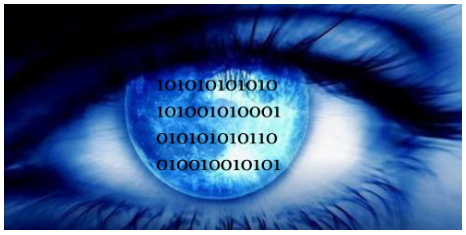
Digital



Service for Sight

By Shaina A. Lurie

AUDIENCE / DEMOGRAPHIC

Delta Gamma

In 1951, Delta Gamma became the first women's fraternity to incorporate their own philanthropy, creating *Service for Sight*. Delta Gamma's good work actually began in 1873, when the Founders adopted the motto "Do Good." In 1936, Ruth Billow, a member who was blinded in a childhood accident, made a heartfelt plea asking that Delta Gamma make a difference in the lives of those with limited or no sight. Her wish was also to help society appreciate the talents of those who are visually impaired. Delta Gamma's work for the visually impaired became unique among philanthropies as members answered the needs within their own communities as well as on an international level. (Wikipedia)

Service for Sight

Today, the Ruth Billow Memorial Fund provides financial aid to visually impaired members and educational grants to those members pursuing careers in services to the visually impaired. The Delta Gamma Foundation has given over $2.8 million in *Service for Sight* grants to organizations and schools that share their mission. In the past twenty years, 1.5 million hours have been logged for *Service for Sight*. Delta Gammas have funded genetic research, low-vision adaptive devices, tapes, Braille books and hundreds of life-enhancing programs. Members have helped men, women and children obtain independent living skills, increased communications and mobility skills. Students have been aided with free state of the art eyeglasses, specialized computer monitor technology, braille books, and unlimited access to a new children's Braille Library. (Causes)

AUDIENCE / DEMOGRAPHIC

Visually Impaired

Vision loss also known as visual impairment has varying levels of degrees in which an individual will qualify for additional support. These conditions differ based on the individuals limitations. In some cases, these circumstances could be a result of disease, trauma, or congenital or degenerative conditions. Some can be corrected by conventional means, such as refractive correction, medication, or surgery. Vision loss is defined by visual acuity of less than 20/60 or a significant central field defect. Significant peripheral field defects including homonymous or heteronymous bilateral visual, field defect or generalized contraction or constriction of field, or reduced peak contrast sensitivity with either of the above conditions. (Wikipedia)

In the United States, the terms "partially sighted", "low vision", "legally blind" and "totally blind" are used by schools, colleges, and other educational institutions to describe students with visual impairments. They are defined as follows:

1. Partially sighted indicates some type of visual problem, with a need of person to receive special education in some cases.

2. Low vision generally refers to a severe visual impairment, not necessarily limited to distance vision. Low vision applies to all individuals with sight who are unable to read the newspaper at a normal viewing distance, even with the aid of eyeglasses or contact lenses. They use a combination of vision and other senses to learn, although they may require adaptations in lighting or the size of print and sometimes Braille. (AFB)

- Myopic - unable to see distant objects clearly, commonly called near-sighted or short-sighted

- Hyperopic - unable to see close objects clearly, commonly called far-sighted or long-sighted

3. Legally blind indicates that a person has less than 20/200 vision in the better eye after best correction (contact lenses or glasses), or a field of vision of less than 20 degrees in the better eye;

4. Totally blind students learn via Braille or other non-visual media.

Visual impairment is the consequence of a functional loss of vision, rather than the eye disorder itself. Eye disorders which can lead to visual impairments can include retinal degeneration, albinism, cataracts, glaucoma, muscular problems that result in visual disturbances, corneal disorders, diabetic retinopathy, congenital disorders, and infection. Visual impairment can also be caused by brain and nerve disorders, in which case it is usually referred to as cortical visual impairment (CVI). (Wikipedia)

For this case study, the target demographic is focused on Low vision individuals. More specifically, researching and analyzing touch screen technologies for mobile devices to help Low Vision individuals learn the tools that digital natives such as myself take for granted.

TOOLS & TECHNOLOGY

Technology

Technology has revolutionized daily life for all of us, but it has had particularly dramatic benefits for people who are blind or visually impaired. Until only recently, the world of print information such as newspapers, books, signs and menus were largely closed off to people with vision loss. However, the power of innovative technology has now brought this world within reach for those who are blind or who have low vision. Some advancements have been focused on specialized hardware or software problems that simulate the human voice. Other improvements include reading the computer screen or renders hard-copy output into braille which was designed to help people with disabilities perform daily tasks. This has already changed the lives of countless individuals with visual impairments. Assistive or adaptive technology, as it is called, has exploded to education and employment for visually impaired individuals. Students with visual impairments can complete homework, do research, take tests, and read books along with their sighted classmates thanks to breakthrough technology. Adults with visual impairments can continue to work and pursue a tremendous range of careers in mainstream society because of the use of computers and other devices. Apple Inc. is one of the leading edge companies for these technologies. (eHow)

Apple

For more than 20 years, Apple has provided new and innovative solutions for people with disabilities, allowing them to access and enjoy using the Mac, iPod, iPhone, iPad, and Apple TV. For example, iPhone, iPad, iPod, and Mac OS X include screen magnification and VoiceOver, a screen-access technology, for the blind and visually impaired. Inventions such as braille mirroring, which enables deaf and blind kids to work together on the same computer at the same time; the world's first screen reader that can be controlled using gestures; and captioning of downloadable digital movies are perfect examples of Apple innovation. (Wikipedia)

TOOLS & TECHNOLOGY

Screen Readers

Screen reading software reads aloud everything on computer screens, including text, pull-down menus, icons, dialog boxes, and web pages. Screen readers run simultaneously with the computer's operating system and applications. (Disaboom)

Screen Magnification

Screen Magnification software enlarges the viewing area of a computer monitor display. Magnification levels are measured in power levels. Most screen magnification programs have the flexibility to magnify the full screen, parts of the screen, or a magnifying glass view of the area around the cursor or pointer. These programs also allow for inverted colors, enhanced pointer viewing, and tracking options. This tool helps the visually impaired to see print better range from simple hand-held magnifying glasses to lenses that fit into glass frames that the user will wear, or that fit a computer monitor. This has 2x magnification, 3x and can go up as high a level as 20x magnification. (eHow)

Speech Input

A few companies have devices that type what is dictated into them, although these items are not specifically for the vision-impaired. These devices tend to have a slow typing speed, limited computer memory and a limited ability to recognize a speaker's voice. (Gov)

Scan/ Read Systems

Scan/read systems combine software and a flatbed scanner to read aloud any printed text. Textbook pages, class handouts, and tests can be scanned in and then read aloud by a computer. (Disaboom)

Portable Notetaker

Lightweight, portable notetakers provide speech output without a visual display and can be connected to printers and computers for printing and uploading text. Braille keyboards and refreshable Braille displays are available for Braille users. A QWERTY keyboard version is available for people who prefer touch-typing. (Disaboom)

TOOLS & TECHNOLOGY

Video Magnifiers

Video magnifiers utilize closed circuit television technology to enlarge written materials and small objects for people with low vision. All printed material from textbook pages to mail can be magnified onto the CCTV for easier viewing. (eHow)

Digital Book Reader

Software playback systems are full-featured software packages designed to play RFB&D's AudioPlus CD books on a desktop or laptop computer. They are specially designed with the blind and visually impaired community in mind. (Gov)

iPad 2

Industry- leading accessibility features and FaceTime video calling. (Wikipedia)

iPod Nano

Includes VoiceOver, white-on-black video, and mono audio. (Wikipedia)

iPhone 4 & 3GS, iPad Touch

Built-in screen reader, full-screen magnification and other new accessibility features. (Wikipedia)

The basic ability of the eye is focused in the problems of creating an optimal display device. We want to make virtual objects seem real by simulating the interaction of light with their surface. Perception has helped human beings survive throughout evolution by the visual mechanics and wayfinding necessary to prosper in the hunter gatherer society. Humans can perceive light only in a range of 400 to 700 nanometers, which distinguishes our perceptions of the surfaces in our environment. "Much of human visual processing becomes more understandable if we assume that a key function of the visual system is to extract properties of surfaces" (Ware). Flow pattens help us navigate through space, avoid obstacles and generally understand the objects in our surrounding world. The perception mechanisms to understand flow patterns must be extremely sophisticated. Visual acuities are measurements of our ability to see detail that are extremely important for display technologies because they give us an idea of the limits of the information densities that we can perceive. We have light-sensing receptors in our eyes but the individual receptors tell us very little. Nerves that transmit information from the eyes to the brain transmit the amount of light falling on the retina. (Moggridge)

Neurons in early stages of the visual system do not behave like light meters; they behave like change meters. (Ware) The big problem for the visual system is to be able to extract information about the lightness, color and objects despite a great variation in illumination and viewing conditions. Therefore, technologies for the visually impaired need to have these characteristics to provide more detailed structures with the capability of the interactions of light with surfaces within their interface. (Ware)

The most important advancement since blind assistive technology began to appear in the 1970s, known as screen reading software, which simulates the human voice reading the text on computer screen or renders hard-copy output into Braille. Screen readers are designed to pick out things that will catch sited people, such as colors and blinking cursors, and can be modified to choose areas the user wants or doesn't want. The downside to screen readers is their price which can be upwards of $900. (AFB)

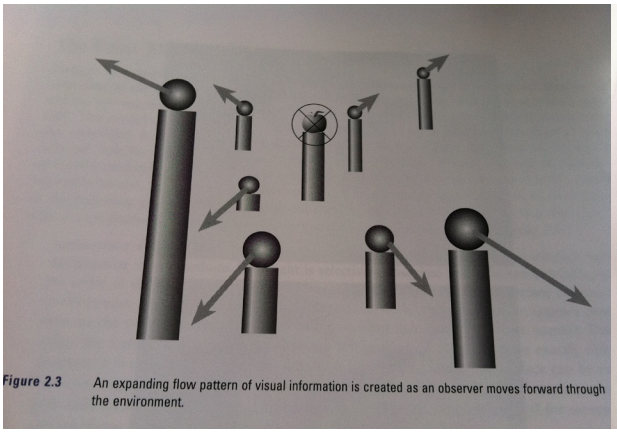


Figure 2.3 An expanding flow pattern of visual information is created as an observer moves forward through the environment.

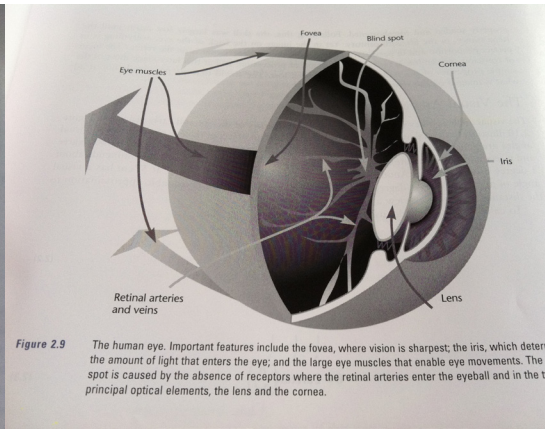


Figure 2.9 The human eye. Important features include the fovea, where vision is sharpest; the iris, which deter the amount of light that enters the eye; and the large eye muscles that enable eye movements. The spot is caused by the absence of receptors where the retinal arteries enter the eyeball and in the t principal optical elements, the lens and the cornea.

Recently, Apple began building screen reader technology, VoiceOver, into all of its computers, and a free version of a screen reader is available through Serotek. Apple also includes a screen reader in its iPhones. A screen reader is also available for Linux. The Apple VoiceOver screen reader expects the blind user to operate the phone in much the same manner as a sighted user would. All screens, all features of all screens, are made accessible to the blind user. The counter argument to this approach is that it's just not practical to expect the blind user to quickly and accurately use a touch screen, even with assistance from a screen reader, that was designed from the beginning for a sighted user. It is left up to the users to experience and try for themselves and come to their own conclusions. (Wikipedia)

An article written in 2009, *For the Blind, Technology Does What a Guide Dog Can't* in the NY Times told the story of Mr. Raman and his learnings of technology for the visually impaired. Mr. Raman, who before joining Google in 2005 worked at Adobe Systems and as a researcher at I.B.M., is intimately familiar with accessibility problems, both personally and professionally. In 2006, he developed Google's version of a search engine tailored for blind users that provides a slight preference to Web sites that work well with screen readers. The system had to test millions of Web pages. (NYtimes)

Mr. Raman, 43, is now working to modify the latest technological gadget that he says could make life easier for blind people: a touch-screen phone."What Raman does is amazing," said Paul Schroeder, vice president for programs and policy at the American Foundation for the Blind, which conducts research on technology that can help visually impaired people. "He is a leading thinker on accessibility issues, and his capacity to design and alter technology to meet his needs is unique." Instead of asking how something should work if a person cannot see, he says he prefers to ask, "How should something work when the user is not looking at the screen?" These technologies could also appeal to aging baby boomers with fading vision who want to keep using technology they've come to depend on. (NYtimes)

Touch screen cellphones are particularly challenging because they have no buttons to guide the fingers on it's glassy surface. "But Mr. Raman said that with the right tweaks, touch-screen phones — many of which already come equipped with GPS technology and a compass — could help blind people navigate the world" (NYTimes). "How much of a leap of faith does it take for you to realize that your phone could say, 'Walk straight and within 200 feet you'll get to the intersection of X and Y,' " Mr. Raman said. "This is entirely doable."The Web, while opening many opportunities for the blind is still full of obstacles that even sophisticated screen-reader software, costing more than $1,000 to maintain, are difficult to navigate on many sites. A major challenge is that technology evolves much faster than the guidelines that ensure Web sites work well with screen readers. (NYtimes)

Mr. Raman says that the features are intended to help low-vision users, but it could also prove useful to a much larger population, especially on cellphones and other devices with small screens.The screen reader is calibrated to speak at roughly triple the speed of a normal voice. To the untrained ear, the output is incomprehensible, but it allows Mr. Raman to "read" at roughly the same speed as a sighted person.Processing information quickly is a skill he has developed over the years: a video onYouTube shows him solving his Braille Rubik's Cube in 23 seconds. When he is not typing, Mr. Raman, who wears large sunglasses, is often folding and unfolding pieces of paper into tiny, origami-like geometrical shapes at prodigious speed. (NYtimes)

Mr. Chen, who is sighted, developed a free screen reader for Web pages that works with the Firefox browser. Working together much of their effort is focused on touch-screen phones."The thing I am most interested in is all of the stuff moving to the mobile world, because it is a big life-changer," Mr. Raman said. To show their progress, Mr. Raman pulled his T-Mobile G1, a touch-screen phone with Google's Android software, from a pocket of his jeans. He and Mr. Chen have already outfitted it with software that speaks much like a screen reader on a PC. Now they are working on ways to allow blind people, or anyone who is not looking at the screen, to enter text, numbers and commands. That development would complement voice-recognition systems, which are not always reliable and don't work well in noisy environments.Since he cannot precisely hit a button on a touch screen, Mr. Raman created a dialer that works based on relative positions. It interprets any place where he first touches the screen as a 5, the center of a regular telephone dial pad. To dial any other number, he simply slides his finger in its direction — up and to the left for 1, down and to the right for 9, and so on. If he makes a mistake, he can erase a digit simply by shaking the phone, which can detect motion. (NYtimes)

What may become the most life-changing mobile technology — a phone that can recognize and read signs through its camera — may still be a few years away, Mr. Raman said. Already, some devices can read text this way. But because blind users don't know where signs are, they can't point the camera at them or align it properly, Mr. Raman said. Once chips become powerful enough, they will be able to detect a sign's location and read skewed type, he said."Those things will happen," he said. When they do, sighted users will benefit, too."If you have the technology that can recognize a street sign as you drive by it, that is helpful for everyone," he said. "In a foreign country, it will translate it." (NYtimes)

Another inspirational example of touchscreen phones helping the visually impaired is from a company called Nuance Communications, Inc. Based out of Burlington, MA, Nuance TALKS is one of the leading assistive software technologies that converts display text on a handset into highly-intelligible speech for the blind or visual impaired mobile consumers. Nuance TALKS 5.0 for Series 60 5th edition touchscreen phones was annonced on March, 30th 2010. (Nuance)

Nuance Mobile builds innovative, intelligent and intuitive touch and speech interfaces to simplify and enhance the way people interact with mobile devices, applications, and services. Nuance Mobile solutions make mobile devices and in-car systems easier to use, automate customer self-service, and optimize the access and discovery of even the most advanced mobile applications and content, regardless of technical know-how, location, environment, or physical and literacy capabilities. (Nuance)

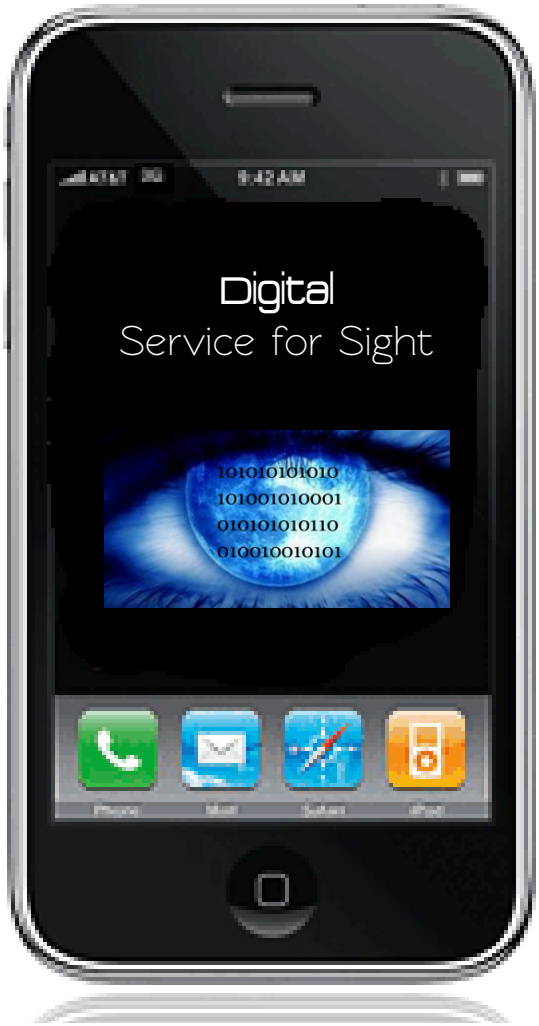
Nuance TALKS 5.0 enables both blind and visually-impaired users to take full advantage of the many features including contact directories, caller ID, text messaging, access to Web browsers, and other applications like the popular Fring messaging application – all while retaining the original user interface. Until now, it has been challenging for the visually-impaired community to use touchscreen devices given the dynamic placement of icons, letters and numbers on virtual keypads, and existing screen readers for touchscreen phones override the original user interface for low-vision and fully-sighted users. (Nuance)

Nuance TALKS 5.0 features a new exploration mode that allows users to simply slide their finger across the screen to hear menus, applications, widgets, text, and more via Nuance's robust text-to-speech capabilities. To access content, users just tap anywhere or slide their finger on the screen. The software also enables use of the virtual keypad by sliding their finger across it, and tapping once to emulate a keystroke. Additionally, Nuance TALKS 5.0 allows users to navigate all menu and application options with one hand by using the volume keys located on the side of the device, further increasing accessibility while on the go. (Nuance)

"With Nuance TALKS 5.0, we're providing blind and visually impaired consumers with access to a variety of applications and services that make today's touchscreen devices so powerful," said Michael Thompson, senior vice president and general manager, Nuance Mobile. "We're continually investing in our mobile assistive software portfolio so all consumers can stay connected with friends, family and colleagues no matter where they are – regardless of the device." This latest version also supports recent enhancements to the Series 60 calendar and email capabilities, and features enhanced audio handling and more than 20 languages worldwide. (Nuance)

IMPLEMENTATION

How can Delta Gamma's contribute to their cause Service For Sight through these new technologies? What if Delta Gamma's Philanthropy partnered with Apple Inc. and Nuance Communications Inc. to develop an App for their mobile devices? Today, Delta Gamma has over 143,400 members with 147 collegiate chapters in the United States and Canada, as well as 253 alumnae groups. If every Delta Gamma purchased this $4.99 App they would generate well over $700,000 in revenue. The App would provide the capability of using personal mobile device as a tool to help teach these skills to the visually impaired. This will help Delta Gammas around the world understand the newest technological advancements and how to utilize them. (gwDeltaGamma)



CONCLUSION

Recent technological advancements for the blind and the visually impaired are developing rapidly. Mobile devices in particular are the wave of our future. Once these technologies have become available to the masses at an affordable cost, sighted individuals should have the knowledge of the interface capablities right in their hands. Both sighted and visually impaired individuals would benefit from the experience and understanding of these tools.

A developed App that builds awareness and teaches the purpose and function of these technologies would be a huge step forward for interface and interaction design for the visually impaired. It has the potential to reach the masses and would be extremely helpful and useful especially for organizations that support causes like Service for Sight. This Digital Service for Sight App would be updateable to the most recent innovative tools. It would be a one stop shop focused resource for educating about these incredible technologies. If a user today, wanted to find out how their company could better serve the blind and visually impaired they would need to research and start from scratch. This App would be the home base, focal point and main source for learning about these innovative tools and how to help these individuals. This Digital Service for Sight App would greatly benefit Delta Gamma's outreach program and would also be valuable to other social service organizations, private and public employers, educational facilities, families and religious organizations to aid in the learning process through a centralized educational portal. This App will facilitate training, allow greater access to opportunities for employment and assist the visually impaired to become more fully integrated into our digital society.

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