


# Web Accessibility

An abstract graphic featuring a central white sphere with four colorful, flowing ribbons (yellow, green, blue, and red) extending from it. The background is a light blue gradient with faint, semi-transparent icons representing accessibility: a person in a wheelchair, an eye, an ear, a hand, and a speaker. Binary code (0s and 1s) is also visible in the background.

**Digital Inclusion Division  
Office of the  
Government Chief Information Officer**

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**(Adapted for COMP 4021 by Dik Lee)**

# What is Web Accessibility?

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- Making website **Content** available for **ALL**
  - Including persons with disabilities (361,000 about 5.2% of total population)

## Four Major categories of disabilities

- Physical Impairment
- Hearing Impairment
- Visual Impairment
- Cognitive Impairment



# Common Pitfalls in Web Accessibility

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1. Use ALT with meaningful description for non-text content
2. OCR scanned documents so text-to-speech software works
3. You want text message to look nice, use CSS, do not use graphical images
4. Provide text resizing function
5. Maintain sufficient color contrast
6. Use simple page layout (structured by row or column)
7. Provide skip button to skip video and animation, etc.
8. Avoid background audio/music
9. Provide caption and description for video and audio

# Legislation / Guideline

Country	Legislation / Guideline
Australia	<ul style="list-style-type: none"><li>• Disability Discrimination Act (DDA) of 1992</li><li>• WWW Access: DDA Advisory Notes</li><li>• The Guide to Minimum Website Standards</li></ul>
Canada	<ul style="list-style-type: none"><li>• Canadian Human Rights Act of 1977</li><li>• The Government of Canada Internet Guide</li></ul>
China	<ul style="list-style-type: none"><li>• 國務院令第622號 - 《無障礙環境建設條例》</li></ul>
United Kingdom	<ul style="list-style-type: none"><li>• The Equality Act 2010</li><li>• Formal investigation report on Web Accessibility</li></ul>
United States	<ul style="list-style-type: none"><li>• American with Disability Act (ADA)</li><li>• Section 508 of the Rehabilitation Act</li><li>• Assistive Technology Act of 1998</li><li>• Section 255 of the Telecommunications Act of 1996</li></ul>
European Union	<ul style="list-style-type: none"><li>• Accessibility of Public Websites – Accessibility for PWDs: Council Resolutions, 2002</li></ul>



# Lawsuits and Complaints

- Complaint against Sydney Organising Committee for the Olympic Games 2000
  - No alternative text for image and contained inaccessible image map
  - Compensation sum of AU\$20K paid by respondent
- National Federation of the Blind filed a class-action suit with 50,000 names against Target.com in 2006
  - No alternative text for image and inaccessible image maps, etc
  - Target settled the class suitcase by set up a fund US\$6M for claims
- A NGO complained about inaccessible PDFs on Hong Kong Government website in June 2012



# International Standards

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- **World Wide Web Consortium (W3C)**
  - **Web Content Accessibility Guidelines (WCAG)** have been developed over the years by W3C
- Version 1.0 in 1999; version 2.0 in 2008

<http://www.w3.org/WAI/>

# Principle 1 - Perceivable

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- 1.1 **Text Alternatives:** Provide text alternatives for any non-text content so that it can be changed into other forms people need, such as large print, braille, speech, symbols or simpler language
- 1.2 **Time-based Audio and Video Media:** Provide alternatives for time-based media
- 1.3 **Adaptable:** Create content that can be presented in different ways without losing information or structure
- 1.4 **Distinguishable:** Make it easier for users to see and hear content including separating foreground from background

# Principle 2 - Operable

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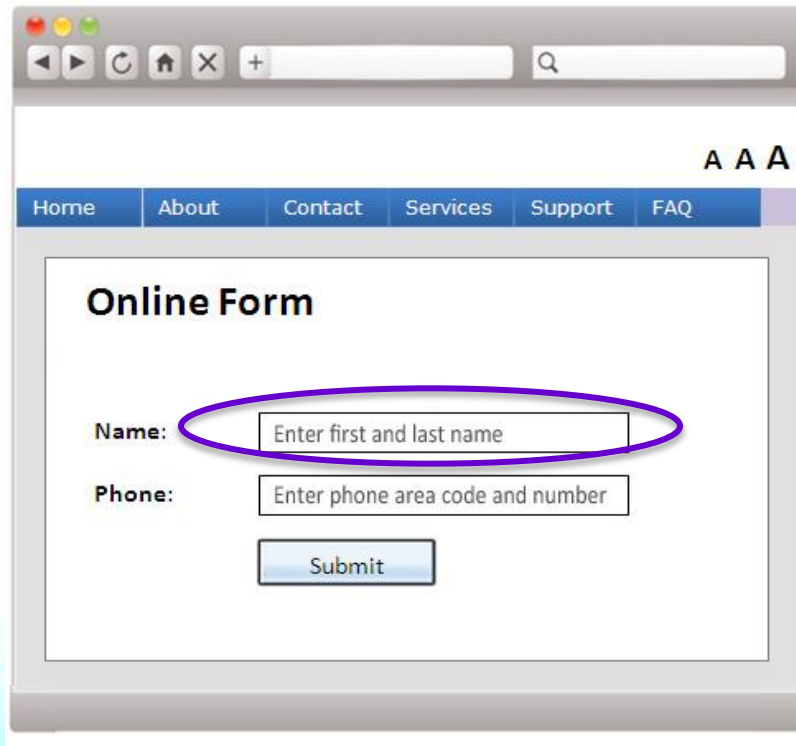
- 2.1 **Keyboard Accessible:** Make all functionality available from a keyboard
- 2.2 **Enough Time:** Provide users enough time to read and use content
- 2.3 **Seizures:** Do not design content in a way that is known to cause seizures
- 2.4 **Navigable:** Provide ways to help users navigate, find content, and determine where they are





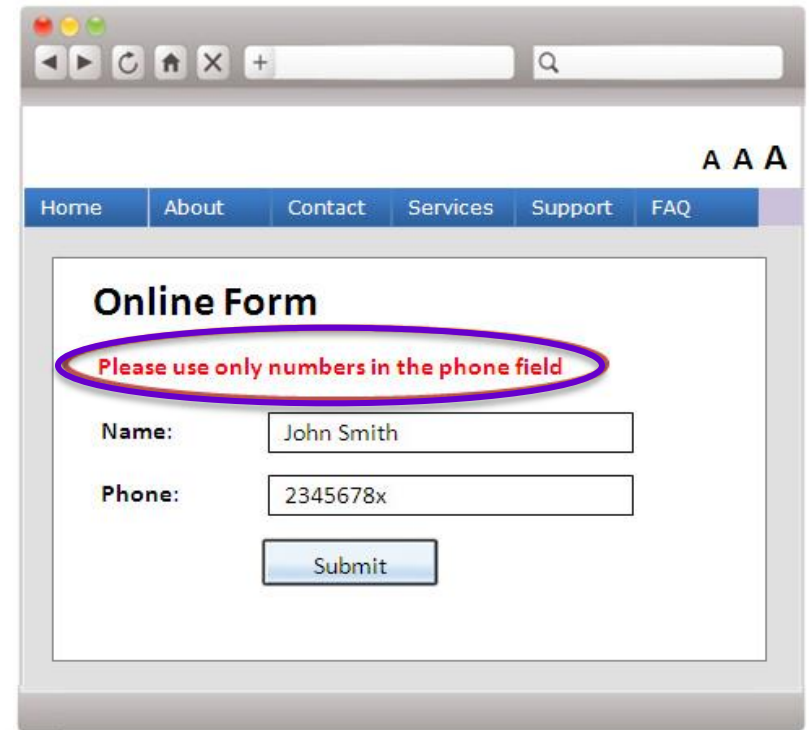
# Principle 3 – Understandable

- Example - Clear label with cue and error identification



A screenshot of a web browser displaying an "Online Form". The browser window has a standard address bar and navigation buttons. The page has a blue navigation bar with links: Home, About, Contact, Services, Support, and FAQ. The form itself is titled "Online Form" and contains two input fields. The first field is labeled "Name:" and has a placeholder text "Enter first and last name". The second field is labeled "Phone:" and has a placeholder text "Enter phone area code and number". A "Submit" button is located below the phone field. A purple oval is drawn around the "Name:" label and its corresponding input field, highlighting the input assistance.

Input assistance

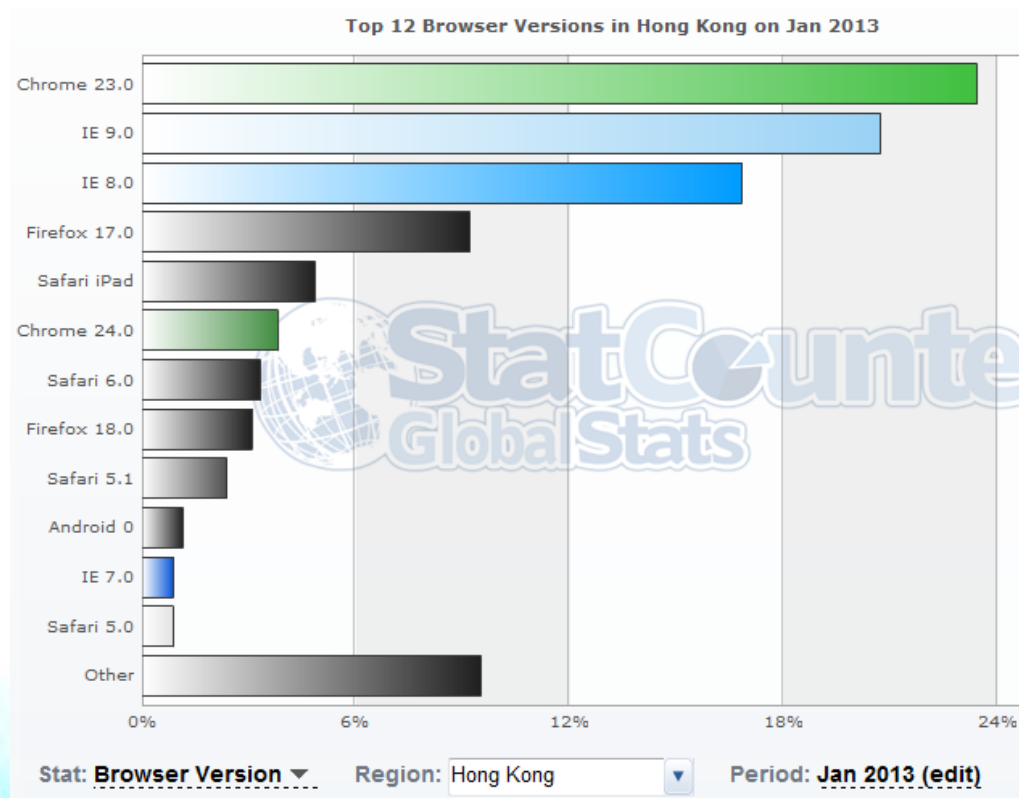


A screenshot of a web browser displaying the same "Online Form" as the previous image. The browser window and navigation bar are identical. The form is titled "Online Form" and contains two input fields. The first field is labeled "Name:" and has the text "John Smith" entered. The second field is labeled "Phone:" and has the text "2345678x" entered. A "Submit" button is located below the phone field. A red error message, "Please use only numbers in the phone field", is displayed above the phone input field and is circled with a purple oval, highlighting the error identification.

Error identification

# Principle 4 – Robust

- Compatibility with browsers



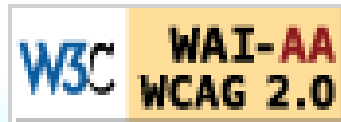
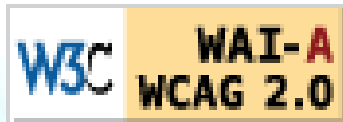
<http://gs.statcounter.com/>

# WCAG - Conformance

- Latest version of W3C WCAG 2.0 promulgated in end 2008
- There are three Levels of conformance –

Level A 25 success criteria	Level AA +13 success criteria	Level AAA +23 success criteria
Basic	Recommended	Ideal

Level AA Conformance



# Governments Websites adopting WCAG

Country	Standard	Timeline to achieve standard
New Zealand	WCAG 2.0 Level AA	June 2010
United Kingdom	WCAG 1.0 Level AA	March 2011
Hong Kong	WCAG 2.0 Level AA	January 2013
Canada	WCAG 2.0 Level AA	July 2013
Singapore	WCAG 1.0 and key aspects of WCAG 2.0	December 2013
Australia	WCAG 2.0 Level A & AA	December 2014



# Testing Techniques

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## 1. Code scanning

- Many accessibility issues can be detected automatically using specialist software and tools
- Example tools –
  - AChecker
  - WAVE
  - PDF Accessibility Checker

# Code Scanning

- <http://achecker.ca/checker/index.php>

The screenshot shows the AChecker Web Accessibility Checker interface. At the top, there are links for 'Login' and 'Register', and the 'Web Accessibility Checker' title. The main section is titled 'Check Accessibility By:' and has three tabs: 'Web Page URL', 'HTML File Upload', and 'Paste HTML Markup'. The 'Web Page URL' tab is active, showing an 'Address:' label and a text input field. Below the input field is a 'Check It' button. To the right of the input field, a yellow arrow points to it with the text 'Enter webpage address for testing'. Below the input field, there is an 'Options' section with a dropdown arrow. It contains three checkboxes: 'Enable HTML Validator', 'Enable CSS Validator', and 'Show Source'. Below these are 'Guidelines to Check Against' with three columns of radio buttons: 'BITV 1.0 (Level 2)', 'WCAG 1.0 (Level A)', 'WCAG 2.0 (Level A)', 'Section 508', 'WCAG 1.0 (Level AA)', 'WCAG 2.0 (Level AA)', 'Stanca Act', 'WCAG 1.0 (Level AAA)', and 'WCAG 2.0 (Level AAA)'. Below the guidelines is a 'Report Format' section with two radio buttons: 'View by Guideline' and 'View by Line Number'. To the right of the options section, a yellow arrow points to it with the text 'Select testing options'. At the bottom, there is a 'Welcome to AChecker' message and a copyright notice.

**Check Accessibility By:**

**Web Page URL** **HTML File Upload** **Paste HTML Markup**

Address:

**Options**

☐ Enable HTML Validator ☐ Enable CSS Validator ☐ Show Source

**Guidelines to Check Against**

☐ BITV 1.0 (Level 2) ☐ Section 508 ☐ Stanca Act

☐ WCAG 1.0 (Level A) ☐ WCAG 1.0 (Level AA) ☐ WCAG 1.0 (Level AAA)

☐ WCAG 2.0 (Level A) ☒ WCAG 2.0 (Level AA) ☐ WCAG 2.0 (Level AAA)

**Report Format**

☒ View by Guideline ☐ View by Line Number

**Welcome to AChecker.** This tool checks single HTML pages for conformance with accessibility standards to ensure the content can be accessed by everyone. See the Handbook link to the upper right for more about the Web Accessibility Checker.

Web site engine's code is copyright © 2011

# Code Scanning

- Sample report - no known problem

[Login](#) [Register](#)

**Web Accessibility Checker**

ACHECKER®

Web Accessibility Checker

Check Accessibility By:

**Web Page URL** **HTML File Upload** **Paste HTML Markup**

Address:


Options

**Accessibility Review**

Export Format:  Report to Export:

Accessibility Review (Guidelines: [WCAG 2.0 \(Level AA\)](#))

**Known Problems(0)** **Likely Problems (2)** **Potential Problems (505)** **HTML Validation** **CSS Validation**

 **Congratulations! No known problems.**

# Code Scanning

- Sample report – known web accessibility problem

## Accessibility Review

Accessibility Review (Guidelines: [WCAG 2.0 \(Level AA\)](#))

Known Problems(9)

Likely Problems (1)

Potential Problems (215)

### 1.1 Text Alternatives: Provide text alternatives for any non-text content

#### Success Criteria 1.1.1 Non-text Content (A)

Check 1: [img element missing alt attribute.](#)

**Repair:** Add an `alt` attribute to your `img` element.

### 2.4 Navigable: Provide ways to help users navigate, find content, and determine where they are.

#### Success Criteria 2.4.4 Link Purpose (In Context) (A)

Check 174: [Anchor contains no text.](#)

**Repair:** Add text to the `a` element or the `title` attribute of the `a` element or,

✖ *Line 228, Column 39:*



# Testing Techniques

## 2. Visual review: Tools include Vischeck and Colour Contrast Check

- <http://www.vischeck.com/vischeck/> shows you what things look like to someone who is colour blind



www.ogcio.gov.hk



Looks to a person with a red/green color deficit (deuteranopia)

# Colour Contrast Check

- [http://snook.ca/technical/colour\\_contrast/colour.html](http://snook.ca/technical/colour_contrast/colour.html)
- Text has a contrast ratio of at least 4.5 : 1 between the background and the foreground

Foreground Colour:	Background Colour:	Results
#007897	#F1F1F1	<p>This is example text. <b>Some of it bolded.</b> <i>Some of it italicized.</i></p>
Red: <input type="text"/>	Red: <input type="text"/>	Brightness Difference: ( $\geq 125$ ) <input type="text" value="153.34"/>
Green: <input type="text"/>	Green: <input type="text"/>	Colour Difference: ( $\geq 500$ ) <input type="text" value="452"/>
Blue: <input type="text"/>	Blue: <input type="text"/>	Are colours compliant? <input type="text" value="sort of.."/>
Hue (°) <input type="text"/>	Hue (°): <input type="text"/>	<b>Contrast Ratio <input type="text" value="4.5"/></b>
Saturation (%) <input type="text"/>	Saturation (%): <input type="text"/>	<b>WCAG 2 AA Compliant <input type="text" value="YES"/></b>
Value (%) <input type="text"/>	Value (%): <input type="text"/>	WCAG 2 AA Compliant (18pt+) <input type="text" value="YES"/>
		WCAG 2 AAA Compliant <input type="text" value="NO"/>
		WCAG 2 AAA Compliant (18pt+) <input type="text" value="YES"/>

# Testing Techniques

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## 3. Manual testing with screen readers

- Navigate website and access the content through the screen readers
- Example tools – Jaws, NVDA and VoiceOver

## 4. Manual testing with other assistive technologies

- Screen magnification tools and voice control tools
- Example tools – ZoomText and Dragon Naturally Speaking

## 5. Human testing



# Policy in Hong Kong

- Require all government websites, except archive materials, to achieve [W3C WCAG 2.0 Level AA](#) conformance by **January 2013** within practicable means
- Ask quasi-government and public service organisations to take corresponding action
- Webforall Portal: [www.webforall.gov.hk](http://www.webforall.gov.hk) and Web Accessibility Handbook
- Web Accessibility Recognition Scheme (Gold and Silver Awards)
  - HKUST: Auditory and Speech Training App" for hearing-impaired children, Gold Award in Web Accessibility Recognition Scheme 2014  
[http://www.seng.ust.hk/web/eng/news\\_detail.php?id=823](http://www.seng.ust.hk/web/eng/news_detail.php?id=823)
  - HKUST: Android mobile application for hearing impaired children, Gold Award in Web Accessibility Recognition 2015  
<https://www.cse.ust.hk/News/WARS2015/>





# How you can help?

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- Develop awareness, attitude and mindset on web accessibility in your organization
  - Observe latest guidelines and standards
  - Adopt web accessibility designs in institution
  - Help business partners or clients aware of the importance and relevant skills
  - Encourage and incorporate web accessibility elements in design stage in information and communication systems, products and services
  - Uphold the professional ethics
- “I had never thought about it ...” is not an excuse