

Research on Accessibility on Different Platforms

Zihan Shang – zhshang@bu.edu

Abstract

Approximately one in seven people worldwide have a disability or impairment that affects the way they interact with the world and their devices in multiple ways. People from any age, for any duration, and at varying levels of severity may have impairments. So it is really of great importance to improve the accessibility of everything in our daily life.

To accomplish this there are multiple ways we could work on to improve: vision, hearing, physical and motor, literacy and learning... There are lots of good platforms and apps nowadays that improve the accessibility to users, like VoiceOver from Apple, WCAG for Web developer to improve their web pages, docomo phone for disabled people...

Design for Mobile App

The most commonly used ways of accessing apps on your mobile phone are by touching, hearing and watching. For those people who have barriers in these areas, how to improve the accessibility becomes a problem.

Apple has a pretty helpful way of solving this. For watching, they develop the VoiceOver that will read out the content for each part of the screen and read out your choice before the system execute the function. In this way, visually impaired users can smoothly read the content on the screen and perform desired operations. For hearing, Apple provides alternatives to aural interaction with features such as closed captioning, visual and haptic

notifications, and Type to Siri mode. So users with hearing impairment can interact with mobile phones easily by typing. Apple also add linear motors on their devices to have tactile feedback in multiple ways. To make users easier to change between different devices they developed Handoff which makes different devices connect between each other and you can move your work from phone to laptop directly without and copy and paste.

Move to Android platform, they aim to make the UI clear, robust and specific. First they developed screen readers which is pretty much similar to VoiceOver on IOS, it is explored by touch and has a linear navigation system according to landmark. Also they use directional controllers. Hierarchy is also used, which is to make the most important information on the top of the screen and separate different kinds of data into different part of the screen according to their hierarchy system. Input focus that follows the order of the visual layout usually flows from the top to the bottom of the screen. It can traverse from the most important to the least important item. Android also increase the accessibility through color and contrast which can be used to help users see and interpret your app's content, interact with the right elements, and understand actions. Touch target spacing is also restricted to 48 x 48 dp to make touching more accessible. The system itself has enough kinds of ways to use different kinds of assistive equipment for the disabled.

Design for Web

There are four ways of improving the accessibility of web pages, perceivable, operable, understandable and robust. We will talk about it through WCAG, which is Web Content Accessibility Guidelines.

For perceivable, we have to provide text alternatives for non-text content, captions and other alternatives for multimedia, content that can be presented in different ways including assistive technologies without losing meaning, and make it easier for use to hear and see content. For operable, we have to make all functionality available from a keyboard, give users enough time to read and use content, don't use content that causes seizures or physical reactions, help users navigate and find content, make it easier to use inputs other than keyboard. For understandable, the aims are to make text readable and understandable, content appear and operate in predictable ways and then help users avoid and correct mistakes. The robust is to maximize compatibility with current and future user tools.

Findings for Apple

After studying some details about how Apple improve the accessibility for their devices, and combined with years of experiences using Apple devices, here are some findings.

First, there are many kinds of disabled people who need different kinds of assist when they use devices. The system has to be multifunction to improve their accessibility. There are lots of details we need to improve like size of the button, touch space, vibration feedback...

For VoiceOver, this is a function that Apple spends years to develop. The aim at the

beginning is to make devices that has no screens easier to use like music player. It will read out names of each song and let you choose the one you want. This is pretty much similar to the situation for blind people. So the system will turn the content on the screen into voices to let user know what function they are at. Looks like this is easy to accomplish but the control logic for this function has to be as efficient as possible incase user choose the function they didn't want to use.

Apple also use linear motor years before, which is used to simulate some physical sense in the real world. One good example is force touch with taptic-engine. When you press the screen, the motor will vibrate in a specific frequency which make the user feels like they are pressing a real button. This is pretty helpful for user who has visual defects, then can communicate better with the device through sense.

Also one-hand mode is very useful to all users. The reason is that in some situations we can't use both hands, at this time some part of the screen may be hard to get. Apple set a one-hand mode by double touch the home-button then the content on the top will move to the bottom side of the screen. Also keyboards will be separated into two parts for large size touch screen devices like iPad. These all improve the experience and convenience of using devices in our daily life.

Reference

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