Universal Design & Assistive Technology Solutions that Benefit Everyone

Session presented by:
James Mueller | John Rempel | Carolyn Phillips
AMAC Accessibility Solutions and Research Center
College of Architecture | Georgia Institute of Technology

www.amacusg.org
AMAC Accessibility Solutions

• AMAC Accessibility is a social change organization on a mission to create affordable services for governmental, private and non-profits organization working with individuals with disabilities. Services include e-text, braille, captioning, assistive technology, office management software and consulting.
AMAC creates practical solutions that work, with a focus on utility, ease of use, and high quality.

- **Accessibility Consulting** focuses on organizational accessibility needs with evaluation, technical assistance, customer support, and website accessibility solutions.

- **Braille Services** produces customized projects from both print materials and electronic text including partial books and chapters, or graphics only, using cutting-edge technology.

- **Captioning Services** makes classrooms, meetings, labs, and other audio environments fully accessible for the deaf or hard-of-hearing.
AMAC creates practical solutions that work, with a focus on utility, ease of use, and high quality.

- **Audio Description Services** makes visual information present in multimedia accessible to persons who are blind or low vision.

- **Professional E-Text Producers** provide high-quality e-text in many formats such as PDF, DOC, DAISY, and HTML.

- **AMAC’s Certified Assistive Technology team** provides on-site and remote assessments, demonstrations, training, and technical assistance for education, work, and daily living environments.
AccessGA represents a joint initiative of the Georgia ADA Coordinator’s Office, AMAC, and GTA. The objective is to support Georgia’s state agencies with ICT accessibility, and promote equal and timely access for employees and customers with a wide range of disabilities.
Jim Mueller is an industrial designer who has worked in the field of design for people with disabilities since 1974 as an assistive technology provider, researcher, universal design consultant, and workplace accommodation specialist and instructor. His clients have included individuals with disabilities, national disability organizations such as Muscular Dystrophy Association and United Cerebral Palsy, businesses such as AT&T, SonyEricsson, Herman Miller, MetLife, NCR, and Steelcase, and federal agencies including Department of Agriculture, Department of Defense, Department of State, General Services Administration, and the Library of Congress.
What is universal design?
“Universal Design is the design of all products and environments to be usable by people of all ages and abilities, to the greatest extent possible, without the need for adaptation or specialized design.”

- Ronald L. Mace, 1991
Universal design is design for people of all ages and abilities.
Universal design

What took us so long?
Civil Rights Movement

Photo by U.S. National Archives and Records Administration
Accessibility

photo by Architect of the Capitol
15%
Why universal design?

- Longer lifespans
- Education mainstreaming
- Veterans with disabilities
- Workforce diversity
- Healthcare at home
Longer lifespans

photo by the International Caregiver
By the year 2050, 20% of the world population will be over 60.
Most rapid growth worldwide
Most desire to “age in place”
Most caregivers are females over 75
Rising number caring for grandchildren
People with disabilities also living longer

Photo from Stephen Hawking Facebook page
Healthcare at home

photo by HomeCare Magazine
Lower care costs
Lower risk of infection
Lower re-admission rates
Greater patient well-being
100 million children with disabilities
Returning war veterans

photo by Amtec
More than 900,000 veterans with disabilities from wars in Iraq and Afghanistan
Workforce diversity

photo by ARC of Virginia
Shrinking working-age population

Business incentives

Government benefit savings
Universal design is design for all...
But *NOT* one design for all
7. Size and Space for Approach and Use
Appropriate size is provided for approach, reach, manipulation, and use, regardless of the user’s body size, posture, or mobility.
6. Low Physical Effort

The design can be used efficiently and comfortably and with a minimum of fatigue.
5. Tolerance for Error

The design minimizes hazards and the adverse consequences of accidental or unintended actions.
4. Perceptible Information

The design communicates necessary information effectively to the user, regardless of ambient conditions or the user's sensory abilities.
3. Simple and Intuitive Use

Use of the design is easy to understand, regardless of the user's experience, knowledge, language skills, or current concentration level.
2. Flexibility in Use

The design accommodates a wide range of individual preferences and abilities.
1. Equitable Use
The design is useful and marketable to people with diverse abilities
Universal design and assistive technology
Accessible? Usable? Assistive?
TTY’s to text messagers
Desktop magnifiers to phone apps
Tablets + apps = assistive technology
Universal design is design for everyone who lives long enough
Thinking
Seeing
Hearing
Handling
Mobility
Universal design
Doesn’t it begin with U?
Any questions?
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Session Presenter: Carolyn Phillips

Carolyn P. Phillips is nationally recognized in the field of assistive technology and disabilities. Carolyn serves as Director and Principal Investigator of Tools for Life, Georgia’s Assistive Technology (AT) Act Program at Georgia Tech | AMAC.
In the Shadows - Mainstream

• Tim Cook, Apple Chief Executive
• 2013 speech at Auburn University
• ...people with disabilities are "in a struggle to have their human dignity acknowledged."
• "They're frequently left in the shadows of technological advancements that are a source of empowerment and attainment for others."
Mainstream Example: Mobile/Smart Phones

• iPhone - mobile phone in the mainstream market.
• Apple included a screen reader in the IOS for every iPhone.
• Increased Access for everyone – especially individuals with disabilities
• Decreased Cost – not as costly as it would be for a company specializing on screen readers
• Moved us Out of the Shadows, Into the Light!
iOS 8 – released in 2014

iOS 8 Preview

Our smartest keyboard ever.

iOS 8 makes typing easier by suggesting contextually appropriate words to complete your sentences. It even recognizes to whom you’re typing and whether you’re in Mail or Messages. Because your tone in an email may be different from your tone in a message.

Learn more >
Surface Pro 3

Runs Windows, Office, desktop apps, and browsers

Surface Pro 3 comes with Windows 8.1 Pro which means you can install your favorite desktop software, including the full Microsoft Office Suite and thousands of other essential programs for business and creativity.

Buy now
Emili, Pier Luigi; Technology and Disability, Vol. 18, No. 1, pp. 19-29

Publication Date: 2006

Paper focuses on how the concept of universal design can be applied not only to architectural elements, but to information technology as well.

The researchers developed a web-based information system that supported accessibility for all users.

The system included the following components:
- (2) the User Modeling Server, which maintained individual user profiles,
- (4) the Hyper-Structure Adaptor, which adapts information content according to user characteristics, preferences, and interests, and
- (5) the User Interface component, which also adapts itself to user preferences. A discussion of the system’s technological design is included.

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Association for the Advancement of Assistive Technology in Europe (AAATE)
UD and the Japan Airlines Co., Ltd. (JAL)

• "Attention to Quality“
• Adding psychological value from the perspective of the customer is also important.
• Added three more principles to the 7 Principles of Universal Design
Additional Three UD Principles of JAL

• Principle 1: High quality and beautiful
  – Have materials and functions been utilized to make it functional and beautiful?

• Principle 2: Comfortable
  – Has a pleasant environment been provided for both customers and staff?

• Principle 3: Sense of security
  – Is it assembled or is it a service that can be used securely for a long time?
ClaroSpeak speaks back text with high-quality speech and highlighting so you can follow the words as they are spoken.

Tap the screen to place the 'cursor point' in the text. Then tap the Play icon to start speaking. The text will be spoken from the start point with the highlighting and voice you have selected in Settings. To stop ClaroSpeak speaking, tap the Stop icon or tap anywhere in the ClaroSpeak title bar.

- Text-to-Speech
  - import documents and PDFs into ClaroSpeak from apps such as Mail, or import PDF, Word, Pages and other files directly from Dropbox using
- Change font and color
- Save text as an audio file
- Visual Tracking
- Send Text
TextHelp

- Text-to-Speech software
- Helps improves reading skills
- Built in text and picture dictionaries
- Study skills highlighter

- Google Chrome version
- www.texthelp.com
Speech Recognition Software

- Turn spoken words into text
- Connect with the timing of your thoughts
- Dictation speed 70 to 100 words per minute
Ginger

• Online grammar and spell checker
• Can see corrections as you type or use Ginger Proofreader to scan the entire document for mistakes
• Will read corrections out loud

• Has an mobile Android app
• Works inside Word and emails
• Text to Speech
  – Read emails and docs
  – Can choose voice and accent

• Ginger Demo
Tracking Trends

• Increase in Universal Design in Mainstream
• “Bring Your Own Technology”
• Customized reading levels
• Convergence
• The Future is Contextual
  – GPS in technology
  – Ads on Internet
  – Social Media
Exploring when UD becomes AT

• Companies that consider how people with varying abilities will use their mainstream products, websites and services are at a competitive advantage.

• Many Apple, Android and Microsoft products now have screen readers, enlarging programs and other adaptations for people with disabilities built in.
When UD becomes AT

• Products designed with Universal Design in mind (designing for the broadest range of human ability) are products that are not only more usable by people with disabilities, but more usable by everyone.

• For example: a website that has good color contrast is more usable by people with limited vision - but everyone will appreciate a site where the text is easy to read.
Designing for AT Efficiency

• Make no assumptions
• Design for inclusion
  – Who is the end-user?
  – What is their mode of access?
  – Consider:
    • How many keystrokes/clicks does it take to get from here to there?
    • Can I use my voice to enter information?
John has 17 years of experience working with people with disabilities. As a Quality Control and Training Specialist with AMAC, John assesses individuals' needs, develops training materials and web audits for its members, and provides quality control for AMAC training materials and e-text production.
Central visual acuity of 20/200 or less in the better eye with the best possible correction, and/or a visual field of 20 degrees or less.
Definition of Low Vision

Condition caused by eye disease, in which visual acuity is 20/70 or poorer in the better-seeing eye and cannot be corrected or improved with regular eyeglasses. - VisionAware

Or...

Severely reduced visual acuity or contrast sensitivity, a significantly obstructed field of vision – or all three. - Lighthouse International
Common Eye Diseases

- Macular Degeneration
- Glaucoma
- Diabetic Retinopathy
- Cataracts
Presbyopia

- Origin of Word: Greek word “presbys” meaning “old person”
- Typically take place between the ages of 40-50
- Caused by Loss of Elasticity of the Lens and Muscles Surrounding Lens
- Difficulties focusing far away and then nearby
AT Solutions for People Who are Blind

- Refreshable Braille Displays
- Text-to-Speech
- Speech-to-Text
- Optical Character Recognition
Refreshable Braille Displays

- Refreshable Braille Displays
Text-to-Speech

- JAWS
- NVDA
- Window-Eyes
- VoiceOver (Mac)
- VoiceOver (iOS)
- TalkBack for Android
Speech-to-Text

- Siri (Apple)
- Google Now (Google)
- Cortana (Microsoft)
Text-to-Speech for Portable Devices

- www.applevis.com
- www.androidaccess.net
Optical Character Recognition

- Open Book
- Kurzweil 1000
- Text Cloner Pro
AT Solutions for People with Low Vision

- Screen Magnification Programs
- Video Magnifiers
- Portable Video Magnifiers
Screen Magnification Programs

• MAGic
• ZoomText
• Windows Magnifier
• Mac Zoom
• Zoom and Magnifier (iOS & Android)
Video Magnifiers

- Increase/Decrease Size
- Varying Color Schemes
- Near/Distance Viewing
- Independent Light Source
- OCR/Text-to-Speech
Portable Video Magnifiers

- Portable
- Varying Color Schemes
- Near Viewing
- Independent Light Source
AccessGA Initiative

www.accessga.org