

Nokia Accessibility Backgrounder

Making mobile devices more accessible for all

The desire to communicate in a mobile world does not discriminate. There are an estimated 600 million people worldwide who have a recognized disability, in addition to others with needs for improved accessibility, whether in regards to vision, hearing, speech, mobility, cognition or age.

Nokia has a long history of transforming the freedom of wireless communications, and we are working to bring this wireless world to everyone. For the people of Nokia, it all comes back to our mission of 'connecting people.'



Accessibility in action

Nokia's Senior Manager for Global Accessibility David Dzumba often gets asked the same question: "Why doesn't Nokia make special handsets for people with accessibility issues, such as a phone for the blind?" His answer is simple: "Because nobody would buy it!"

What sounds like a quip is actually based on more than a decade of research. "We talked to consumers about making a phone specifically for people who are blind, and the feedback was clear," says Dzumba. "They don't want a 'blind phone', they want the same choice of devices everyone else has. I'm older but I don't want an 'old phone'."

Nokia's inclusive approach to this issue means making the company's wide range of mobile devices accessible to the broadest possible range of consumers. "There are no old people, there are no blind people, there are no deaf people," says Dzumba. "There are people who can't hear who need visual cues, people who can't see who need audio cues." By dismantling barriers to usability, and recognizing that there is no one-size-fits-all solution, Dzumba's team is bringing real choice to people with accessibility issues.

Over the past 10 years, the team has helped make accessibility a part of mainstream product design at Nokia. Many innovations – such as voice dialing and text-to-speech software – often go unrecognized by the average user, who simply sees them as cool new features. Voice dialing and the Nokia Message Reader software are a boon for people who are blind, but are also perfect for sighted people, for example, when they are driving.

Software is becoming key to more accessible mobiles

As phones become more powerful, they are becoming more like mini computers than traditional mobiles. This has opened the door to new software applications that are improving accessibility. Personalization options allow users to make basic changes, such as adjusting color and contrast to make the display easier to read, or select more advanced options, such as having a caller's name read out.

Many of these options are standard on devices that run Nokia's S60 operating system, a platform that has been opened to third-party software developers, thousands of which are creating applications to enhance accessibility.

While much of this software inevitably debuts on high-end hardware, Nokia is adding speaking clocks, voice dialing and audio messaging into lower-cost S40 phones, and installing the S60 operating system onto mid-range handsets, enabling an ever wider audience to take advantage of the latest software and accessibility features.



Words and pictures

Mobiles are also changing the way people who are deaf communicate. Today, communicating using mobile devices is as much about text messaging, email and rich formats like video as it is about voice.

Larger screens and improved video performance on handsets are also making it possible to use sign language on mobile phones. As well, most Nokia phones are compatible with textphones (also known as TTYs and TDDs). Some models have a universal headset jack that allows you to connect them directly to a textphone. For others you'll need either the Nokia HDA-9, HDA-10 or HDA-11 adapter.

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Buzz off, **interference**

For those hard of hearing, hearing aids help to amplify sound and make speech more intelligible, but many result in a digital “buzz” of interference when mobile phones are used.

Nokia engineer Mikko Haho has been hard of hearing since birth. As digital wireless phones became the norm in the mid-1990s, Mikko began to experience interference with his hearing aids, so he built a device that would interface with them magnetically, in order to better carry out his day-to-day work.

His invention became the Nokia Inductive Loopset, which went on sale in 1998. Now in its fifth generation, the award-winning device has helped 300,000 T-coil-equipped hearing aid users in some 33 countries worldwide.

The new Nokia Wireless Loopset helps T-coil equipped hearing aid users enjoy premium audio quality and handsfree operation of their mobile phones and other compatible audio devices.

Key features of the Nokia Wireless Loopset include a vibrating alert, user adjustable sidetone level for enhanced clarity and control of own voice, and optimized volume range and frequency response.

Making **yourself heard**

People with speech-related accessibility needs can benefit from many of the text-based features that people who are deaf or hard of hearing use. But while SMS, email and instant messaging are all useful tools for communicating non-verbally on a mobile device, text-based communication does have its drawbacks.

Even instant messaging falls short of offering a true real-time conversation. The gaps between sending and receiving a message can stretch from seconds into minutes, leaving no room for interjections or the spontaneity of a spoken conversation.

Nokia is working on a solution called Total Conversation. Harnessing the increased speed of 3G networks, this downloadable application will allow users to see the other person typing in real time, so they can respond immediately – and even butt in if they wish. Real-time text could also potentially assist people who have difficulty speaking in an emergency situation.



Beyond **the screen**

More powerful mobiles are improving accessibility for people who are blind or have low vision.

It's hard for many people to imagine a mobile phone without a screen. While the traditional telephone managed without a display for over 100 years, mobiles have used them from inception, first displaying numbers, then text messages, icon-based menus, and now photos, websites and video clips.

But the advances that have made handsets more complex are also making them more accessible, through features like screen magnifiers, voice dialing and screen readers. Some less obvious accessibility features are common across the Nokia range.

Folding and sliding handset designs make it easier to answer and hang up calls or lock the keypad, for example. Meanwhile, speed dialing offers a quick and easy access to frequently called contacts, while high resolution color screens offer better contrast and the ability to personalize the color settings to suit one's level of vision. Many devices also have audible battery and signal strength alerts.

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Vocal support

Nokia Message Reader uses text-to-speech software to read out SMS messages and emails. It comes pre-installed on a number of S60 handsets or can be downloaded for free from the Nokia website.

Many S60 devices also have a Talking Ringing Tone, which announces the name of the caller. For privacy, it's best used in conjunction with a handsfree headset so people nearby can't hear who is calling.

Voice Aid, Nokia's latest software advance, groups commonly used menu items and reads out the options in similar fashion to screen readers. It comes pre-loaded on the Nokia E60, E61i, E65 and E90 Communicator, and Nokia hopes to make it available on a wider range of S60 devices in time.



Snap and read

The first reading machine for the blind – a forerunner of the modern-day scanner – was the size of a washing machine. Now its inventor, Raymond Kurzweil, has shrunk the technology so it fits into a Nokia N82.

The knfbREADER Mobile software runs on the S60 operating system and uses the Nokia N82's camera and text-to-speech software to turn the phone into the world's smallest reading machine. Users can snap almost any piece of text, from books to packaging to bank notes, and have the words read aloud.

Voice guidance helps with framing each photo, which can be

stored on the phone, uploaded to a PC, or exported to a Braille notetaker. The software can also assist people with low vision, dyslexia and learning disabilities, enlarging text and highlighting each word as it is read out on the Nokia N82's display.

Get the download

There's a wealth of software available for S60 devices that help make accessibility a reality. People who are blind or have very low vision require software that is seldom available out of the box. Fortunately a number of applications for S60 devices are available that offer assistance and even entertainment. Here are three of the most useful:

MOBILE SPEAK

This screen reader software speaks aloud everything shown on the display, allowing people who are blind or have low vision to operate every aspect of a S60-based mobile device. The software uses text-to-speech technology or can output the information to a refreshable Braille display. www.codefactory.es

ZOOMS

An application for S60 that allows people with low vision to dramatically magnify the graphics on screen, enlarging it up to 300 percent. This allows for easier reading of text messages, battery meters, signal strength and more. Also available is Talks&Zooms, which includes a full screen reader. www.nuance.com

AUDIOBOOKS

Still in development, people can try out a beta version and turn their phone into an audiobook reader. Compatible with S60 devices, this software includes the ability to skip through chapters, add virtual bookmarks and comes with a PC application to convert any existing audiobooks to the mobile format. www.nokia.com/betalabs

Check www.softwaremarket.nokia.com and www.nokia.com for more applications.



Helping handsets

By removing barriers, Nokia hopes to create devices everyone will find easier to use. The goal is simplicity in design, but not the creation of a simple phone. Simplicity as a design principle can be applied equally to both entry level and advanced handsets.

The world of mobile communications is limited only by one's imagination, not sensory, physical or cognitive abilities. And Nokia mobile phones hold plenty of promise for everyone.

More information about Nokia Accessibility can be found at www.nokiaaccessibility.com.

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