

Smartphones Letting the Visually Impaired “See” the World

Option: Smartphones with Full Accessibility to Information: Lighting Up the Cyberspace for the Blind

A massager at a blind massage parlor in Shenzhen City is using a newly bought smartphone. He has just called his parents in his hometown through the Talkback app. He can also listen to music, read books and chat on a BBS using this smartphone, which has opened up the door to the new world of Internet for him.

This man is using a Huawei smartphone. Just more than a year ago, however, human-machine interaction was something impossible for most of the visually impaired. With the growing penetration of smartphones, these consumers’ needs for Internet access receive increasing attention. In 2016, about 1,000 visually impaired people jointly posted a message on club.huawei.com/forumall-1.html, calling on Huawei to emphasize and improve experiences in terms of full accessibility to information: “I’m visually impaired and I hope that Huawei could emphasize full accessibility to information so that all the Chinese people like me also can use your smartphones.”

This message has since drawn attention from Huawei’s smartphone planning department. Today, the idea that “Full accessibility is supposed to be a default option of Internet products” is being generally accepted in the industry. Instead of a special charitable program, full accessibility should be a standard feature just like the blind’s path on the sidewalk. This department has found out through sample data and a lot of market research that there are about 70 million people in China with difficulties in reading and writing and that 92% of them are using Android-powered smartphones. Local smartphone makers have offered this feature but none of them has provided any deeply customized feature for visually impaired users. Huawei therefore has become aware that this would be a very valuable platform feature if it could attract this group of users to its smartphone line-up.

To satisfy the primary needs of visually impaired users, Huawei rapidly set up a project team including engineers, UX designers, test representatives and feature managers specializing in addressing challenges regarding smartphone operating systems with full accessibility to information. After repeated discussion, they decided to add EMUI 5.1 with full accessibility to information and defined a small objective -- lighting up the path between the visually impaired and the rest of the world through full accessibility to information.

Go Out and Listen to Critical Voices

The project team immediately started feature development, but with no idea what to begin with. Before this project kicked off, Huawei had no professional full accessibility engineers or experience in developing and test relevant features; there were even no relevant standards in China. The project team then convened its members for rounds of discussion.

Regarding system input/output, for example, a UX designer said that “I feel that message reading is troublesome. It takes much time to listen just to enter an interface. That’s far from workable, isn’t it?” A test representative then had another question: “What if something simple is not understandable?” Such discussion on relevant standards was held three or four times, although nobody was able to convince the others. It was difficult to see the real-world needs in a meeting room, where it seemed as if they had been walking in the heavy fog.

How is it possible for users to gain full accessibility to information via the project team’s design? At last, the team members decided to go out and find experts in this field or talk with end users. It turned out that they found the Information Accessibility Research Association (IARA), China’s only private organization consisting of information accessibility experts. After talks by phone, Huawei engineers decided to meet their IARA counterparts face to face.

The four representatives of Huawei project team were stunned once they arrived at IARA. In the office area with a network of paths for the blind, those who were sitting in front of computers, wearing earphones and writing codes surprisingly fast and accurately were all blind people who used computers by voice input and their own reaction. An IARA director invited the visiting Huawei engineers to have an operating experience with their eyes covered. They found themselves to suddenly become unable to handle the coming massive information, as if it had been collapsing in their minds. From that moment on, these engineers have become even more determined to offer the visually impaired a workable feature.

Create Industry Standards If They Do Not Exist

At IARA, the information accessibility engineers presented their Huawei counterparts products which they had developed with Baidu, Alibaba or Tencent, and explained the reason for every design element. The Huawei project team then instantly decided that basic accessibility experiences are common regardless of products or platforms. As in the case of sign language, it is possible to create a set of broadcast standards for information accessibility, including R&D, design and test specifications.

With that said, implementation came with problems. The engineers had questions such as “Since a lot of information needs to be transferred every moment, is voice broadcast too slow?” and “It takes much time to listen just for a simple operation. Will this adversely affect their paces of life and moods?”

The project team once again visited IARA with these questions. “It’s not that difficult. Shall we have a try?” said a smiling information accessibility engineer sitting at his desk. They then simulated online shopping on taobao.com. With voice broadcast, this engineer finished shopping easily at a normal rate.

It was then that the Huawei engineers realized that the visually impaired are able to respond to speeches at an extremely fast rate and that accurate, rich text broadcast is what they need. And what Huawei must do was to continuously adjust the speed and complexity of text broadcast and to know what is necessary for the visually impaired and what kind of speech sequence is better able to help them understand. On this basis could the project team improve relevant features in terms of richness and accuracy.

With these questions deeply considered and studied, the project team developed Huawei’s first ever broadcast standard for information accessibility, laying a solid basis for subsequent development.

Identify Points of Improvement by Entering the Blind’s Work and Life

On the basis of the information accessibility standard, the project team then needed to improve the whole system and apps. On the one hand, they conducted joint tests with IARA, whose information accessibility engineers with years of experience helped them repeatedly score every iteration in terms of accessibility experiences. On the other hand, the project team invited over twenty visually impaired users to participate in testing the beta version for such users, allowing them to listen directly to users’ voice.

Besides, Cui Qingyu, an engineer of the project team, and the feature manager often visited blind massage parlors during the above-mentioned period of time. This allowed them to talk with visually impaired users about their requirements on the use of Android-powered smartphones in order to understand potential user experiences. “What’s the primary feature that you want our smartphones to offer?” the feature manager asked a massager at a blind massage parlor.

“Input accuracy, of course. It is very difficult for us to control it. We can’t tell ‘he’, ‘she’ and ‘it’ (note: They sound the same in Chinese) apart from one another, for example,” answered this young man. Cui Qingyu still remembers the anxious expression on his face when he said this. On returning from the massage parlor, the feature manager refined voice broadcast down to the level of recognizing “he”, “she” and “it”. Every talk with the blind would bring new inspiration to the project team, and feature optimization became more specific after rounds of exploration.

The Proudest Thing: Light Up the Life of the Visually Impaired

The Information Accessibility project finally came to a successful end after 3,600 hours of

development, 7,000 joint tests and 200 adjustments! These numbers look simple, but the whole process was exhilarating. On that day, the team office was full of applause and cheers. About 25 years of age on an average, the team members jumped with joy like three-year-old children, not just for project success but more importantly for the fact that they had lit up the life of the visually impaired!

At the P10 launch in 2017, Talkback with full accessibility to information as the selling point of EMUI 5.1 was unveiled and appreciated by the attending journalists. What made the team members most relieved was a sentence said by a familiar blind massager: "It's so great! I know you can make it!" Acknowledgement by users is the greatest reward for the project team after hard work night and day.