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Gregg Vanderheiden is a Professor in the Industrial Engineering (Human Factors Program) and Biomedical Engineering Departments and Director of the Trace Research & Development Center at the University of Wisconsin-Madison. Dr. Vanderheiden is the principal investigator of the Rehabilitation Engineering Research Center on Information Technology Access, and a co-principal investigator for the RERC on Telecommunications Access funded by the National Institute on Disability and Rehabilitation Research.

Dr. Vanderheiden has been working in the area of access to technology for 40 years. He was a pioneer in the field of Augmentative Communication (a term taken from his writings in 1979). He then worked with the computer industry in getting them to build disability access features directly into their standard products. For example, access features developed by Dr. Vanderheiden and his team have been built into the Macintosh OS since 1987, OS/2 and the UNIX X Window system since 1993, and almost a dozen access features from Dr. Vanderheiden are built into Windows 95, 98, NT, 2000, Vista, Windows 7 and 8.

With the explosion in information and telecommunication technologies, and their increased importance in employment, education, and daily living, Dr. Vanderheiden and the Trace Center focused on building access into public information technologies. Recent achievements include co-authoring of the W3C's Web Content Accessibility Guidelines 2.0 and development of the EZ™ Access techniques for providing cross-disability access in electronic products of all types. His work is reflected in over 80,000 accessible ATMs, 60,000 Point of Sale terminals, and the 2,000 cross-disability accessible Automated Postal Stations of the USPS, the network of Amtrak ticket machines across the country, and kiosks in memorials, museums and airline terminals.

Most recently, Dr. Vanderheiden has led an international effort to create a Global Public Inclusive Infrastructure (GPII) that focuses on lowering the cost to develop, deploy and support access technologies and to make special access features available on demand, anywhere, any time, on any device. Of particular interest is enabling local accessibility infrastructures in developing countries.

Dr. Vanderheiden has served on numerous professional, industry and government advisory and planning committees including those for the FCC, NSF, NIH, VA, DED, GSA, NCD, Access Board and White House. Dr. Vanderheiden served on the FCC's Technological Advisory Council, was a member of the Telecommunications Access Advisory committee and the Electronic Information Technology Access Advisory Committee for the US Access Board, and served on the steering committee for the National Research Council's Planning Group on "Every Citizen Interfaces," co-authoring the National Research Council's *More Than Screen Deep* Report. He also served on the Institute of Medicine's

Committee on Disability in America, the National Task Force on Technology and Disability, and the National Academies' IOM committee on the Future of Disability in America.

He has received over 30 awards for his work on technology and disability include the ACM Social Impact Award for the Human-Computer Interaction Community, the Ron Mace Award, the Access award from AFB, the Yuri Rubinski Memorial World Wide Web Award (WWW6), and the Isabelle and Leonard H. Goldenson Award for Outstanding Research in Medicine and Technology (UCPA).

He is a past President of RESNA - Rehabilitation Engineering and Assistive Technology Society of North America, and a Founding Fellow of the American Institute of Medical and Biological Engineering (AIMBE).

Dr. Vanderheiden holds degrees in electrical engineering and biomedical engineering. He received his Ph.D. in Technology in Communication Rehabilitation and Child Development, an interdisciplinary degree between the departments of Electrical Engineering, Communicative Disorders, Rehabilitation Psychology & Special Education and Educational Psychology, at the University of Wisconsin - Madison.

TITLE OF THE PRESENTATION:

CLOUD COMPUTING AND THE PARADIGM SHIFT FOR ASSISTIVE TECHNOLOGIES

SHORT DESCRIPTION OF THE PRESENTATION:

Cloud computing is giving us important new tools and capabilities. And they are coming just in time. The field of assistive technology and accessibility in general, is reaching an inflection point. The rapid proliferation of computing platforms is making it impossible for vendors to support their products across the platforms their users are adopting. The advent of low-cost smart phones and tablets is rapidly dropping the price of AT eliminating the margins vendors depended on for R&D, outreach, and post-sale support. And the increase in built-in accessibility for some types of disability is removing some of the easy AT customers leaving vendors with only more expensive to support customers. And ICT is now moving to the cloud, SAS is replacing software products, and ICT is being designed by millions of web app developers rather than a few software companies. As a result our past approaches to AT and accessibility simply won't work as we move forward.

We need to find a way to make it possible to create solutions that can work or be translated across all of the platforms that are emerging, that can allow new techniques to be created to address the needs of unmet populations at a cost that is much lower than what AT development has cost in the past. We need to provide ways for vendors to easily market and support their products internationally. We need to make it easier for user and professionals to determine which solutions are best for each individual, and make it easier for both to keep up with the continual churn and new products being introduced. We need to establish peer support systems to help users whose needs are best met by products that do not have sufficient support systems, or products that are no longer supported. We need to create systems that will allow all countries to be able to establish and support assistive technology systems that operate at the economic scale of that country, particularly developing countries. We need more built-in accessibility and flexibility in all interfaces of mainstream products, from computers to phones to thermostats to ovens, all of which are rapidly acquiring more complex, computer like interfaces. Finally, we need a way to make creating, finding, supporting, activating and setting up AT and access features much simpler.

Efforts are now underway to create what has now been named a Global Public Inclusive Infrastructure. This infrastructure is based on three key pillars; 1) an easy way for users to discover the features or products that will make ICT possible and/or easier for them to use; 2) the infrastructure for people to be able to call up those features or AT or assistance anywhere, anytime, on any ICT or media they encounter. Essentially the ability for everything they touch to auto-personalize or change into a form that is familiar and easy for them to use; and 3) the tools, resources and infrastructure to make it much easier and less costly to create, disseminate, market, and support new solutions and products internationally in a manner that scales to the local economies of different countries. With funding from the US, Canada, and a major new grant from the European Commission (CLOUD4All) an international consortium is now in the initial stages of building such an infrastructure. The first implementations are now appearing and new participants are continually joining and contributing additional parts and refinements. The initial implementations are demonstrating not just interfaces that enlarge text or add captions, but the ability to provide completely different interfaces for people who are elderly, or for farmers in Africa who have never seen a computer and cannot write or even read text on a screen. If successful, the GPII can create a whole new ecosystem and change AT and accessibility as profoundly as the internet/web/cloud has changed ICT. The world and ICT is still just at the front edge of a profound change as a result of the internet/web/cloud. And accessibility must be able to ride this change rather than be ridden over by it. The GPII will be an important element of it – but is only an enabler for it. The rest will come from the evolution of the accessibility/AT ecosystem.