

Mobile PICOLA: One Step Closer to the Future of Deliberative Polling

Introduction

Our HCI Mobile PICOLA design team spent the past semester analyzing and redesigning an application that allows users to participate in a deliberative poll discussion when they are not able to physically attend. During the first weeks of the semester, we looked at how group discussions are handled in business meetings, both remotely and on site. While one of the key findings we pulled from this experience is that people are motivated to moderate themselves when their jobs are on the line we found that in the deliberative poll discussion, the moderator was more active in guiding participants to remain on topic.

In addition to looking at these situations, we also employed several usability inspection methods to evaluate the current Mobile PICOLA design. Each member of our design team independently evaluated the interface, generating a combined 52 unique usability aspect reports ranging from catastrophic connection and visibility concerns to minor consistency and standards point problems. Heuristic evaluation also allowed us to identify several system bugs and prepare a report of these to aid in the development of the next iteration. These methods also were useful in pointing out good aspects of the interface that we recommend remain unchanged

We performed keystroke-level modeling (KLM) analysis of task time for logging in, text chatting “hello world,” and adding oneself to the speaker queue. We used our findings to confirm that our redesign does not add more time to the task once a user becomes a “task expert” in chatting or speaking to the group.

Following KLM, we conducted cognitive walkthrough analysis. This subjective method lets us look at what might happen when a typical user performs tasks using Mobile PICOLA. We made a priori claims about the user and compared our assumptions about how the user would handle the task with the correct actions. From this, we generated several hypotheses to look at during think aloud user testing.

We conducted think aloud testing with five users ranging in age from 20 to 60 years old. Their experience with technology ranged from the very basic word processing and internet usage to software and hardware engineers. The results of testing confirmed many of the concerns we drew from other usability methods and encouraged us to come up with a design that would resolve many of the problems we found.

Our team was inspired by looking at all the data from every angle and from this, we created a redesign that resolves more than 70% of the major problems and 80% of minor and cosmetic problems identified during analysis this semester.

Logging In

Through a heuristic evaluation of the Mobile PICOLA login screen, our design team was able to identify several major problems that users might encounter when using the software. We found that there was little affordance for the user to recognize a way to enter text. (srk-HE-01, srk-HE-03) Cognitive walkthrough analysis helped to substantiate these findings (CW-01, CW-02), but it was think aloud user testing that showed that, particularly with older users, recognizing the keyboard icon as a way to enter text was not intuitive. (fa-TA-02, srk-TA-03) The sample of think aloud users tested ranged in age from 20 to 60 years old. While younger users were quick to identify the icon (fa-TA-03, rm-TA-01, srk-TA-01), the older users looked for either an external keyboard attachment or label-based indication of the next step. This difference in results was surprisingly not based on the technology familiarity of users as one of the older test users has worked as a software engineer for many years.

There was one consistency between the sample of five test users. None were familiar with a Palm Pilot or other PDA brand. We did not identify any problems with using the stylus as a pointing device, but many problems related to visibility of information and navigation issues.

Our redesign of the login screen was inspired by our heuristic evaluation and think aloud user test results. (Fig.1) We particularly concentrated on making the login screen quicker, and more intuitive to use. Heuristic evaluation showed that users may have difficulty remembering both a username and conference identification when logging in. (fa-HE-12, srk-HE-06) Because users may only be logged in to one conference, we felt that an appropriate solution would be to request just a login ID at the entry screen. In addition to preventing problems with recall, it will also help to prevent login errors due to mistyping a conference identification, reducing the related potential errors by up to 50%. (this change was substantiated by the project sponsors/developers who alluded to the back end already supporting this?)

During think aloud user testing, we witnessed users looking for a visual indication or label letting them know how to enter text. Adding a simple label directing them to the keyboard icon provides a quick affordance gain for this task. (Fig.1,2) Other ideas we considered related more to problems with the Flash software and handheld device. Instead of trying to resolve issues that may be outside the scope of Mobile PICOLA, we felt that this small change would be enough to alleviate most of the frustration users encountered at this stage.

To resolve concerns related to login time and visibility of system status, we implemented a status screen. (Fig.3) After the user taps the enter button, a pop-over window displays the connection and login status. If there is a delay with the network, the user will still be able to see that progress is being made toward logging in. Concerns that the user may have about the program not working would be alleviated.

Roundtable Discussion

Significant problems were identified during heuristic evaluation, cognitive walkthrough, and think aloud user testing related to visibility. (rm-HE-11, srk-HE-01, srk-HE-07, fa-TA-02, fa-TA-06, srk-TA-05) Because keyboard access comes from the Flash player controls, after logging in to Mobile PICOLA, a user will see an obstructed view of the roundtable discussion. The emoticons button is completely blocked, as well as part of the drop down menu at the top right of the screen.

To address this, we feel that there are two potential solutions. One would be to offer Pocket PC training for novice users before using the software. Teach them how to change back and forth from full screen mode and to use the keyboard pop-up. Although we recommend this, we feel it would be a more reliable result if the program were designed to account for the taskbars at the top and bottom of the screen. The user never has to enter full screen mode, so errors related to that would be eliminated. The trade-off to this change is also significant. Screen space is at a premium. It will be difficult to come up with a final design that works in the smaller space but is still readable and functional.

Other changes we made included a stronger visual representation when a participant is speaking. (Fig.4) The speaker's icon will turn from orange to blue and a speaking graphic icon will appear. (rm-HE-12) As the person speaks, the icon grows and shrinks to show that it is active. The user logged in, if he is in the queue, will see the number of his placement within the queue in his icon. This will allow the user to keep track of their place in line when they do not have the speak tab extended. When the speaker changes, the speak tab will also flash briefly to additionally demonstrate a change. (srk-HE-21, rm-HE-07)

For the user next in line in the queue, their number in the icon will flash to let them know when less than 10 seconds remains so they may prepare to speak to the group. (fa-HE-23) When text chat is active with messages the user hasn't seen, the tab flashes.

Tabbed Interface

One of the most significant problems we encountered during evaluation of this program was that it was difficult to navigate to the text chat and speaker queue screens. We developed a failure hypothesis during cognitive walkthrough (CW-03, srk-TA-05), and think aloud testing confirmed our suspicions, where 100% of users had major breakdowns in trying to find where in the program they could speak or text chat with other participants. (rm-TA-02, fa-TA-04, rm-TA-05) In trying to text chat or speak to other users, many of our think aloud participants tried to tap either their own icon or that of others in the group. We addressed these problems in several ways.

Our most significant visual and navigational change to Mobile PICOLA was the introduction of a tabbed interface. (Fig.4) Instead of a drop down menu that may go unseen or unconsidered, two large tabs to the right of the screen are visually prominent enough to grab a user's attention without dominating the space devoted to the roundtable. Screen labels, "text chat" and "speak" provide an affordance for the user to quickly find where to go when they want to use these features. Because our cognitive walkthrough hypothesis, as well as users in our think aloud studies had difficulty with the

word, “queue,” (CW-03) we felt it was important to try to reflect what the user’s goal would be in renaming the screen “speak.” We added small arrows to each tab to provide additional affordance for users not familiar with tabs. This will aid in understanding that tapping the area will expand a space on the screen.

Moderator

Some changes we made were influenced by what we witnessed during a live deliberative poll discussion. The design team agreed that the moderator made an obvious effort at blending in with the group, sitting amongst them, occasionally providing some direction. We felt that although it is important for it to be clear who the moderator is, having an icon more similar to the regular participants, and placing it within the roundtable oval was important to establish what we saw in the live session. (Fig.4)

Emoticons

One of the small changes we made to the screen relates to the emoticons. To provide more room for the roundtable and the frame within it, we moved the emoticon change dropdown to within the user’s icon. (Fig.4) A small arrow provides the affordance that it can be tapped. Heuristic evaluation showed the small problem that some of the icons appear a different color in the list compared to when active in the user’s icon. (fa-HE-07, srk-HE-28) The design team recommends consistency during the next iteration of the interface.

Help System

Replacing the drop down menu at the top of the screen are help and exit buttons. We feel that icons would be just as acceptable as text based button labels, but regardless, we emphasize the importance of a help system. All of our think aloud users had catastrophic problems that led them to either quit or accidentally leave the system. Most actually looked for some help system on the screen. We recommend the addition of this tool as a way for users to have either a direct link to the moderator, or static feedback look up for problems during the use of the system.

We added a small help icon next to the login text field. We found through heuristic evaluation, that the lack of a help system is a catastrophic usability problem. (fa-HE-03, fa-HE-22, srk-HE-25) We discuss this in more detail later in this report, but in relation to the login screen, if a user has forgotten or misplaced their login ID, having a quick way to find retrieval help is important. Our design team recommends that when a user taps the help icon at the login screen, a technical assistance phone number is displayed, as well as a login ID website retrieval address.

Exiting Mobile PICOLA

Because of a bug in the system, the Mobile PICOLA application did not refresh after a user exited the discussion. It was several minutes before the user would appear to themselves or other participants as being logged out. This problem has two major points to address. First, when users exit the discussion accidentally, they are not given any warning that they are leaving the discussion. Second, because the screen does not change after exiting the discussion, users may still think they can communicate with the group.

To resolve this problem, we recommend an exit confirmation screen. Although users will have to take one additional step when leaving the discussion, this will help prevent accidentally exiting by asking users if they really want to exit. Our design team also suggests that the user be immediately taken back to the login screen after confirming their exit from the discussion. The system should refresh the roundtable to be sure all other participants are aware of the user's exit.

Text Chat

The current text chat layout is arranged so that users enter a line of text at the top of the screen and their message is appended to the bottom of the second text field. This does not afford users to quickly see that their message has been sent and makes it more difficult to recognize when new messages arrive. (rm-HE-15) Although we cannot assume that Mobile PICOLA users will be familiar with current internet chat programs like AOL Instant Messenger and MSN Messenger, we did draw from that style and changed the PICOLA text chat layout.

In our new design, we made two major changes. As mentioned previously, the first consists of putting the text chat in a tabbed window that expands across the top of the screen. (Fig.6) This allows the keyboard to be fully extended without blocking any part of the text chat window. The second major change is the rearrangement of the text fields on the tab. The user now enters text at the bottom of the tab and this is appended to the bottom of the chat field. Like in other chat clients, this allows the user to immediately see that their message has been received, as well as any responding messages, without drawing their eye away from where they were typing.

Speak Tab

With the speaker queue, in addition to relabeling it to "speak," we also increased the size of the buttons and put them in a more prominent location on the tab. During cognitive walkthrough, we found that the "ask to speak" label was already a strong match to real world language, confirming this during think aloud user test analysis. (Fig.5) We recommend this label not be changed in future iterations of Mobile PICOLA.

We do recommend, however, that users have an allotment of ten jump ahead turns. During the live deliberative poll discussion, a key communication between users was quick supporting comments. In order to keep the mobile version as close to the real thing as possible, but still implementing a queue, having more chances to jump ahead will be important. We found during heuristic evaluation that there was a strong chance that users may tap the jump ahead button by accident. While we hope our redesign resolves most of those cases, we still feel that being able to remove a jump ahead turn before it is used, restoring the number in the user's allotment will be crucial. Because there is a limit to the number of times a user may jump to the beginning of the queue, having the ability to restore any jump aheads not used will allow the user to feel they have more control over their participation in the discussion and will allow good recovery for errors.