



Project Description

A “RAY of Light” on Independence for Blind and Visually Impaired People

Project RAY demonstrates the power of advanced wireless smartphone technology with the creation of the RAY device, an always-on, easy-to-use, multi-function, mobile phone with a user interface (UI) optimized for eye-free interaction. Poised to become the new gold standard in accessibility tools for blind and visually impaired people, the RAY solution uniquely enhances the typical Android smartphone. The device is equipped with many sensors - including an accelerometer, a camera, a compass, a touch screen, light sensors, GPS and telephony; providing an all-in-one, independent-living companion capable of eye-free input, text-to-speech, content access, navigation, label recognition, augmented reality and integration with social networks.

Qualcomm’s Wireless Reach initiative and Project RAY are collaborating with Israel’s Central Library for the Blind, Visually Impaired and Handicapped to build a system that enables people with visual impairments to use RAY devices to easily download and read audio-books, magazines, newspapers and other audio assets from the library.

Challenge

- 285 million people worldwide are visually impaired: 39 million are blind and 246 million have low vision.¹
- About 90 percent of the world’s visually impaired people live in developing countries.²
- About 65 percent of visually impaired people are aged 50 and older; an estimated 19 million children worldwide are visually impaired.³
- Today, blind and visually impaired people use a simple mobile phone for daily telephone communications. They also use an array of specialty devices, such as audio book-readers, color readers, navigation tools, raised Braille labels, special bar-code scanners and large-buttoned Braille-raised MP3 players. Each device has a unique UI, and the lack of integration makes them difficult to use. Collectively, these devices are prohibitively expensive.
- Audio-books, magazines and periodicals are an important form of entertainment for blind and visually impaired people. However, no timely, secure, affordable system exists today to provide these materials.



Partners

- Central Library for the Blind, Visually Impaired and Handicapped
- Project RAY
- Wireless Reach initiative from Qualcomm

2012 Statistics

- Life expectancy: 81.1 years
- Population: 7.6 million (est.)
- GDP per capita: US\$31,400 (2011 est.)
- Internet penetration: 70.4 percent (2011 est.)
- Mobile penetration: 137.4 percent (est.)

Sources: CIA World Factbook (<https://www.cia.gov/library/publications/the-world-factbook/>), Internet penetration data provided by www.internetworldstats.com/ and based on data published by the International Telecommunication Union; Mobile penetration data provided by World Cellular Information Service.

With always-on connectivity to libraries for the blind, I have real-time access to the periodicals and books I want and don't have to wait two or three weeks for a CD to arrive by mail anymore. With my RAY phone, I can browse the library shelves just like anyone else. This is a whole new reading experience and gives me the independence to make my own choices, whenever I like.

– Caterina Bloom, blind since birth, works as a Quality Assurance technician at a local bank.



The home screen of the RAY device.

Proposed Solution

- The Central Library for the Blind, Visually Impaired and Handicapped initially invited 100 people who subscribe to the library's collection of audio assets to join this project. After the trial period, any blind person who has a RAY device and subscribes to the library will be able to benefit from this new service.
- The RAY device integrates the advanced capabilities of an off-the-shelf Android OS smartphone enabled by Qualcomm's Snapdragon™ processor and the capabilities of multiple specialty devices into a single, cost-effective solution with always-on, mobile broadband connectivity.
- Optimized for eye-free interaction, the UI allows the user to touch any position on the display, then turns that position into the center of an activity, such as audio-book reading. Navigation is enabled via a single finger movement in any direction. This platform is enhanced by the smartphone's built-in vibration capabilities and voice prompts.
- A configuration wizard allows the UI to adapt its behavior to users' preferences and usage patterns.
- The device supports telephony, messaging, navigation, object recognition, social network services, remote assistance, panic services, and leisure and entertainment services.
- A system is being built by which visually impaired people can use the RAY device to easily access, download and read audio assets from The Central Library for the Blind, Visually Impaired and Handicapped in Israel. Subscribers can download audio-books, magazines, newspapers and other materials immediately and directly to their RAY devices rather than wait for hard copies to arrive on a CD by mail. The system incorporates digital rights management protection for copyrighted material.

Project Partners

- **Central Library for the Blind, Visually Impaired and Handicapped** is making audio assets available for download to RAY devices and helped select the users for the project trial.
- **Project RAY** developed the RAY device, including the UI that enables eye-free interaction and the online repository for books and assisted in choosing the participants for the trial.
- **Wireless Reach initiative from Qualcomm** is providing project funding, technical and project management support.

¹ "Visual impairment and blindness." World Health Organization. <http://www.who.int/mediacentre/factsheets/fs282/en/>

² Ibid.

³ Ibid.

Wireless Reach™ Initiative from Qualcomm

Qualcomm believes access to 3G and next-generation mobile technologies can improve people's lives. Qualcomm's Wireless Reach initiative is a strategic program that brings wireless technology to underserved communities globally. By working with partners, Wireless Reach invests in projects that foster entrepreneurship, aid in public safety, enhance the delivery of health care, enrich teaching and learning and improve environmental sustainability. For more information, please visit www.qualcomm.com/wirelessreach.