Universal Design & Assistive Technology Solutions that Benefit Everyone

Session presented by:
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College of Architecture | Georgia Institute of Technology

www.amacusg.org
Welcome!
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 deaf or hard-of-hearing.
- **Professional E-Text Producers** provide high-quality e-text in many formats such as PDF, DOC, DAISY, and HTML.
- **Certified Assistive Technology team** provides on-site and remote assessments, demonstrations, training and technical assistance for education, work, and daily living environments.

For more information, please visit our website at [www.amacusg.org](http://www.amacusg.org)
We’re here to help Georgians with disabilities gain access to and acquisition of assistive technology devices and assistive technology services so they can live, learn, work, and play independently in the communities of their choice.
Why Assistive Technology?

• For a person without a disability, technology makes things easier....

• For a person with a disability, technology makes things possible.

• TIP: USE AT. I have yet to meet a successful student with disabilities who doesn’t use Any AT.
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Design, Technology & Aging
From Problem to Product

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INNOVATIVE DESIGN CREATION PROCESS WORKBOOK

DESIGNING SOLUTIONS TO IMPROVE THE LIVES OF OLDER ADULTS

TOOLS FOR LIFE
Inclusive RERC
Georgia’s Assistive Technology Act Program

WIRELESS
Inclusive RERC

Georgia Tech Design and Technologies for Healthy Aging
School of Industrial Design

LeadingAge Georgia
GGS
WIRELESS Inclusive RERC
TechSAGE
Rapid-Fire (Brainstorming) Breakout Sessions

What is the goal?

- Consumers (end users)
- Practitioners
- Industry Reps
- Researchers
- Designers
Engineering Design Process

1. Identify / Define the Problem
2. Research the Problem
3. Design Requirements
4. Design a Solution / Concept
5. Prototype Solution
6. Evaluate Solution
7. Results

Rapid-fire Breakout session

Next Steps

Iterate

Needs Improvement
Universal design is design for everyone who lives long enough
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

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 >
• Emiliani, 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?
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.
• 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?
Universal design
and assistive technology
Accessible? Usable? Assistive?
TTY’s to text messagers
Desktop magnifiers to phone apps
Tablets + apps = assistive technology
Thinking
Seeing
Hearing
Handling
Mobility
Universal design

Doesn’t it begin with U?
Our Question to You: What have You Learned today?
The Tools for Life Team

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Thank You
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
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
Lower care costs
Lower risk of infection
Lower re-admission rates
Greater patient well-being
Education Mainstreaming

photo by
Thomas Armstrong
100 million children with disabilities
Returning war veterans
More than 900,000 veterans with disabilities from wars in Iraq and Afghanistan
Workforce diversity
Shrinking working-age population

Business incentives

Government benefit savings
Universal design is design for all... But *NOT* one design for all
The 7 Principles of Universal Design

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North Carolina State University
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