

Cochlear Implants: A Hidden Technology?

By Vint Cerf

The Internet is pretty much everywhere in our country—and around the world. An estimated 84 percent of American adults use the Internet for email, to search for information, to conduct business and to plan their daily lives (source: Internet Society). This all began with the first design documents in 1973. By 1983, the Internet had been established and included international connections to Europe. Commercialization began in 1989 (in the U.S.) and the World Wide Web was introduced in 1991, growing dramatically with the arrival of the graphical MOSAIC browser in 1993 and the formation of Netscape Communications in 1994.

My own involvement with what we now know as the Internet began at UCLA in 1969 with the U.S. Defense Department's Advanced Research Projects Agency (DARPA) ARPANET project that explored packet switching technology for computer communication. In 1973, I had joined the Stanford faculty and began working with Robert Kahn, then at DARPA, on the design of what has become the Internet that pervades our culture, business, government and nearly every aspect of our lives today.

Google, the company where I currently serve as Chief Internet Evangelist, processes more than 63,000 search queries every second worldwide, which translates to more than two trillion searches per year. It is almost beyond comprehension to think of how quickly this type

of information processing has developed and the extent to which it has changed our lives in two decades.

The Internet and Cochlear Implants

Now let's compare the timeframe of the expansion of the Internet to the distribution and utilization of cochlear implants (CIs). Cochlear implants were approved by the Food and Drug Administration (FDA) for adults in 1985, a little before the commercialization of the Internet. They are currently used by only five percent of adults in the U.S. who could benefit from them (Sorkin)—or about 60,000 people. Most adults who are eligible for a CI are currently using hearing aids, with limited utility from them. The majority of people who could benefit do not seek—nor do they even know about—cochlear implants.

This is puzzling to me given what I have witnessed firsthand from my wife Sigrid's experience and the experiences of numerous friends and acquaintances. Sigrid was born with normal hearing and lost her hearing at age three from meningitis. Her parents aggressively sought to maintain the oral language she had already developed. She wore hearing aids, used an FM system and relied heavily on lipreading. Sigrid used all these tools and worked hard in the mainstreamed classrooms she was educated in. And then, 50 years later, she received the miracle of sound provided by the cochlear implant. The outcome was extraordinary, even allowing her to use a voice telephone for the first time since childhood.

The reasons for this dramatic underutilization of CIs are multi-faceted, but include a lack of awareness about the technology and ignorance about the extraordinary benefits that cochlear implants can provide to people who have the right hearing profile.

Numerous studies have documented positive quality-of-life changes and cost effectiveness of a CI intervention. People who have received them often say that their implant has improved their lives to a greater degree than other medical interventions that are more common and well-known, such as knee replacements. Unlike hearing aids, CIs are covered by nearly all insurance plans, including private or employer, Medicare, Medicaid, and government programs like Tricare. Given all of this, I believe that greater



Vint and Sigrid in the late 1960s while Vint was completing a Ph.D. in computer science at UCLA and Sigrid was a commercial interior designer



In 2013, Vint was one of five Internet and Web pioneers awarded the inaugural Queen Elizabeth Prize for Engineering.

focus and vigorous outreach is needed and justified to raise awareness about the important benefits of cochlear implants.

The American Cochlear Implant Alliance

Sigrid and I found out about the likely advantages of a CI for her over traditional amplification through an acquaintance who had one. We, in turn, have now told dozens of others about her experience. While word of mouth is a valuable and powerful communication tool, a more systematic and wide-ranging approach is needed to inform and educate others about CIs.

Sigrid and I have become aware of a new nonprofit organization that addresses this very need. In 2011, the

American Cochlear Implant (ACI) Alliance (acialliance.org) was formed to improve awareness and to take other steps to facilitate access to this life-changing technology. The Alliance has joined forces with others within and outside of the hearing loss field to harness our collective energy in a collaborative and structured way.

HAAA is an important partner with ACI Alliance in reaching people with hearing loss who could benefit from a CI as well as the audiologists and hearing aid dispensers who could also help by improving the flow of information to their patients and clients. With this kind of collaboration and with the advantages we now have for information provided via the Internet, the American Cochlear Implant Alliance can provide the rallying force needed to improve access to this extraordinary 21st century medical device. **HLM**

Vint Cerf, Ph.D., is vice president and Chief Internet Evangelist at Google. Read more about Vint below.

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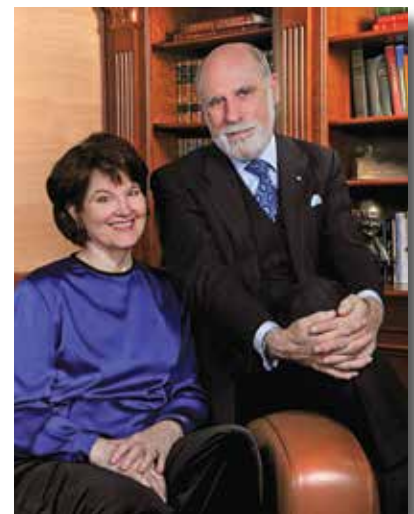
Vint Cerf: Father of the Internet

Vinton "Vint" G. Cerf is an American Internet pioneer who is often referred to as one of the "Fathers of the Internet." Along with co-inventor Robert E. Kahn, Vint developed the TCP/IP protocols and the architecture of what we now know as the Internet. Since 2005, he has served as vice president and Chief Internet Evangelist at Google. In this role, he contributes to global policy development and continued standardization and spread of the Internet.

Vint has received countless awards and commendations for his work. He was awarded the Presidential Medal of Freedom (our country's highest civilian award) from President George W. Bush, the National Medal of Technology from President Bill Clinton, the Japan Prize, and the Queen Elizabeth Prize in Engineering, among many others. In addition to his post at Google, Vint holds an appointment as distinguished visiting scientist at NASA's Jet Propulsion Laboratory where he is working on the design and implementation of an interplanetary Internet. Along with a Bachelor of Science in mathematics from Stanford University and a Master of Science and Ph.D. in computer science from UCLA, Vint holds dozens of honorary degrees.

A premature delivery caused Vint to have a sensorineural hearing loss. However, his hearing loss wasn't detected until he was about nine years old, and he has been wearing hearing aids since the age of 13. Vint's wife of more than 50 years, Sigrid, also has a hearing loss. She developed spinal meningitis when she was three years old, which left her almost completely deaf. She went to mainstream schools, but even with the help of a body hearing aid she could hear very little. Sigrid now wears bilateral cochlear implants, having received her first one in 1996 and her second 10 years later.

Vint and Sigrid have been married since 1966 and live in Virginia. They have two sons, David and Bennett. Vint enjoys fine wine, gourmet cooking and science fiction. **HLM**



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