Web Consistency Testing

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GTAC 2011

Different Levels of Automated Web Testing

Back-end

Unit testing data models
Functional testing URL endpoints
JUnit, TestNG, rspec, NUnit, etc.

Front-end

HTML & CSS validation
Unit & functional testing JavaScript
JSLint, QUnit, TestSwarm, etc.

End-to-end Integration

Browser control
Selenium
Watir

Acceptance test
Capybara
Cucumber

What about the user?

How To Break a Page

- Apathy

- Lack of skill

- Impossible design

- Unreasonable deadline

- Ambiguous Web specs

- Browser differences

- New i18n translations

- Long CMS content

- Bandwidth constraints

- Regression: Fix one page, break another

Spectrum of Render Testing Strategies

No
Testing

Manual
Testing

Almost always an afterthought, when issues are nearly the most expensive to fix.

Why Not Automate?

- If it were doable, it'd be done by now

- You can't test style

- Browser clusters are expensive

Towards Automation

- *Fighting Layout Bugs*

  - Michael Tamm - GTAC 2009

  - Automates detection of common layout bugs

  - Requires Java/JVM right now

Web Consistency Testing

* Formally:

  * Ensuring a consistent experience for all your customers

* Colloquially:

* Does the page look "right?"

A Case of Indifference

Chrome

IE 9

A Big Difference

Chrome

Want to be the first to know about the launch of our upcoming apps?   *Add your email address here...*   Submit

Firefox 6

Want to be the first to know about the launch of our upcoming apps?

Add your email address here...   Submit

f*(reference page, comparison page)*
$\Rightarrow$*{ rendering issues }*

Representing a Page

- Image

  - How a customer sees it

- DOM

  - How a browser displays it

Image Representation

* Great for pixel-perfect

* Great for single page

* Lots of image comparison algorithms

* 100% browser-independent

* Lacks semantic meaning

* Easily confused by rotating content

Image Comparison Landmine

DOM Representation

- Great for multiple pages

- Mostly dealing with rectangles in 3D space

- Simple geometric algorithms

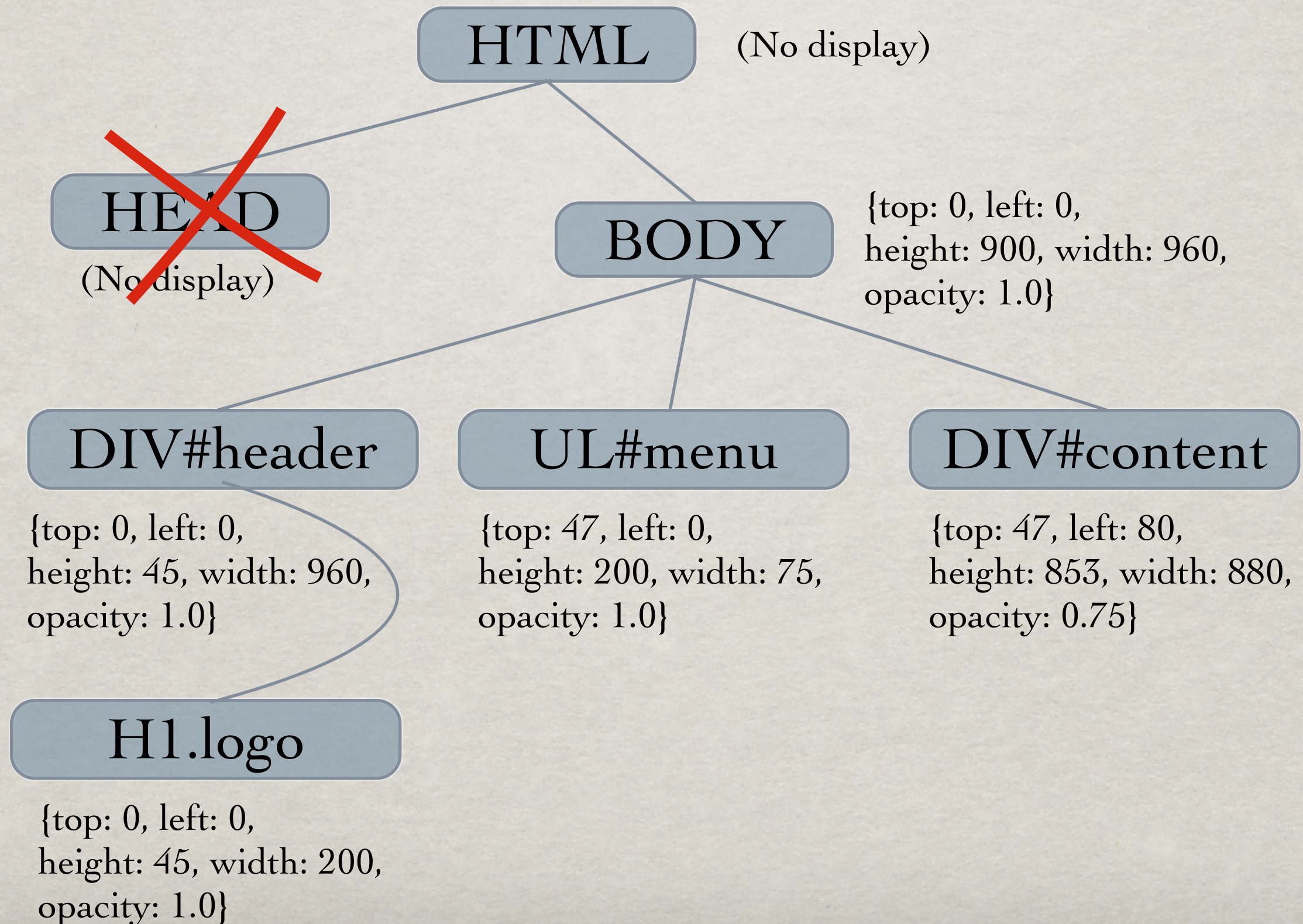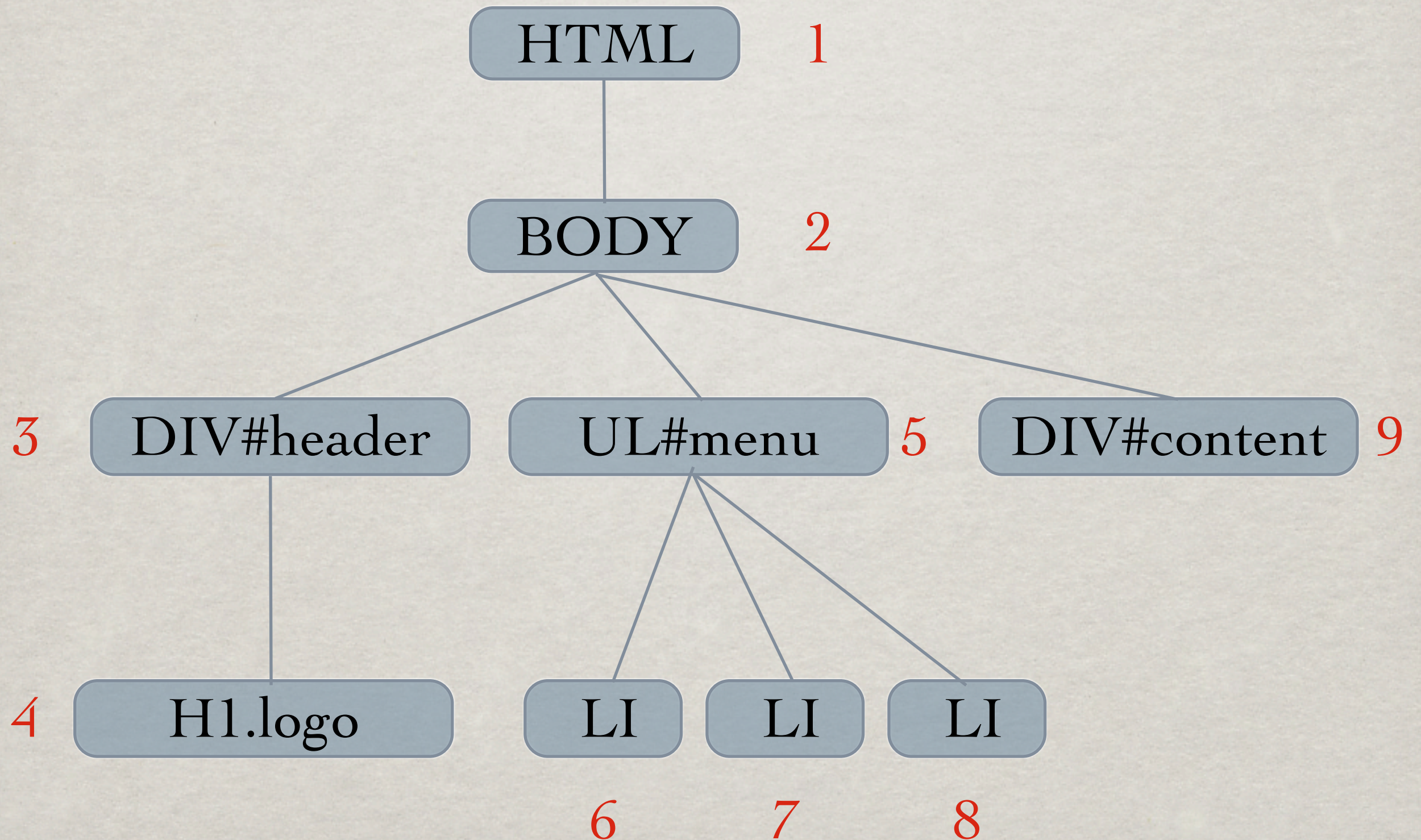- Rich semantic meaning

- Requires conditioning

DOM Structure

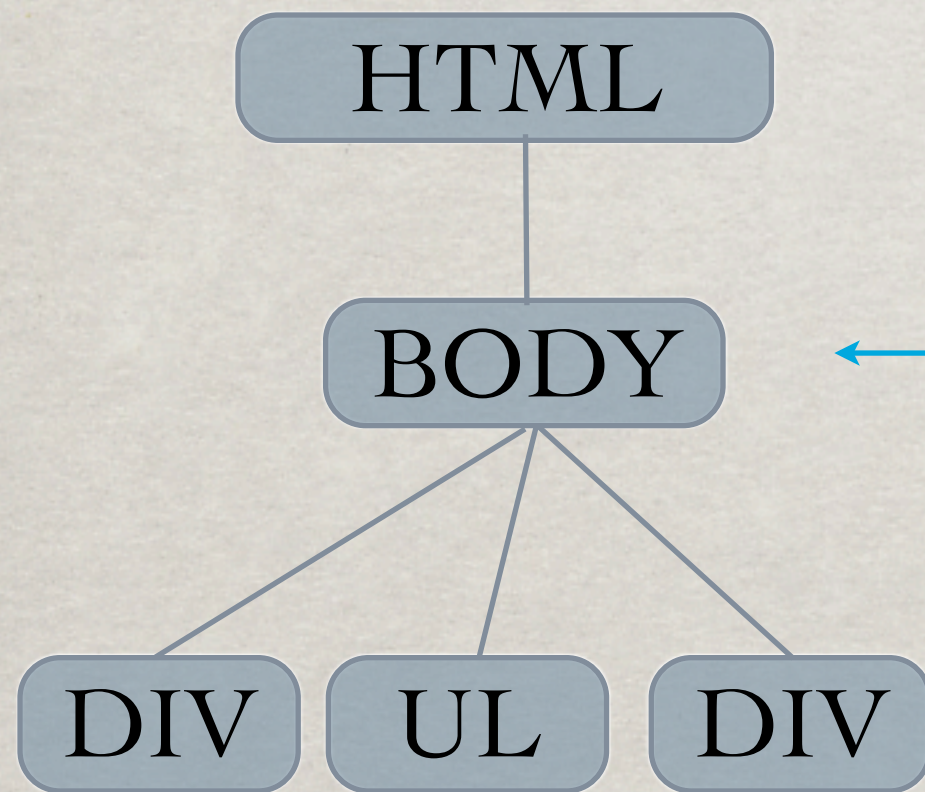HTML   (No display)

HEAD
(No display)

BODY   {top: 0, left: 0,
height: 900, width: 960,
opacity: 1.0}

DIV#header

UL#menu

DIV#content

{top: 0, left: 0,
height: 45, width: 960,
opacity: 1.0}

{top: 47, left: 0,
height: 200, width: 75,
opacity: 1.0}

{top: 47, left: 80,
height: 853, width: 880,
opacity: 0.75}

H1.logo

{top: 0, left: 0,
height: 45, width: 200,
opacity: 1.0}

DFS

HTML   1

BODY   2

3   DIV#header   UL#menu   5   DIV#content   9
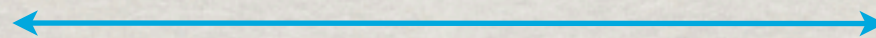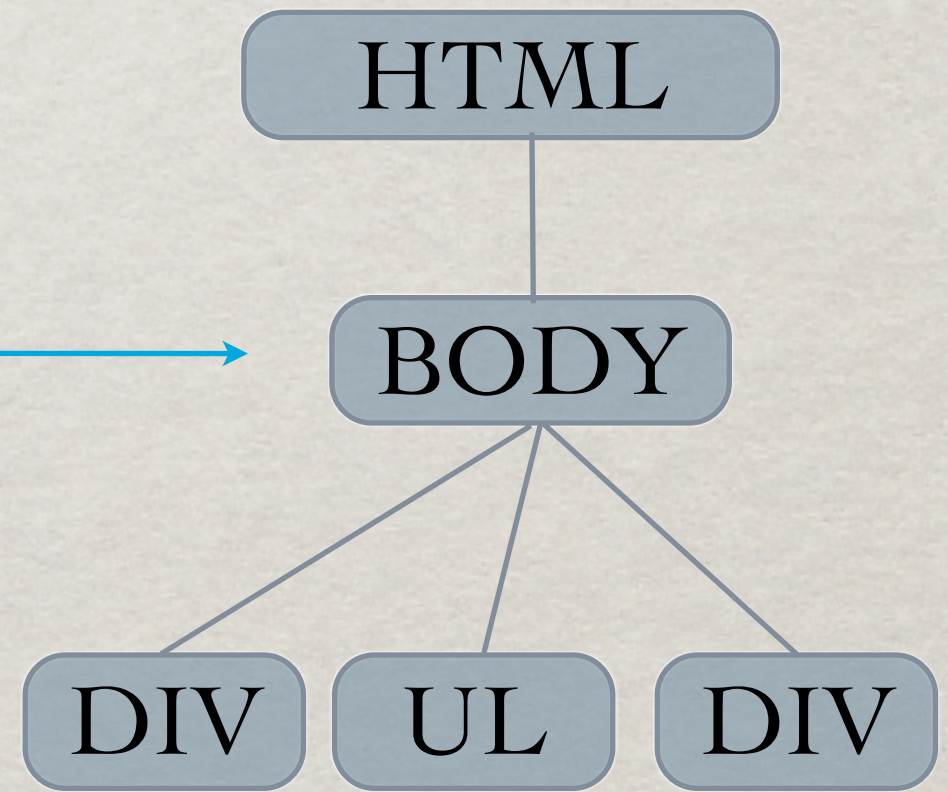
4   H1.logo   LI   LI   LI

6   7   8

Comparing DOMs

Reference Page

Comparison Page

Heuristics

* Ignore hidden elements

* Ignore location of occluded elements

* Handle opacity state of slideshows

Detect Issues, Not Differences

Want to be the first to know about the launch of our upcoming apps?

Add your email address here...   Submit

* What's positioned incorrectly here?

    * Form

    * Text input

    * Submit button

Detect Issues, Not Differences

Want to be the first to know about the launch of our upcoming apps? | *Add your email address here...* | Submit

Want to be the first to know about the launch of our upcoming apps?
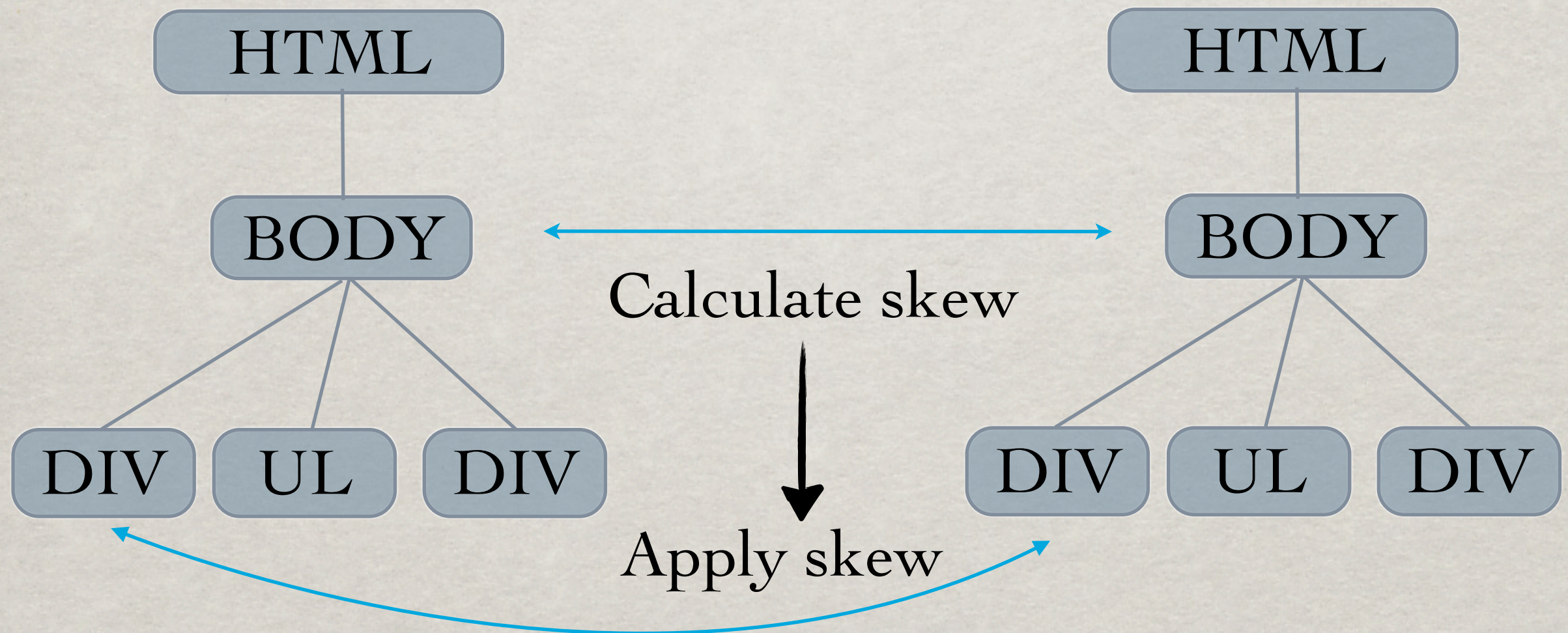*Add your email address here...* | Submit

- What's really the issue?

  - The form elements are fine

  - The form wraps around

Apply Skew to Sub-search

Reference Page

Comparison Page

HTML

BODY

DIV UL DIV

Calculate skew

Apply skew

HTML

BODY

DIV UL DIV

Other Considerations

* Tolerance threshold

* DOM mismatches

* Authentication

Results

- Developer friendly

- CSS selectors

- Error dimension

- Error value

Sample Result

Sample Results

Multi-dimensional

* Cross-browser

* Regression

* Internationalization

* Bandwidth constraints

No Programming Required

* Adaptable

  * The reference page is the set of rules

* Everyone can test

  * Just type in a URL

* No test maintenance required

Recap

* Ensure a consistent user experience

* Match developer testing habits

* Match customer viewing expectations

* Provide intelligent results

* Reduce conceptual & cost overhead

The End

* Q & A

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* http://webconsistencytesting.com/