

HoldUp: Rethinking IVR Systems for a Digital World

INTRODUCTION AND CONTEXT

When was the last time you called a company—for information, customer service, or something else—and had a great experience using their automated phone menus and waiting on hold? If you said “never,” you’re not alone. New technologies and a renaissance in user experience design have revolutionized many facets of our lives, but today’s Interactive Voice Response (or IVR) systems are scarcely better than those in use decades ago.

Today’s IVR systems frustrate their users with long, byzantine menus. Users must wait as a recorded voice reads the options at each menu level, not daring to choose before all the options are presented lest there be a better choice ahead. As each option is narrated, users must remember all the options that preceded it. If they select the wrong option, they must figure out the command to navigate back to the previous menu. When users need to input detailed information such as a name or address, they are limited to using a 12-button keypad or repeatedly dictating the information until it’s transcribed correctly (either by buggy voice recognition software or a call center representative). And if an interaction with the IVR system is interrupted (e.g. by a dropped call), users are forced to start over from the very beginning.

These flaws illustrate a large social-technical gap between users’ social needs and what is supported technically, leading to frustration with today’s IVR systems (Ackerman, 2000).

Users transfer those negative emotions to the organizations they’re contacting, leading to tense

interactions with call center personnel, lower customer satisfaction, and less repeat business. And yet, despite tangible damage to their bottom lines, virtually every large organization uses an IVR system in some capacity, because they've calculated that the cost savings from replacing live personnel with IVR systems exceed the revenue loss from frustrated customers.

What if we could build a system that benefits both stakeholders—the organizations and their customers? Most organizations strive to make or save money, whether by reducing operational costs (e.g. by hiring fewer call center personnel) or increasing revenue (e.g. through repeat business driven by higher customer satisfaction). Meanwhile, for users, the goal is to successfully complete their interaction with the organization, whether by solving a technical problem, making a change to their account, purchasing a product, or something else. These goals are not mutually exclusive; in this paper, we propose a system that achieves both.

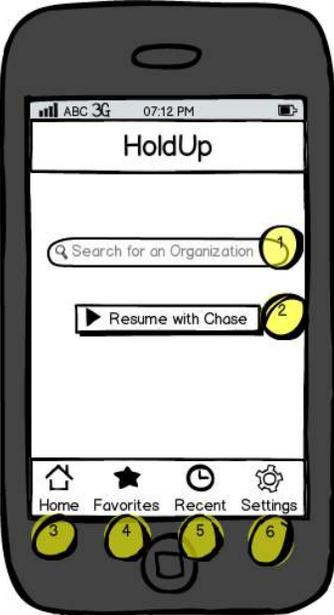
Our design is based on the computer-mediated communication (CMC) competence model, proposed by Spitzberg and simplified by Bubaš. The CMC competence model is comprised of three phases—user competence, factors, and outcomes (see Figure 1 in the Appendix)—which guide the design process by dictating the user and contextual factors to consider and how to determine the success of the design via outcomes (Bubaš, 2001). Using these tools, we have created a system that narrows the social-technical gap in IVR systems.

We propose a smartphone application framework organizations can use to enable their customers to conduct IVR interactions via simple on-screen menus and standardized navigation. Users can input information on their smartphone keyboards, pause and resume interactions, and leverage multimedia like photos and videos to accomplish their intended tasks. Should they

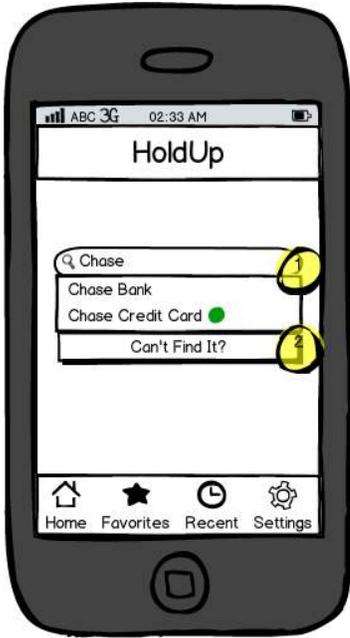
need to speak with a live call center representative, users can easily determine hold time and hours of operation, or even choose to have someone call them later instead of waiting on hold. We call our system HoldUp—as in, your time waiting on hold is up—and it is targeted at American iPhone owners with moderate technology literacy, though it could easily be adapted for other cultures and smartphone operating systems.

PROPOSED SOLUTION: WIREFRAMES

We created wireframes using Balsamiq, a tool for creating low fidelity mockups, to demonstrate how customers would interact with our mobile app in an example scenario of notifying Chase that they will be traveling and using their credit card internationally (a task which currently requires calling Chase on the phone and using their IVR system). This scenario illustrates most, but not all, of the key features of HoldUp. Please note that while the user interface we have illustrated is our own creation, we did not attempt to redesign the menu structure, which is based on Chase’s existing phone-based IVR system.



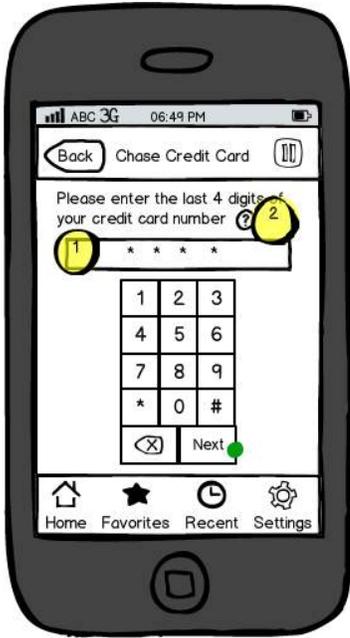
- 1 Allows users to search for an organization
- 2 If user has previously paused interaction, this button will take them to where they last left off. If user does not have a previous interaction, this button will be disabled.
- 3 Home icon will take users back to the main screen
- 4 Favorites icon will take users to a list of their favorite companies
- 5 Recent icon will take users to a list of recently dialed companies
- 6 Settings icon will take users to their settings options



- 1 While user is typing the company they would like to contact, the results will auto populate.
- 2 If the company they are looking for is not there, they will be directed to a screen where they can browse companies.



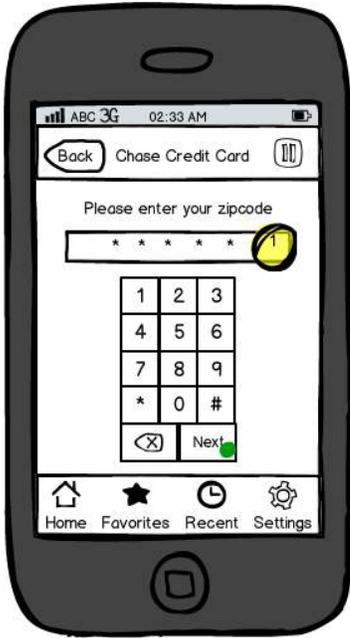
- 1 If customer is new to Chase, will take customers to a "new customers" set of menu options
- 2 If customer is an existing Chase customer, will take customers to "existing" customers menu options



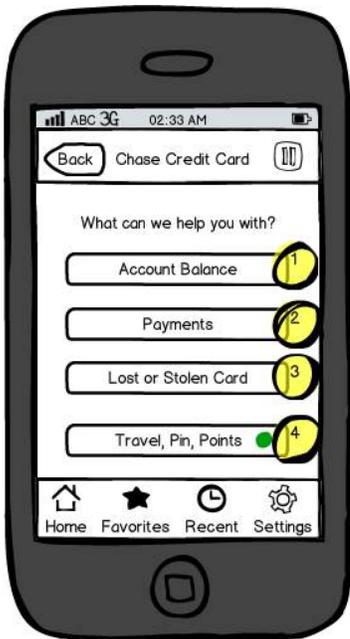
- 1 Customers enter in the last four digits of their credit card to pull up their account.
- 2 If users are confused, they will be able to access additional interactive multimedia help



- 1 Screen is shown after user has pressed the "?" icon to help demonstrate what information is needed of customers.



1 Customers enter in their zipcode to pull up their account.

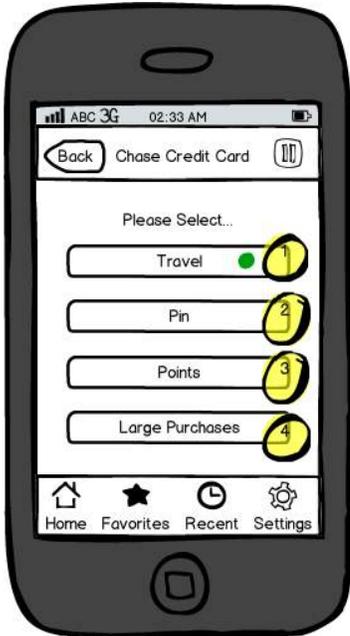


- 1 Customers can access their account balance.
- 2 Customers can access their account payments.
- 3 Customers can report a lost or stolen card.
- 4 Customers can access their travel, pin, and points information.



- 1 If user has been:
- Idle on the screen for 20 seconds
 - Going back and forth between screens
 - Shaking their phone

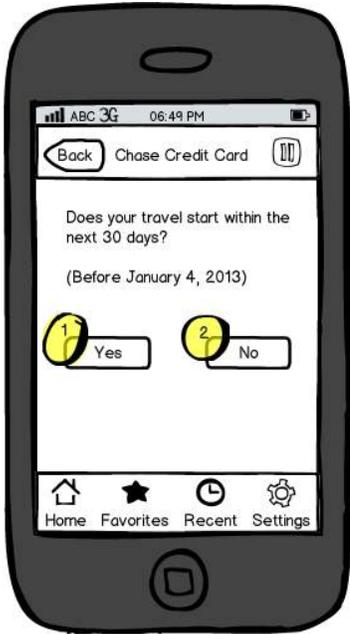
An overlay will show up, and users will be able to contact a representative.



- 1 Customers can alert Chase about travel plans.
- 2 Customers can change their pin number.
- 3 Customers can receive information on their reward
- 4 Customers can alert Chase about upcoming large purchases.



- 1 For added security measures, customers will be required to enter in the first three letters of their mother's maiden name.



- 1 Customers choose this option if their travel plans are within 30 days
- 2 If their travel plans are more than 30 days away, they are taken to the customer representative screen.



1 Customers input the start date of their travels.



1 If the customer had indicated their travel plans are more than 30 days away, they will be taken to this screen if they have questions or if they need further assistance.

2 Indicates the amount of wait time.

3 Customers can call representatives.

4 Customers can also have the company call them back within the wait time.



1 Customers are taken to the dialer to call the representatives.

PROPOSED SOLUTION: EXPLANATION

HoldUp introduces several key improvements over conventional IVR systems, offering a faster, easier, more helpful user experience. As a result, it reduces the length and frequency of interactions between users and call center personnel, though it does not eliminate these interactions entirely (even with modern technology, some issues are best resolved by a real human being). And while HoldUp focuses on the user experience before any interactions with call center personnel begin, it also offers features which enhance those interactions.

Let's discuss some of the key features HoldUp introduces to improve upon conventional IVR systems. First and foremost, the visual menus let users easily navigate the system just as they would in other smartphone apps. Users can see all their options at once (displayed in the language they're most comfortable reading), consider them as long as needed, and move backwards and forwards through the menus with ease. This leverages the strengths of, and meets users' expectations for, the smartphone app medium (Spitzberg, 2006). All of these

benefits reduce the user's mental workload and make the system feel more familiar and friendly, decreasing users' anxiety and increasing their efficacy. According to the knowledge portion of the CMC competence model, this will increase users' motivation to use the system (Spitzberg, 2006). Meanwhile, organizations can largely preserve their existing menu structure and transpose it to the app, reducing the cost of adoption.

To make it easy to contact organizations, we provide a search directory on the main screen of the app. Users can bookmark their favorite organizations and view the organizations they've contacted most recently for quick access. The multimedia features of HoldUp provide images, videos, and more to help users understand what they need to do; for example, when troubleshooting a computer problem with tech support, users might be shown illustrations clearly indicating the buttons they need to press. Instead of trying to convey complex information like names and addresses using flawed voice recognition software or a 12-button keypad, users can type on their smartphones' full QWERTY keyboards. These features, which are based on the knowledge portion of the CMC competence model, help users feel more naturally competent with the system, thus increasing their satisfaction (Spitzberg, 2006).

The CMC competence model also emphasizes the importance of understanding the context in which a CMC system will be used (Spitzberg, 2006). Several of the features we've already mentioned support users' real-world usage contexts, such as saving favorite and recent organizations for quick access, and using visual navigation and non-verbal input to enable the system to be used in public or noisy environments. However, perhaps the best example of how HoldUp supports real-world usage contexts is a button that allows users to pause and resume interactions. If a user is interrupted while interacting with a conventional IVR system—say, by

an incoming phone call—they must hang up, then restart their interaction from the beginning later. In contrast, HoldUp enables users to quickly pause their interaction so they can pick up where they left off. Per Spitzberg’s model, these features should decrease anxiety and increase users’ feelings of competence in using the system, leading to higher satisfaction.

Should users need to talk to a live representative for more help, HoldUp improves that experience too. Our design clearly shows the hours during which the call center is open (and won’t let users waste their time initiating a call if it’s closed), and also shows the projected hold time so users can decide when to call based on their own schedules. We even provide a callback feature whereby users can skip waiting on hold and have the organization call them when a representative is available. These features are based on the context portion of the CMC competence model, motivating users to use the system by accommodating their personal schedules and needs. HoldUp also exploits the strengths of the smartphone app medium to make interactions with call center representatives feel more personal by displaying the name and photo of the rep a user is interacting with (Spitzberg, 2006).

CONCEPTUAL VALUE

While Ackerman acknowledges that the social-technical gap is ever-present, he notes that we can attempt to better understand and approach the gap (Ackerman, 2000). In HoldUp, we pursued the objective of providing a simpler, easier way for users to interact with IVR systems. To help guide our design, we used the principles of the CMC competence model and its three phases—user competence, factors, and outcomes (Bubaš, 2001).

We began with the user competence phase, which incorporates users' motivations, knowledge and skills. We designed HoldUp to build upon the way users and organizations already interact with IVR systems. We are not dramatically changing the way users navigate customer service menus or how businesses structure the automated portions of their IVR systems; we are simply providing an alternative navigation tool that takes advantage of today's smartphone technology. HoldUp's design incorporates elements from current IVR systems and popular smartphone apps, so users will immediately feel a sense of familiarity. However, it also leverages technology (such as pause/resume and visual menu navigation) to bridge the gap between users and the system and make them feel competent and empowered.

Next we looked at the factors that affect our design. This phase of CMC competence focuses on the medium, message and context. As a mobile app, HoldUp can provide a more dynamic user experience than a conventional IVR system, with features that aid communication between users and call center personnel (like enabling personnel to push rich multimedia to users to help illustrate concepts). We considered the context in which our application is used and chose features that enable HoldUp to better fit users' lifestyles, whether they are short on time or in a public environment (such as allowing users to pause and resume interactions).

Finally, the outcomes phase of CMC competence helps us determine the success of our design and the benefit of our app to the user by considering efficiency, understanding, appropriateness, and satisfaction. As mentioned previously, we introduce features that help users accomplish tasks with less time and effort, like a searchable company directory and displaying the projected hold time for a call. We always want our users to accomplish their goals, whether through the automated system or by talking to a call center rep. In our example

scenario, a user could successfully use HoldUp to let Chase know that she will be traveling. But in the case where the user's travel plans are more than 30 days away, which Chase does not support through the automated system, we provide the option to speak to a representative. The current Chase IVR system does not make this option easy for users to find.

CONCLUSION

In HoldUp, we applied technology and user-centered design to solve a current CMC problem. The CMC competence model drove the design and evaluation of our product, ensuring that we are indeed narrowing the social-technical gap between IVR systems and users. IVR systems have barely changed since their inception, and HoldUp is a vast improvement in the way users engage with organizations' support personnel. We hope HoldUp can help both users and organizations achieve their desired outcomes more effectively than the status quo.

REFERENCES

- Ackerman, M. S. (2000, September). The Intellectual Challenge of CSCW: The Gap Between. *Human-Computer Interaction, 15(2)*, 179-203.
- Bubaš, G. (2001). Computer mediated communication theories and phenomena: Factors that influence collaboration over the Internet. *3rd CARNet Users Conference*. Zagreb.
- Spitzberg, B. H. (2006). Preliminary Development of a Model and Measure of Computer-Mediated Communication (CMC) Competence. *Journal of Computer-Mediated Communication, 11(2)*, 629-666.

APPENDIX

Figure 1. – Computer Mediated Communication Competence Model (Bubaš, 2001)

