



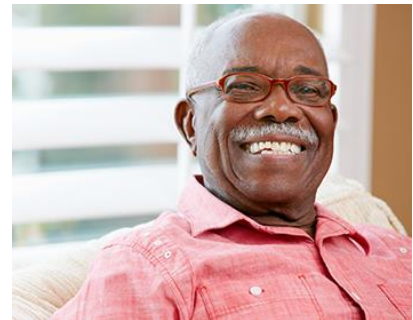
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Making Mobile Devices More Accessible

By: [Robert Felgar](#)

In a world increasingly focused on equity and inclusion, mobile devices play an important role in helping people with intellectual disabilities stay connected with friends and family. Enabling these individuals to participate in mobile communications, however, demands that we pay attention to their special requirements. In 2020, RAZ Mobility introduced the first mobile device—the RAZ Memory Cell Phone—designed specifically for individuals with intellectual disabilities, especially dementia.



In the early stages of Alzheimer’s dementia, a person can continue to use their smartphone or feature phone without much difficulty. As the disease progresses, however, the complexity becomes too difficult for them to manage. They will change device settings that they should not change, purchase items that they should not purchase, open the wrong applications, forget how to edit contacts, have difficulty with multi-step processes, and more. Accessibility is about overcoming these limitations and challenges and allowing these individuals to benefit from mobile communications despite them.

Focused on accessibility

The number of people affected by dementia, including Alzheimer’s, is large and getting larger as the population both grows and ages. According to a [special report](#) by the Alzheimer’s Association titled, “2021 Alzheimer’s Disease Facts and Figures,” an estimated 6.2 million Americans are living with Alzheimer’s dementia in 2021. In 2050 the number is expected to grow to more than 12 million. The report explains that 11 percent of individuals over the age of 65 have Alzheimer’s dementia, and 34 percent of seniors 85 and older live with the disease.

The statistic, though, that really brings home the magnitude of the problem is the lifetime risk for developing Alzheimer’s dementia, which at age 45 is approximately one in five for women and one in 10 for men. Many of the readers of this article will unfortunately experience dementia.

By contrast, the risk that a person will become permanently blind sometime during their lifetime is comparatively small. According to a 2017 [study](#) conducted by Deloitte Access Economics, titled “Incidence and Risk of Sight Loss and Blindness in the UK,” the lifetime risk from birth of permanent blindness in the UK is four percent. Yet accessibility efforts with respect to blindness have far outweighed comparable efforts for people with intellectual disabilities, especially dementia.



Figure 1 - Images of the RAZ Memory Cell Phone

As dementia progresses, patients will eventually be unable to use a standard phone. Accessibility for these individuals means providing them with the ability to continue to stay connected with family past the time at which they otherwise could with a normal device. Of course, users with intellectual disabilities are the primary beneficiaries of an accessible device. But families and caregivers also benefit. According to the 2021 Alzheimer’s Disease Facts and Figures, there are more than 11 million unpaid caregivers in the United States who take care of people with dementia. Wireless carriers also benefit, as users stay on their networks for a longer period.

Making the RAZ Memory Cell Phone accessible

The RAZ Memory Cell Phone follows three key design principles: 1) the user is locked into a very simple environment, 2) the settings and features of the phone are controlled by the caregiver

through an app or online portal (as such, they are not controlled by the user), and 3) the decision of whether to allow the user to access additional features and capabilities is made by the caregiver, and the features are always optional so that the level of complexity can be tailored to the user’s capabilities. Each of these principles will be discussed in turn.

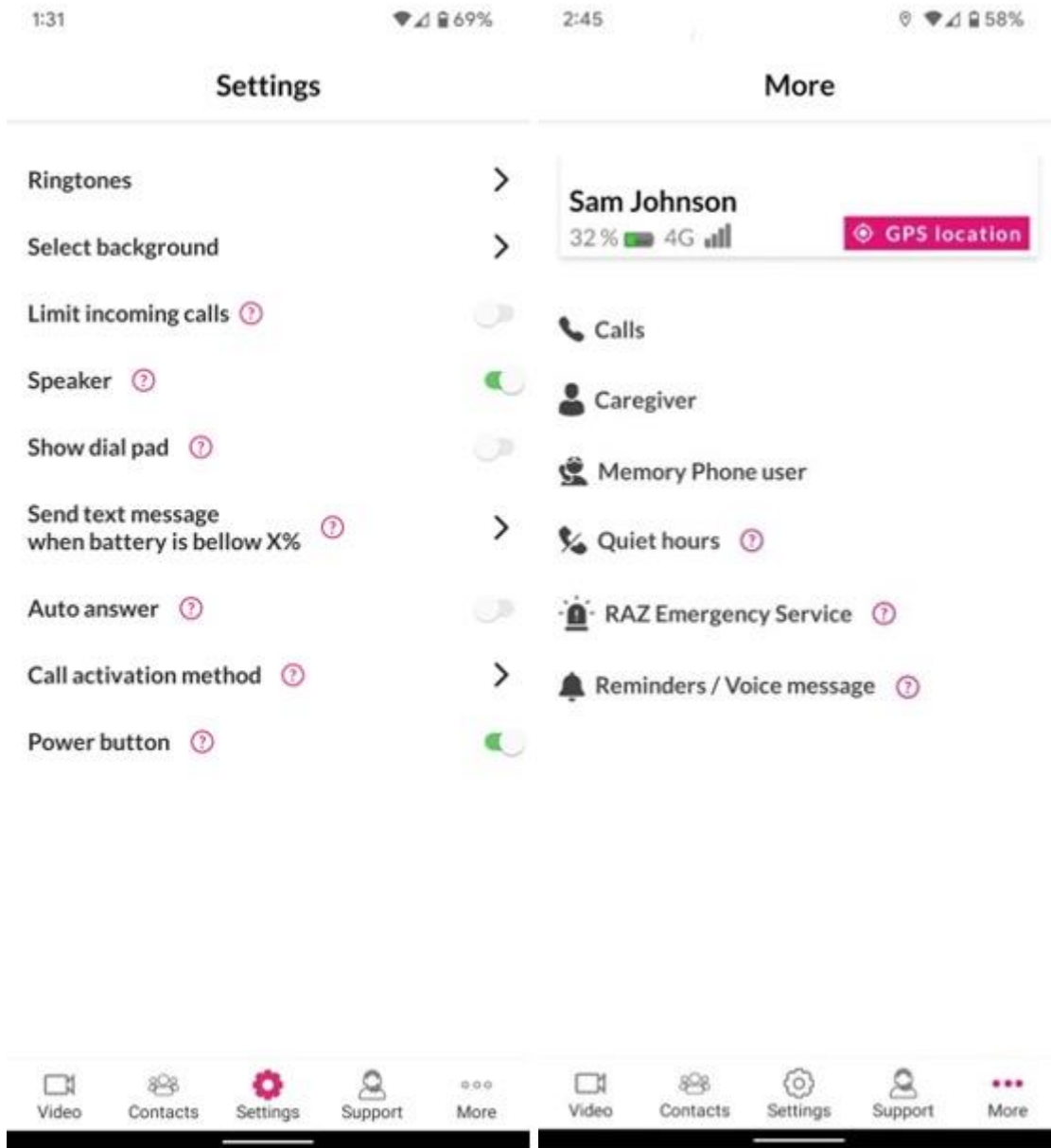


Figure 2 - Images of the RAZ Care App, which the caregiver uses to control the RAZ Memory Cell Phone

The user is limited to a very simple environment, which they cannot exit. People with intellectual disabilities have differing capabilities. Some, especially those with more advanced dementia, will find almost any level of complexity extremely challenging. The need for simplicity must be the pre-eminent design consideration. As a result, by default, users of the RAZ Memory Cell Phone are limited to one screen. The screen has pictures of contacts with names underneath. To place a call, the user simply presses a picture. The volume rocker is disabled (volume is always set to

maximum), the display never goes dark, the user cannot access settings, there is no lock screen, there is no home screen, and there is no scrolling or swiping. Even the power button can be disabled. In the event of an emergency, the user presses a red button at the top of the screen. The user does not even have to dial the digits 9-1-1.

To accommodate the reality that most users of the RAZ Memory Cell Phone are not capable of managing the phone settings and other device features, these capabilities are managed remotely by the caregiver through an online portal or an app on the caregiver's own phone. For example, the caregiver manages the contacts that appear on the RAZ Memory Cell Phone. This remote management is a critical and necessary design feature of any device intended for use by people with intellectual disabilities. Family members often do not live close to their loved one with dementia. Thus, the ability to manage the phone remotely is key. And as mentioned, users are often not capable of managing the phone themselves. For example, expecting the user to upload pictures into contacts is unrealistic in many cases. The caregiver, not the user, must control contacts, settings, and other device elements.

The final important design principle makes the more complex features of the RAZ Memory Cell Phone optional. For example, for some people with intellectual disabilities, scrolling is difficult. To accommodate this limitation, by default the phone is limited to six contacts, who appear on only one screen. However, if the user is more capable, the caregiver can activate an option for up to 30 contacts, which requires scrolling. An additional example is a dial pad. While many users of the RAZ Memory Cell Phone cannot handle a dial pad, some can. In such cases, the caregiver can activate the dial pad feature from the online portal or app. For everyone else, a dial pad does not appear. Making the default nature of the phone extremely simple, and all additional features optional, guarantees accessibility to those who require the utmost simplicity, while accommodating individuals who can handle greater complexity.

Features of the RAZ Memory Cell Phone

The RAZ Memory Cell Phone has several features and capabilities that can be activated by the caregiver through the online portal or app. Most of these features address challenges faced by individuals with intellectual disabilities. Just about all of them were developed in response to customer feedback.

Listening to customers and learning about the unique needs of people with intellectual disabilities, especially dementia, is critical. Using intuition to ascertain beneficial features is simply not sufficient. For example, some users have the habit of holding the phone out in front of them, rather than to their ear. To address this, caregivers can select an option for all calls to go to the speaker, rather than the earpiece. Absent feedback, we would never have known, or even suspected, this behavior. Many forget to charge the phone at the end of the day. We tackle this challenge by providing the caregiver the ability to check the phone's battery strength in the app or online portal. The caregiver can also elect to receive a text message when the phone's battery strength hits a certain threshold, say 20 percent. There is also an option to automatically answer incoming calls. If activated, the user does not need to press the Answer button for the call to connect. This feature assists people with more severe intellectual disabilities who may not

reflexively press Answer when they receive a call. For users who are vulnerable to telemarketers and fraudsters, incoming calls can be limited to calls from contacts.

Two recently introduced features include the ability to send the user reminders, and the ability to prevent the user from placing outbound calls during certain time windows, designated as “quiet hours.” This feature was developed after a customer told us that his father loved the phone but was now calling him repeatedly during the workday. The “quiet hours” feature allows the caregiver to restrict the user’s ability to call during certain times of the day, such as the middle of the night, which can be a problem if the user is frequently confused by time of day.

These features address the pain points experienced by both users and caregivers, allowing people with intellectual disabilities to stay connected with family members even as their condition deteriorates.

The future of the RAZ Memory Cell Phone

Remote health monitoring via wearables works very well for most Americans. Many seniors with dementia and other serious intellectual disabilities, however, cannot operate a smartwatch or other wearable. In 2022, RAZ Mobility will use the RAZ Memory Cell Phone as a platform from which caregivers can remotely monitor the health of their loved one. The principles of simplicity and ease-of-use that the RAZ Memory Cell Phone uses to enable telecommunications will also be used to facilitate health monitoring. The objective is to deliver health and wellness services in ways that will allow people who otherwise cannot benefit from such technologies to do so.

At the same time, RAZ Mobility will continue to further develop features that will make it easier for people with severe disabilities to use telecommunications and stay connected with family. With more than six million Americans living with dementia, and approximately 11 million family members caring for these individuals, making mobile devices accessible and keeping this population connected to friends and family is an important mission.