this simply one step in the flow? What happens before, during, and after? What other 'actors' do users need to interact with to accomplish their task (agents, store personnel, etc.)?

These are some of the questions that need to be explored to create a seamless end-to-end user experience. There are no pat-answers – the right answers need to be discovered and customized for each unique solution.

These answers can be uncovered through *field research* (also known as *ethnographic research*), which may be based on either direct observations and research with callers, or indirect methods of investigation that reveal aspects which could impact the user's overall experience. Field research conducted early on in the sales and project lifecycle shed extremely useful insights that can shape the requirements and strategic roadmap for the VUI and end-to-end caller experience. These techniques can also be used to assess the effectiveness of changes and plan for future changes or enhancements. Field methods can be used to investigate:

Direct Field Research with Callers

- Live or recruited field observations of callers interacting with the existing IVR or a prototype or pilot deployment of the new solution
- Analysis of whole-call recordings (ideally capturing both the customer-IVR and customer-agent portions of the interactions)
- Photos/videos/observations of users' environments (home, office, airport, etc.)
- Sample user documents/artifacts (e.g., member ID card, statement, equipment, etc.)
- Diary studies / journaling by users
- Interviews and/or surveys with representatives of target caller group(s)
- Users' desired goal(s) and their *mental model* of the tasks and process for achieving that goal
- Card sorting and naming exercises to determine optimal menu structure and wording
- Channel preferences (Which channels and media (web, email, chat, VUI, phone, text messaging, fax, mail, in-person, ATM, etc.) do users prefer for which types of activities? Where do the transitions from one channel to the next occur, and what's required for a smooth handoff?)

Indirect Field Research

- Business success metrics (e.g., customer/staff engagement scores, service automation targets, sales revenue targets, etc.)
- User/Customer segmentation and demographics
- Marketing brand positioning and attributes (current and desired), as well as sample TV, radio internet and print-media advertisements (i.e., useful for developing the VUI's *Persona*)
- Prioritization of business opportunities (i.e., Which customers/leads/tasks are most valuable to the business and should be handled by an agent? Which customers/leads/tasks are less valuable or have less impact on customer engagement and can be handled via automation?)
- Existing website (structure, functionality, terminology, web behavior analytics, web-based communication channels (email, chat, click-to-call), etc.)
- Existing and future IVR (structure, functionality, languages supported, terminology, containment and task completion rates, opt-out "hot spots," backend and contact center integration, etc.)
- Contact center call types and volumes (call topics/wrap codes, subject matter and skill specializations, languages, average handle time, first call resolution rates, transfers/referrals to other teams or other channels, sales leads and service-to-sales opportunities, etc.)
- Contact center infrastructure (skills-based routing, screen-pop of data to agent desktop, customer profile data, intranet/knowledgebase , etc.)
- Agent and contact center staff interviews
- Contact center service observations with agents (live observation of calls and agent work environment)
- Sample agent documents/artifacts (e.g., FAQs, training materials, etc.)
- Reporting and analytics
- End-to-end workflow processes and policies (This may reveal areas where the current workflows or policies need to be revised. Automating bad processes/policies doesn't make them better.)

Agent Involvement

For many callers, their experience extends beyond the IVR and continues after they have transferred out to a live agent. From the customer's perspective, their interaction with both the IVR and the agent are part of a single call, so these conversations need to flow together seamlessly. That's why involving agents in the overall IVR design and rollout is essential.

Agent involvement can be leveraged in multiple ways. First, due to agents' extensive experience talking with customers, they can provide unique insights into the needs and expectations of callers. Second, since many customers require or prefer human assistance, the end-to-end design needs to consider the transition when the call gets transferred to an agent (skills-based routing, screen-pop of data, etc.). This flow will only be successful if the agents' needs and usability have also been considered in the overall solution design. Additionally, agents have the ability to promote or undermine customer acceptance of the deployed VUI. If a customer could have completed some task within the VUI but instead opted out to speak with a human, the agent should encourage and educate the customer to use the automated system next time. By training agents on the functionality within the IVR, agents can coach customers

how to use it, and should be able to transfer them back into the automated system to try it again when appropriate. Conversely, if agents are not brought on board with the rollout of the new VUI, they may see it as a threat to their own job security and reinforce negative impressions of automation when speaking with customers.

There are several techniques for including agents positively in the VUI creation process:

- Clearly explain to agents the goals of the new VUI. If agents understand that the VUI is meant to supplement the agents' work (not replace them) and free them from the more mundane tasks, they will be more accepting of the new solution and how it relates to their own roles.
- Ask for their input regarding both caller and agent requirements.
- Provide training for agents on the new VUI and periodic updates as the VUI evolves over time.
- Agents should not re-ask for information that the customer already provided to the IVR and has been screen-popped through to the agent's desktop. If for security reasons agents are required to confirm this information, they should be coached on how to phrase this so it doesn't diminish customer confidence in the usefulness of the automated solution (e.g., *"I see here you already provided your account number. For security, I just need you to confirm the last 4 digits...."*).
- Have agents help test the solution prior to rollout.
- Throw a launch party with agents when the IVR goes live.
- If there are problems with the new solution, agents will be the first to hear about it. Make sure agents have a feedback loop, so they are able to take action by reporting what's wrong and suggesting solutions. This will empower agents when they do hear customer complaints about the VUI, and it will improve the solution over time.

Linking Siloed Channels

In today's multimedia world, customers often cross channels (web, phone, branch/store) and use different media (IVR, email, chat, fax, in-person, etc.) to achieve their desired goals. A single service session can be made up of multiple touch-points spanning channels and time. The challenge is that these channels are typically managed by separate departments within a company, and each siloed channel focuses on just their part of the user experience. All stakeholders need to work together to ensure the end-to-end customer experience fits together cohesively, particularly at cross-channel transition points. Additionally, designers need to stop thinking from the perspective of a VUI that interfaces with other media, and instead envision a meta-session that includes VUI, web, email, fax, etc. as parts of the holistic user experience.

Most organizations are internally siloed. There are separate business units running the marketing, online, contact center, branches and stores, field units, product management and development, back-office paperwork and mailings, etc. Often times, solutions for customers are designed from an "inside-out" approach. That is, the solution ends up reflecting the internal organization, which does not necessarily make sense to external users. Each channel (web, phone, in-person, mail, etc.) has been designed as a separate silo. But customers don't think of companies as a conglomeration of business units; to the customer, it's all just one company. Customers naturally cross channels – particularly in

situations involving more complicated processes, sensitive financial or personal information, or when trying to resolve issues. And the customer experience breaks down at these transition points.

Instead, what's needed is an "outside-in" approach. Namely, design the end-to-end cross-channel experience from the user's perspective. One of the best ways of doing this is through a technique called *User Stories*.¹ For example, the following story describes an end-to-end experience of a banking customer:

As a small business owner and high-value customer who does most of my banking online, I usually call into the bank only if there's an issue on my account. When I call in and identify myself in the automated phone system, I want the system to recognize there is an issue on my account and offer to transfer me to an agent who can resolve my issue. When the agent receives my call, they should know who I am and see the issue on my account, so I don't need to repeat myself.

User Stories allow cross-functional teams to discuss and refine the envisioned solution. Through this discovery process, *Epics* – large and complex stories, such as the example above – can be broken down into more detailed stories describing each of the sub-steps and sub-requirements which together enable this high-level experience. And these detailed stories can then be fed into the design process for each of the parts that together create this coherent end-to-end experience.

Of course, there are also many technical considerations in linking disparate systems across channels and organizational silos, which we won't explore here. But these technical requirements can only be well understood once the desired end-to-end user experience is mapped out. Without this more holistic vision and orchestrated design, each of these technical systems would be just another tactical point solution.

Cross-Team Empathy for User Experience

A strategic approach requires a cross-functional team working closely together to rethink the cross-channel customer experience and bridge these siloed channels. We're not proposing doing a re-org. But the task force assigned to this initiative needs to draw from a variety of specialties and business units. If there are certain lines of business that tend to work in isolation, now's the time to reach across those borders and begin to cultivate allies. Using a waterfall project methodology, where one business unit throws their deliverables over to the next team to run with on their own simply won't cut it anymore. Collaboration is absolutely essential to creating a unified and coherent end-to-end user experience.

The cross-functional team needs to have a shared empathy for and commitment to creating a better end-user experience. This often times requires not only process-change, but also cultural-change within the organization. Here are a couple of techniques which help build user empathy:

¹ Cohn, Mike. (2004) *User Stories Applied: For Agile Software Development*. Boston, MA: Addison-Wesley.

- Create *User Roles*, which are representative descriptions of different types of users of the solution.²
 - For instance, different profiles may be needed for:
 - a. A high-value, infrequent-contact customer (i.e., someone the business wants to speak to more)
 - b. A low-value, frequent-contact customer (i.e., someone the business wants to direct towards self-service or manage their contacts with more efficiently)
 - c. Etc.
 - User Roles provide the project team with a clear vision of the solution’s users. As designs and tradeoffs are made during the course of the project, the team can evaluate how those decisions will affect each type of user.
 - Also, User Roles can minimize intra-team arguments. Rather than debates being fueled by strong personal opinions, the team can ask one another: *“What do you think our high-value customer Mike would think about this experience?”*
- Use *User Stories* written from the end-user’s perspective (e.g., *“As a high-value customer who doesn’t contact my bank very often, I want/need....”*). Contrast this with typical *Functional Requirements* which might use language such as *“The system will/must....”* User-oriented language forces the team to think about how requirements will impact the user experience.
- Establish shared goals and success metrics directly tied to the user experience. Often times there are many competing business and technical goals. Goals for improving the user experience are often not given their due attention, and may not be shared across teams. Creating a superior user experience requires the commitment and incentive of the entire group.
- Involve the VUI designer early on in the presales process, as this is when project priorities and high-level functional requirements are typically defined. The VUI designer will be able to guide this discovery process, so the user’s perspective is not overlooked.

Case Studies

Below are representative case studies illustrating VUIs that have been designed as part of the broader user experience.

Bill Pay by Phone Solution

This solution was for European customers who pay bills by cell phone. Cell phone usage has deep penetration in Europe, and many customers prefer to conduct business on-the-go using their mobile phones. The VUI was designed to facilitate the upfront workflow for capturing the bill pay details (e.g., which bill, what amount, from which account, on what date, etc.). At the end of the process, the automated system needed to confirm that the bill pay request had been submitted. Rather than just

² *User Roles* are also sometimes referred to as *Customer Profiles*, *User Types*, or *Personas*. The term “Persona” is ambiguous, because it has different meaning across the VUI and broader User Experience communities. Within the VUI world, “Persona” refers to the description or caricature of the virtual voice of the recorded audio prompts within the system. Within the broader User Experience field, “Persona” is synonymous with “User Role” – namely, a representative description of a user of the solution (i.e., the caller).

doing this via the VUI, customers preferred to receive confirmation as a text message on their cell phone. It was easier to quickly visually scan this information, rather than listen to it. Also, once they received the text message, this was their written record of their payment.

Health Insurance Solution for Members

This solution was for members (patients) of a U.S. health insurance company. The original vision was to create a self-service VUI for members checking on their medical coverage and claims status. However, early conceptual interviews with members revealed there were only a few type of calls for which the member would be satisfied using only self-service. For many calls the member would want to speak with a human who could clarify their policy benefits and explain why a particular claim was being denied or not covered in full. At the same time, these members said they would be willing to use a VUI for partial-call automation, as long as they could be transferred to an agent if they needed one. Namely, they liked the idea of being able to provide the automated system with some information upfront (e.g., multi-step identification process for HIPAA compliance, the claim date or claim number, etc.), and then when they transferred to an agent, having all the data they had provided in the VUI screen-popped to the agent's desktop so members would not have to repeat themselves.

This solution required a cross-team effort, because it involved re-envisioning the main purpose of the solution, revising the business case based on the value of partial-call automation, designing the VUI based on this flow, updating the agent desktop to incorporate more robust screen-pop, and training agents to efficiently handle calls in which the member has already provided a significant amount of data through the automated system.

The results were extremely successful. Post-interaction surveys and interviews revealed that both members and agents were satisfied with this new approach. And the solution ended up shaving an average of 15~20% off the average handle time per call.

Health Insurance Solution for Medical Providers

Another project was focused on creating an automated VUI for medical providers (doctors' offices, hospitals, etc.). Client team members did ethnographic research in providers' offices to find out about providers' workflow. This solution involved not just the VUI, but another important channel for these users – namely, the fax. Users preferred different channels depending on the type of task they were doing – checking benefits or claims. It is also important to distinguish different types of User Roles for this solution. Large medical organizations tended to have many patients for whom they were checking on benefits and claims. So these users wanted just a brief summary over the VUI, and then receive a fax with the long list of details. Smaller medical providers, with fewer patients, preferred to hear more of the information over the VUI, and then the option of receiving a fax.

By understanding what was important to which users, the VUI flow could be designed in a more adaptive and customized way. If only one generic VUI flow were created for all users and situations, it would not have satisfied these users' needs.

TV Service Technical Support Solution

In this solution, customers of a TV service were calling into a technical support center. Usability testing with customers in a lab that looked like a living room revealed a number of challenges that the VUI design needed to take into account:

- Customers were typically in a state of heightened emotional arousal when they called, because they were already having technical challenges with their equipment.
- The automated system needed to lead the customer through a series of steps, and conduct diagnostic tests which the TV service provider can automatically run to determine what is wrong with the system. The VUI designer needed to understand what these steps were and what the customer would be seeing, so the VUI could explain this process to the caller step-by-step.
- Customers were often looking at the TV screen, turning their heads away from the telephone receiver. So, at times it was difficult for the speech recognition to pick up the caller's utterances.
- The VUI needed to instruct the customer to press certain keys on the remote control. Field observations revealed that customers often got confused. Some would be using the wrong remote control – the one for their TV, rather than the one for the cable equipment. Some would try pressing a button on the phone handset keypad, rather than on the remote control. Or some customers would point the remote control at their TV screen (where they were looking), rather than at the cable box. Customers didn't always realize which remote control was for which device, or how the remote control signaling works.
- Because of all of the variables, customers were quickly overwhelmed by technical details. It was crucial to minimize the number of instructions, and only tell the caller the most important information they needed to know at any point in time.

Conclusion

To create better VUIs that satisfy true user needs, we as VUI designers need to acknowledge the VUI's place in the food chain. The VUI is not the center of the world – it is part of a larger technology world and part of the user's broader world. The VUI needs to work as an integrated step within the end-to-end user experience; otherwise, the VUI won't work. The more open-minded designers can be about choosing the right technology for the task, the better it will be in the long run – for the end-user, for business clients, and for the growth of speech technology itself. Often times, a big impediment to tying technologies and cross-channel experiences together are the silos within the business's organization. We need to collaboratively overcome disparate technologies and competing agendas. Moving forward, speech needs to be part of the next wave of Multimodal – using all technology available in an intelligent, integrated way. It's time to tear those silo walls down. So take your VUI out of its box, and let's start fitting the puzzle pieces together.