Web Accessibility

The Web

- "If anybody asks me what the Internet means to me, I will tell him without hesitation: To me (a quadriplegic) the Internet occupies the most important part in my life. It is my feet that can take me to any part of the world; it is my hands which help me to accomplish my work; it is my best friend – it gives my life meaning."
  - Dr. Zhang XuFounder and Director of Bethesda Rehabilitation Ministry of Anshan, China

Web Accessibility

- "On my desk is a copy of the World Wide Web Consortium's (WC3's) unhip-sounding document, Web Content Accessibility Guidelines 1.0, which advises information providers to design websites as simply as possible."
  - Quote from Technical Lead Engineer

Web Accessibility

- "Design focussed on principles of extending standard design to people with some type of performance limitation to maximise the number of potential customers who can readily use a product or service"
  - ISO (2000). Guide 71. Guidelines for standardisation to address the needs of older persons and people with disabilities

Web Accessibility

- We use *accessibility* to refer to the needs and abilities of disabled people relative to those without disabilities. A website is considered accessible when a person with disabilities can use its features as effectively as an able-bodied visitor.
 - Kel Smith, Interaction Designer

Audience for Accessibility

- People with Disabilities?
- Older People?
- All People

- Social Model: The environment will enable or disable, the environment must be designed for all

Disability

- 15% of the population of the world have a disability
- World population is 7 billion
- 15% * 7 billion = 1.05 billion

Convention on the Rights of Persons with Disabilities
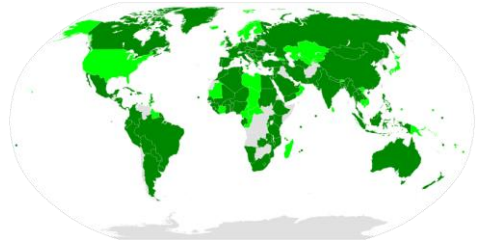
Promoting New Media and the Internet for Persons with Disabilities

« States Parties shall also take appropriate measures to…promote access for persons with disabilities to new information and communications technologies and systems, including the Internet »

Article 9 (g)

Case Study

- "[The Internet is] an essential tool. And, literally, a lifeline for many disabled people. I have Dragon Dictate. And while I was in rehab, I learned to operate it by voice. And I have enjoyed corresponding with friends and strangers with that system. Many disabled people have to spend long hours alone. Voice-activated computers are a means of communication that can prevent a sense of isolation."
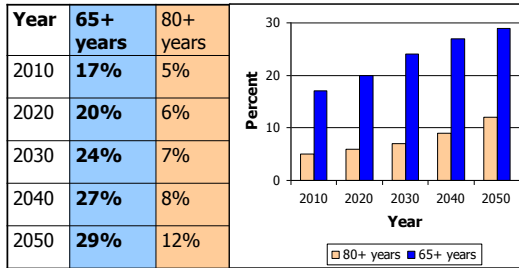 – Christopher Reeve

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Ageing

United Nations global demographic forecast

Year	65+ years	80+ years
2010	7.6%	1.5%
2020	9.3%	1.9%
2030	11.7%	2.3%
2040	14.2%	3.3%
2050	16.2%	4.3%
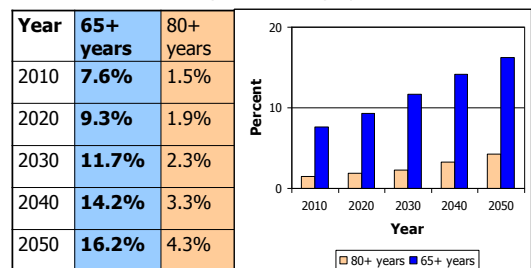
Developed with material from W3C Web Accessibility Initiative (WAI) www.w3.org/WAI/

Ageing
Demographic forecast for the EU

Year	65+ years	80+ years
2010	**17%**	5%
2020	**20%**	6%
2030	**24%**	7%
2040	**27%**	8%
2050	**29%**	12%

Ageing and hearing loss

- **Impact:**
  - Audio can be difficult to discern
  - Higher pitch sounds can be missed

- **Prevalence:**
  - 47% of people 61 to 80 years
  - 93% of people 81+ years

Ageing and vision decline

- **Impact:**
  - Decreasing ability to focus on near tasks
  - Changing color perception and sensitivity
  - Decreasing contrast sensitivity

- **Prevalence:**
  (significant vision loss)
  - 16% of people 65 - 74 years
  - 19% of people 75 – 84 years
  - 46% of people 85+ years

Ageing and physical decline

- **Impact:**
  (Motor skill decline can result from many conditions including arthritis and Parkinson's Disease)
  - Difficulty using mouse or keyboard
  - Difficult to click small areas
  - Strain from non-ergonomic tasks

- **Prevalence:**
  (Conditions most commonly reported)
  - Arthritis
    - At least 50% of people over 65 affected
  - Essential tremor
    - Affects up to 20% of people over 65
  - Parkinson's Disease
    - Approximately 4% of people over 85 affected

Ageing and cognitive decline

- **Impact:**
  Navigation, comprehension, and task completion can be affected by:
  - Short term memory problems
  - Difficulty with concentration
  - Distraction from movement or irrelevant material
  - Difficulty coping with information overload

- **Prevalence:**
  (Conditions most commonly reported)
  - Dementia:
    - 1.4% of people 65-69 yrs
    - 24% of people 85+ yrs
  - Mild cognitive impairment (MCI) is more common:
    - Around 20% of people over 70 years are estimated to experience MCI

The Internet

- 71% of UK disabled people use the internet to find information on goods and services.
- 48% of American disabled people said that going online significantly increased their quality of life.
- 54% of disabled UK citizens sampled considered Internet access essential, compared with only 6 per cent in the general population.

The Economic Model?

- An accessible website for the UK insurance company Legal & General has seen:
  - A saving of 66% in maintenance costs, amounting to UK£200,000 per annum.
  - Natural search engine traffic increased by 30%.
  - A 75% reduction in time to load a page.
  - An additional 13,000 visitors each month from improved browser compatibility alone.
  - A 95% increase in life quotes online with Life insurance sales online increasing by 90%.
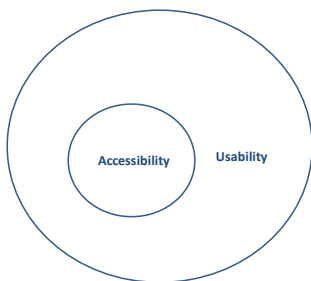
History of Web Accessibility

- Evolution of
  - Technology
  - Audience
  - Attitudes
  - Standards
- Key Questions
  - Accessibility as "Good Design" **-v-** Accessibility as "Nice to Have"
  - Accessibility **-v-** Creativity
  - Usability for Most **-v-** Accessibility for All
  - Voluntary **-v-** Enforced

Isn't Accessibility Just Usability?
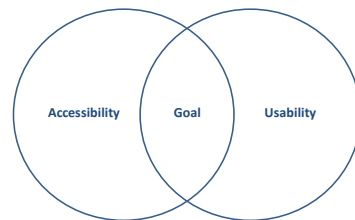
Isn't Accessibility Just Usability?

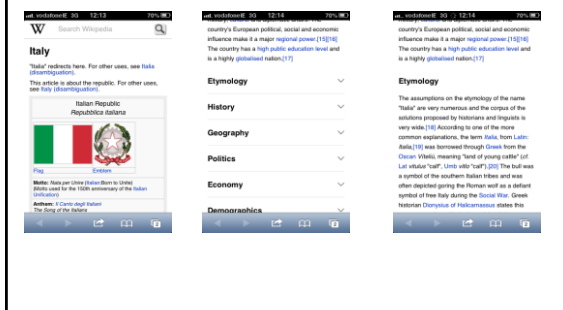## Isn't Accessibility Just Usability?

- Usability
  - Tends to focus on the *majority*, or *average user*
- Accessibility
  - Tries to focus on the margins, the users who would otherwise be excluded
  - Challenges the notion of *average user*
  - By designing for those otherwise excluded, the design is improved for all
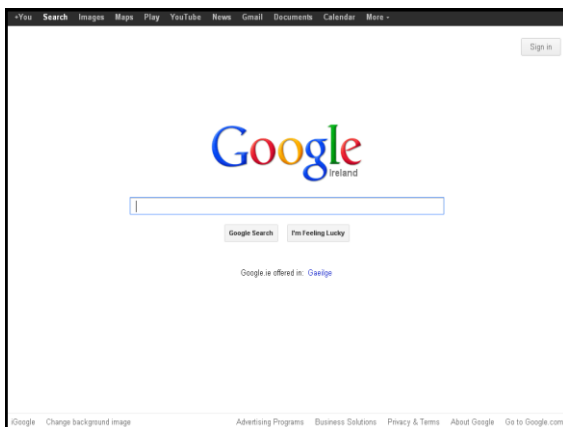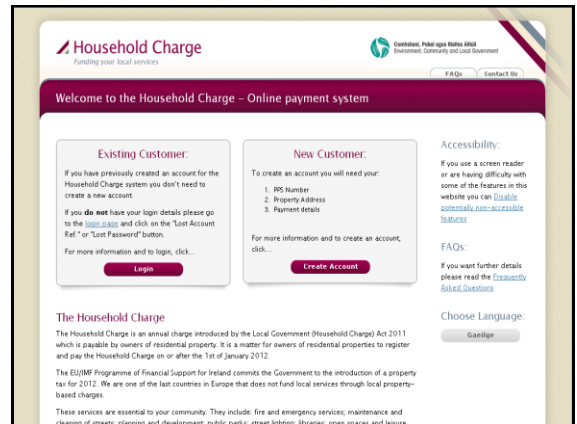
Example: Booking a Flight

Headings

What is HTML

- Hypertext Markup Language
- But, what does markup mean?
- Now, what does it **really** mean?

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HTML Elements

```
<a>          <colgroup>    <h5>         <strike>
<abbr>       <dd>          <h6>         <strong>
<acronym>    <del>         <head>       <style>
<address>    <dfn>         <hr/>        <sub>
<applet>     <dir>         <html>       <sup>
<area>       <div>         <i>          <table>
<b>          <dl>          <iframe>     <tbody>
<base>       <dt>          <img>        <td>
<basefont>   <em>          <input>      <textarea>
<big>        <fieldset>    <label>      <tfoot>
<body>       <font>        <li>         <th>
<br/>        <form>        <ol>         <thead>
<button>     <frame>       <option>     <title>
<caption>    <frameset>    <p>          <tr>
<center>     <h1>          <script>     <u>
<cite>       <h2>          <select>     <ul>
<code>       <h3>          <small>      <var>
<col>        <h4>          <span>
```
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Web Authoring

```
<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Strict//EN"
    "http://www.w3.org/TR/xhtml1/DTD/xhtml1-strict.dtd">
<html xmlns="http://www.w3.org/1999/xhtml">
    <head>
        <title>Six Nations 2013</title>
        <link href="./style.css" rel="stylesheet" type="text/css" />
    </head>
    <body lang="en">
        <h1>Six Nations 2009</h1>
        <h2>Links</h2>
        <p>This section provides links to the sections in this website</p>
        <ul>
            <li><a href="./index.html">Home</a></li>
            <li><a href="./fixtures.html">Fixtures and Results</a></li>
            <li><a href="./venues.html">Venues</a></li>
            <li><a href="./tickets.html">Tickets</a></li>
            <li><a href="./records.html">Records and History</a></li>
        </ul>
    </body>
</html>
```

Types of Element

- Aesthetic Only   • Semantic(ish)

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HTML Documents

- Documents are comprised of
  - Headings
  - Paragraphs
  - Tables
  - Images
  - Links
  - Lists
  - Forms
  - Objects

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Designing a Web Page

- Select
  - Headings
  - Paragraphs
  - Tables
  - Lists
- Create with HTML elements

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Designing a Web Page

General Website Information and Top Level Links

Universal Design Research Group
School of Computing, Dublin Institute of Technology

- Home
- People
- Projects
- Publications
- Contact Us

You are here: Homepage

This is the website of the Universal Design Research Group in the School of Computing, Dublin Institute of Technology.

Universal Design is a philosophy which guides designers to consider all users when designing any product or service, and to provide all users with identical use whenever possible, or at the very least equal use.

The philosophy is made concrete through the Seven Principles of Universal Design, compiled by researchers at North Carolina State University.

Though initially linked closely to the fields of architecture, the built environment, ergonomics and product design, the philosophy of Universal Design has now gained relevance across a much broader set of domains, in many cases implementing an already rich understanding of accessibility, user-centred design and interface design, but in other cases it has been responsible for developing de novo an interest in diversity and universality in design.

Our research group has been working in this area since 2007. Individually, our backgrounds are in the areas of software engineering, computer science and education, but collectively we are motivated by the need for good design across all domains.

Design, we consider to be a verb describing an action, and as such we are as interested in the process of design in the designed product.
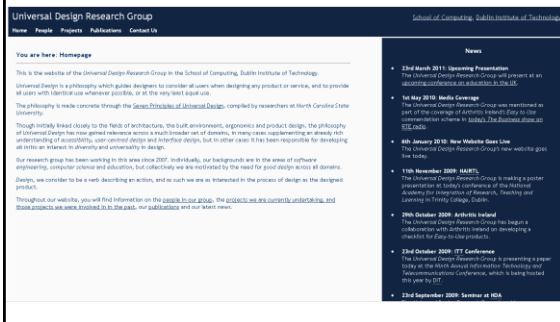
Throughout our website, you will find information on the people in our group, the projects we are currently undertaking, and those projects we were involved in in the past, our publications and our latest news.

This is the end of the content of this page. Everything that follows is news.

News

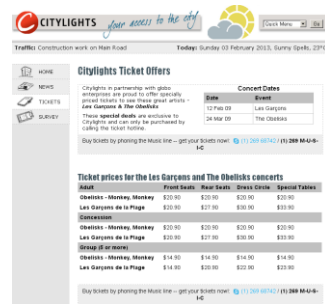- 23rd March 2013: Upcoming Presentation...

Presenting a Webpage

Separate Content and Presentation

- Check out
  http://www.w3.org/WAI/demos/bad/

Inaccessible

Accessible

How is this webpage coded?

irishtimes.com

- 47 headings
  - 1 h1 (for *Latest*)
  - 14 h2
  - 4 h3
  - 24 h4
- 280 links

alt

- Provide *meaningful* alternative text for images
- 15 years after the introduction of the `alt` attribute, only 7% of images have appropriate alternative text!
- Google webmaster guidelines
  – Use text instead of images for important content
  – Make sure `title` and `alt` values are meaningful

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Meaningful Alternative Text

- Consider the purpose of the image
- There will inevitably be some loss
- Imagine trying to describe the image to someone over the phone
- Consider the likely consumers of the image

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Alternative Text

```
<img src="church.jpg"
  title="Church Interior"
  alt="This image shows the
  inside of a church. The
  altar is visible at the back
  of the image. The front
  three pews on the left
  hand side are visible.
  There is a partial view of
  the right hand side
  pews."/>
```

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Colour

- Don't rely on colour alone, support with text
- Don't use subtle contrast in colour

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Forms

- Label Input Fields

```
<form method="POST" action="/login">

<label for="username">Username:</label>
<input type="text"
              name="username"
              id="username"
              size="10"
              maxlength="10"/>
<br/>
<label for="password">Password:</label>
<input type="text"
              name="password"
              id="password"
              size="10"
              maxlength="10"/>
<br/>

</form>
```
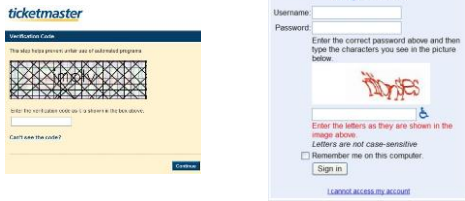
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Forms

- Validation
  – Identify required fields
    - Use the word *required*, or
    - Use an image of, say, an asterisk, with alt set to *required*
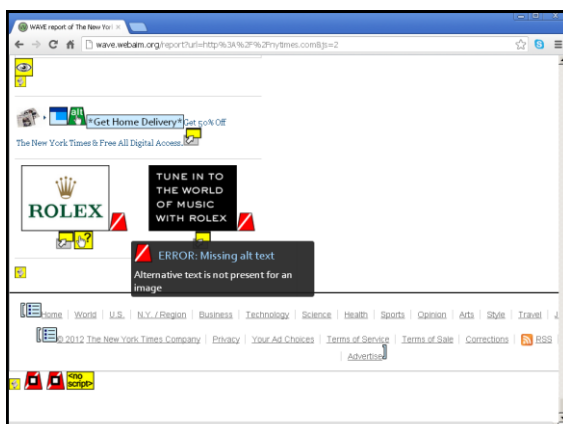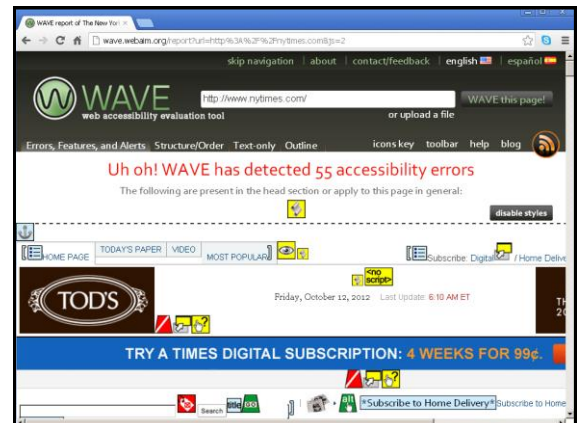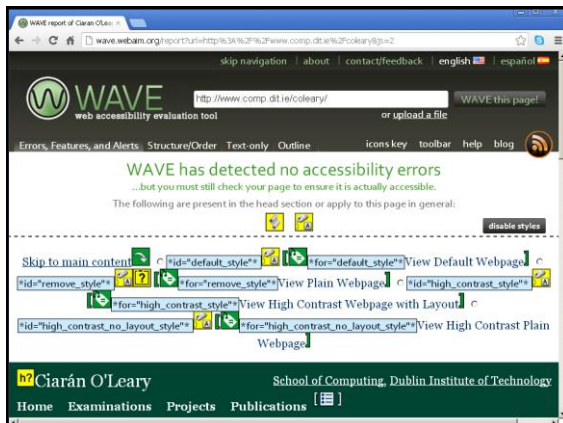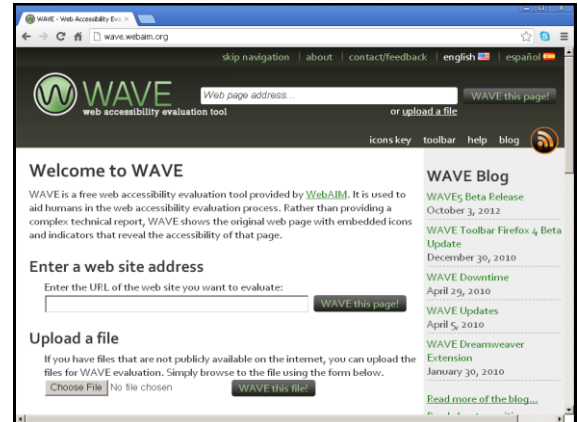 – Use only one alert box, if any, to inform of errors

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CAPTCHA

- Completely Automated Public Turing Tests to Tell Computers and Humans Apart
- Inaccessible

WAVE - Web Accessibility evaluation tool

WAVE has detected no accessibility errors

Uh oh! WAVE has detected 55 accessibility errors

ERROR: Missing alt text
Alternative text is not present for an image

Principles of Universal Design

1. Equitable Use
2. Flexibility in Use
3. Simple and Intuitive
4. Perceptible Information
5. Tolerance for Error
6. Low Physical Effort
7. Size and Space for Approach and Use

Principle 1: Equitable Use

Principle 2: Flexibility in Use

Principle 3: Simple and Intuitive Use

Principle 4: Perceptible Information

Principle 5: Tolerance for Error

Principle 6: Low Physical Effort

Exercise

- Select a website
- Use http://wave.webaim.org/ to evaluate the site
- Report back on the types of errors encountered, if any!

Summary

- Social model of disability
- Economic model of disability
- Accessibility is usability from the margins, usability for all
- Designing accessible web pages is as easy/difficult as designing inaccessible web pages