# Web accessibility

Jaana Holvikivi
School of Applications and Business

Helsinki Metropolia University of Applied Sciences

# Universal design

- Designing any product or environment involves the consideration of many factors, including
  - aesthetics,
  - engineering options,
  - environmental issues,
  - safety concerns,
  - industry standards, and cost.
- Often the design is created for the "average" user.
- In contrast, "universal design (UD) is the design of products and environments to be usable by all people, to the greatest extent possible, without the need for adaptation or specialized design"

- Source: The Center for Universal Design in Education, Washington

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# The Process of Universal Design

- **Identify the application.**
  Specify the product or environment to which you wish to apply universal design.
- **Define the universe.**
  Describe the overall population (e.g., users of service), and then consider their potential diverse characteristics (e.g., gender; age; ethnicity and race; native language; learning style; and ability to see, hear, manipulate objects, read, and communicate).
- **Involve consumers.**
  Consider and involve people with diverse characteristics in all phases of the development, implementation, and evaluation of the application.
- **Adopt guidelines or standards**.
- **Apply guidelines or standards.** In concert with best practices, apply universal design to the overall design of the application, its subcomponents, and all ongoing operations to maximize the benefit of the application to individuals with the wide variety of characteristics.

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# The Process of Universal Design

- **Plan for accommodations**.
  Develop processes to address accommodation requests (e.g., purchase of assistive technology, arrangement for sign language interpreters) from individuals for whom the design of the application does not automatically provide access.
- **Train and support.** Tailor and deliver ongoing training and support to stakeholders (e.g., instructors, computer support staff, procurement officers, volunteers).
- **Evaluate.** Include universal design measures in periodic evaluations of the application; evaluate the application with a diverse group of users, and make modifications based on feedback. Provide ways to collect input from users (e.g., online, in print, through communications with staff).

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# Universal Design Principles

1. *Equitable use*. The design is useful and marketable to people with diverse abilities. A website that is designed so that it is accessible to everyone, including people who are blind, employs this principle.
2. *Flexibility in use*. The design accommodates a wide range of individual preferences and abilities. A museum that allows a visitor to choose to read or listen to a description of the contents of a display case employs this principle.
3. *Simple and intuitive*. Use of the design is easy to understand, regardless of the user's experience, knowledge, language skills, or current concentration level. Science lab equipment with control buttons that are clear and intuitive employs this principle.
4. *Perceptible information*. The design communicates necessary information effectively to the user, regardless of ambient conditions or the user's sensory abilities. Video captioning employs this principle.

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# Universal Design Principles

5. *Tolerance for error*. The design minimizes hazards and the adverse consequences of accidental or unintended actions. An educational software program that provides guidance when the user makes an inappropriate selection employs this principle.
6. *Low physical effort*. The design can be used efficiently and comfortably, and with a minimum of fatigue. Doors that open automatically employ this principle.
7. *Size and space for approach and use*. The design provides appropriate size and space for approach, reach, manipulation, and use, regardless of the user's body size, posture, or mobility. A science lab with adjustable tables employs this principle.

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# Web Accessibility Initiative WAI

- http://www.w3.org/WAI/
- Web Content Accessibility Guidelines (WCAG) 2.0
- Designing for Inclusion design for all
- legislation requirements, see i.e. http://www.intermin.fi/fi/kehittamishankkeet/maahanmuutto_2020
- EU requirements: http://ec.europa.eu/ipg/standards/accessibility/eu_policy/index_en.htm

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# Web Content Accessibility Guidelines 2.0

- Avoid Flash and PDF
- Canvas might not show for screen readers
- Provide text alternatives for any non-text content
- Time-based Media: Provide alternatives for time-based media; audio and video
- Adaptable: Create content that can be presented in different ways (for example simpler layout) without losing information or structure.

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# Web Content Accessibility Guidelines

- Distinguishable: Make it easier for users to see and hear content including separating foreground from background.
- Keyboard Accessible
- Enough Time: Provide users enough time to read and use content.
- Seizures: Do not design content in a way that is known to cause seizures.
- Navigable
- Make text content **readable** and understandable.
- Make Web pages appear and operate in **predictable** ways.
- Input Assistance: Help users avoid and correct mistakes.
- Compatible: Maximize compatibility with current and future user agents, including assistive technologies

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# EU 10 golden rules

## Provide text alternatives

- Non-text content (images, audio and video…)
- Equivalent purpose
- Multiple ways of providing alternatives
- CAPTCHA needs accessible alternatives
- Decorative content
- Images of text

## Structure contents

- Headings
- Lists
- Data tables
- Markup vs. style sheets
- Resize text
- Bypass blocks

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## Avoid dependence on a single sense

- Captions and audio descriptions
- Use of colour
- Sensory characteristics
- Contrast
- Background audio

## Make all functionalities keyboard accessible

- Keyboard access
- No keyboard trap
- Focus order and visibility
- Unexpected behaviour
- Drop down menus, accordions, carousels…

## Give users enough time

- Timing adjustable
- Automatic redirections
- Long processes
- Banners

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## Avoid interferences

- Seizures and flashes
- Audio control
- Blinking, moving, auto-updating
- Opening new windows
- Unexpected behaviour

## Identify hyperlinks and contents

- Link purpose
- Page titles
- Language of page and parts
- Form labels
- Section headings
- Opening new windows

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## Make navigation interfaces consistent

- Consistent navigation
- Consistent identification
- Multiple ways
- Information architecture

## Help users avoid mistakes

- Labels and instructions
- Error identification
- Error suggestion
- Error prevention
- Good information architecture

## Ensure compatibility

- Web standards and code validation
- Accessible use of technologies
- User tests
- JavaScript, PDF and Flash
- WAI-ARIA: Accessible Rich Internet Applications

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# Research First

- Does the team truly understand who their users are? Do they know what those users will need from their design?
- Field research, analytics, and other study methods to understand
  which functions are important and which are nice-to-have.
- A set of scenarios

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