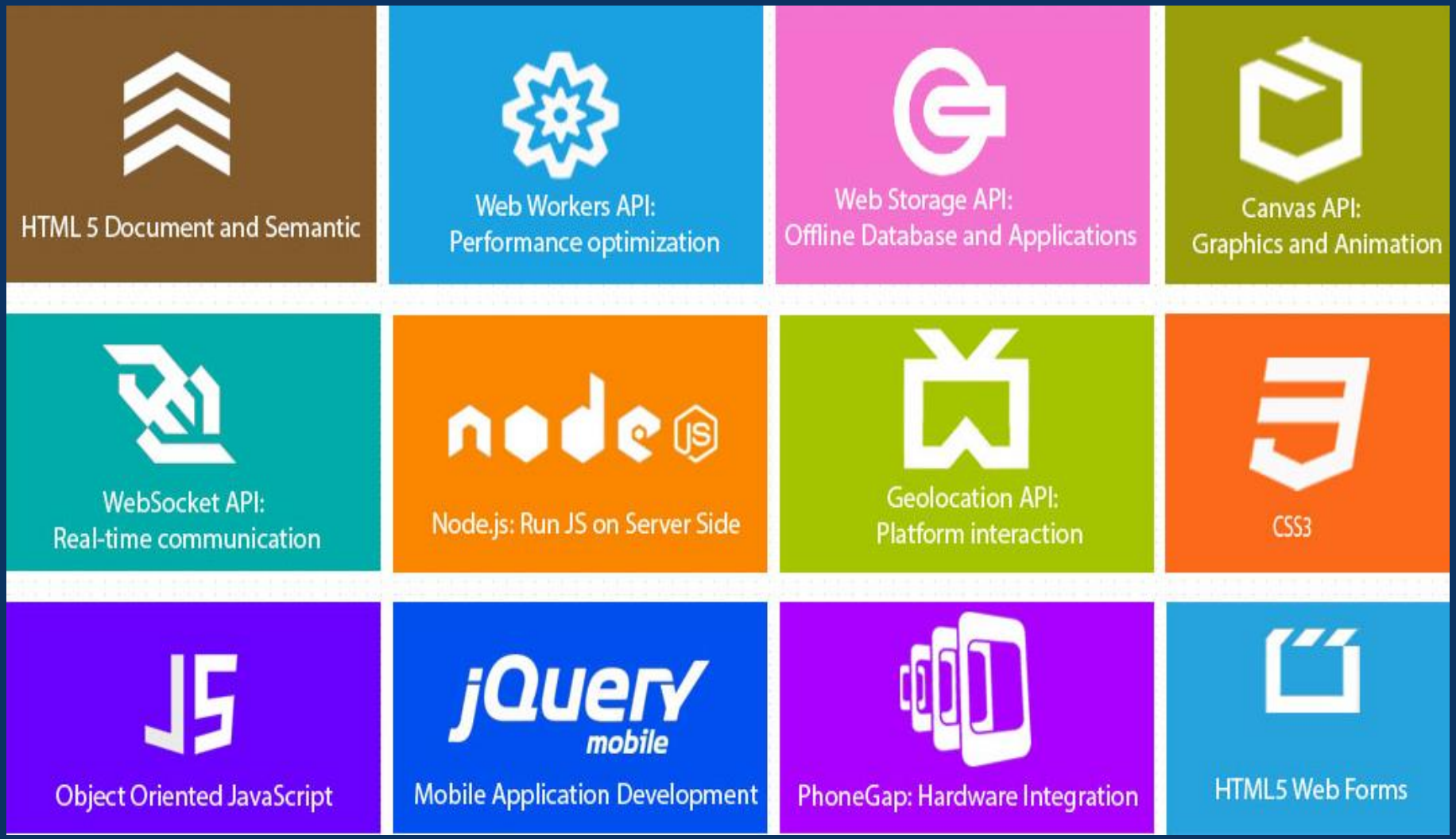
CrossPlatform

Cloud Base Application Development

The new World of Development

Zulqarnain Hashmi

Training Agenda

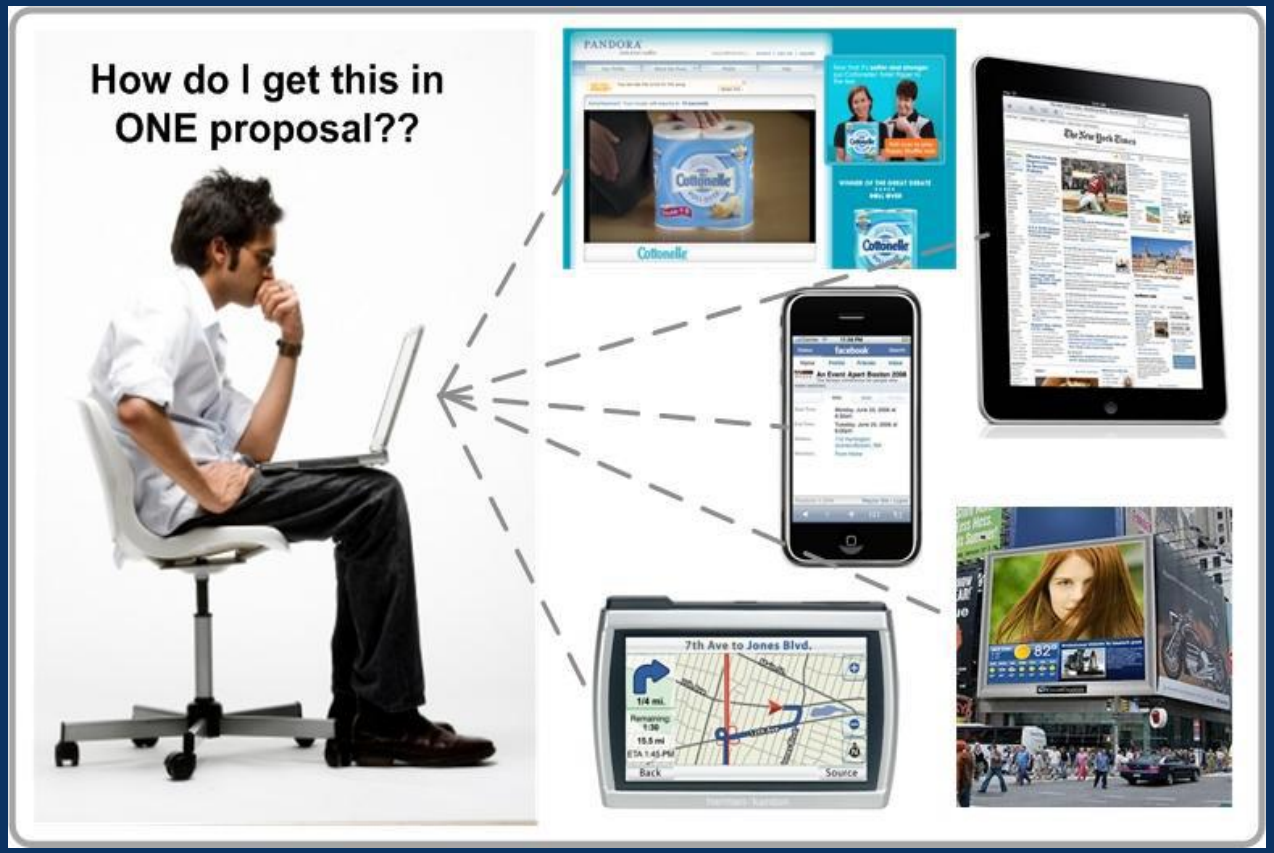


What's In This Lecture For You

- What is HTML5? Is it ready yet?
- What is HTML5 vision?
- What are the top features of HTML5?
- Which clients support HTML5?
- Can we use HTML5 in our company?
- What tools and libraries work with HTML5?

Cross-Platform R&D Challenge

- Designing for multiple platforms
- Implementing for multiple platforms
- Testing in multiple platforms



HTML 5

HTML5 was designed
(among other things)
to solve the multiple-platforms problem

HTML5 = Next Generation Features for Modern ~~web~~/App Development
HTML5 ~= HTML + CSS + JS APIs

Verbatim-Word on the street

"The world is moving to HTML5"

—Steve Jobs, Apple

"The Web has not seen this level of transformation, this level of acceleration, in the past ten years… we're betting big on HTML5"

—Vic Gundotra, VP of Engineering, Google

"If you want to do something universal, there is no question, the world is going HTML5. That is clear…The world is just pushing down this HTML5 path and so are we.

—Steve Ballmer, CEO Microsoft

"I had no idea there was so much HTML5 already in play"

—Tim O'Reilly

HTML 5 Standards Bodies

- Web Hypertext Application Technology Working Group (WHATWG)
  - Founded in 2004 (by individuals working for browser vendors Apple, Mozilla, Google, and Opera)
  - Develops HTML and APIs for web application development
  - Unofficial and open collaboration of browser vendors and interested parties
- World Wide Web Consortium (W3C)
  - Created draft of HTML5 in 2008
- Internet Engineering Task Force (IETF)
  - Protocols (HTTP, WebSocket)

HTML 5 Specifications

- WHATWG
  - http://www.whatwg.org/specs/web-apps/current-work/
- W3C
  - http://dev.w3.org/html5/spec/Overview.html
- IETF (WebSocket specification)
  - http://tools.ietf.org/html/draft-hixie-thewebsocketprotocol

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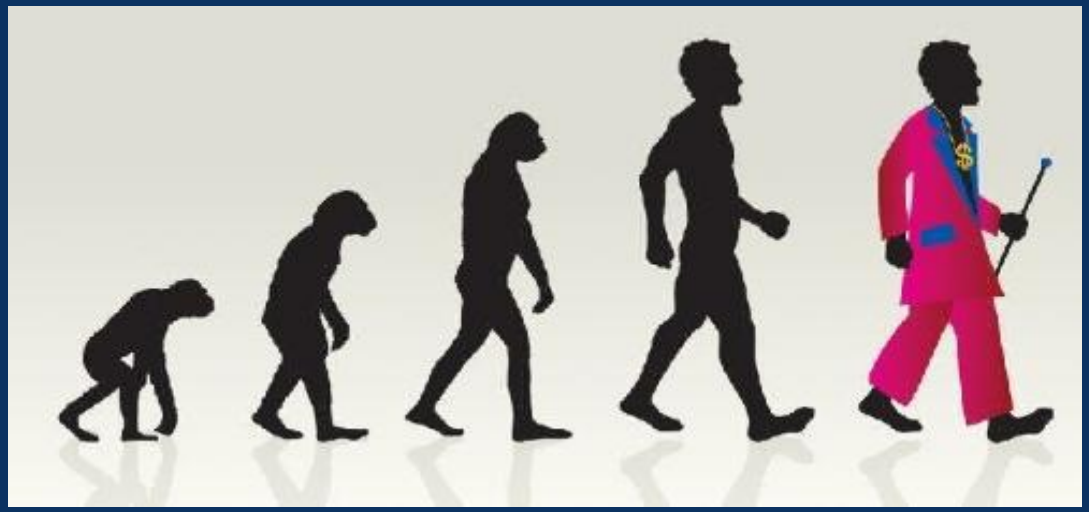
Rough Timeline of Web Technologies

- 1991 HTML
- 1994 HTML 2
- 1996 CSS 1 + JavaScript
- 1997 HTML 4
- 1998 CSS 2
- 2000 XHTML 1
- 2002 Tableless Web Design
- 2005 AJAX
- 2009 HTML 5
- 2022 HTML 5 Final specification



HTML5 Vision and Guiding Principles

- Compatibility
- Utility
- Interoperability
- Universal Access
- Simplicity
- Plugin Free paradigm

Compatibility

- Support existing content
- Solve real problems
- Evolution not revolution
- Don't reinvent the wheel (or at least make a better one!)

Utility

- Secure by design
- DOM consistency (HTML5 and XHTML5)
- Separation of presentation and content

Presentation vs. Content

- HTML5 strives to separate content from presentation where possible (use CSS)
- Most of the presentational features from earlier versions of HTML are no longer supportedThis was already in the works (HTML4 Transitional, XHTML1.1)

- Problems with presentational markup:
  - Poor accessibility
  - Unnecessary complexity
  - Larger document size

Interoperability

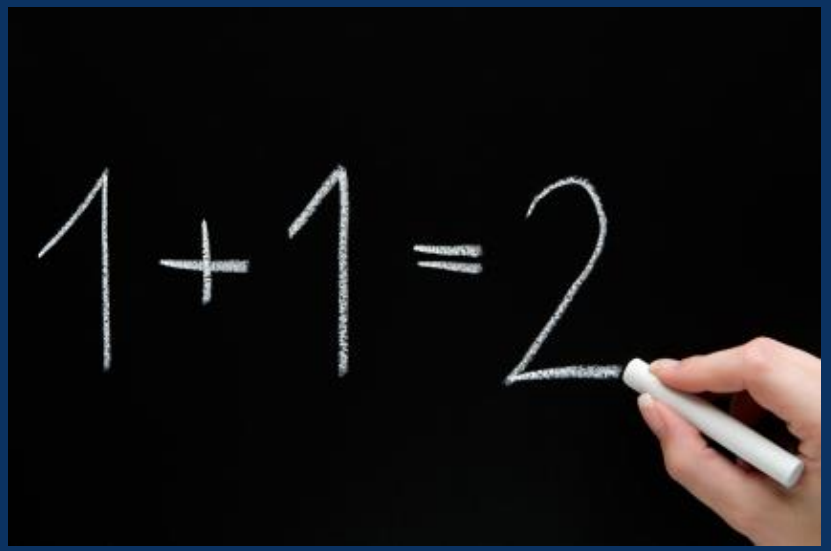
- Specify well-defined behavior
- Specific instead of vague

- •Handle errors well
  - Improved and ambitious error handling plans
  - Prefer graceful error recovery to hard failure

- •Avoid needless complexity
  - Simple is better

Simplicity

- Simplify wherever possible and Simple is Better
- Examples:
  - Native browser ability instead of complex JavaScript code
  - New doctype
  - Character set
  - HTML5 APIs



Universal Access

- Support for all world languages
- Accessibility
  - Support users with disabilities
- Web Accessibility Initiative (WAI) Accessible Rich Internet Applications (ARIA)
- WAI-ARIA roles can be added today
- Supported by screen readers

Plugin-Free Paradigm

- HTML5 provides *native* support for many features that were only possible with plugins or complex hacks (drawing API, sockets)
- Problems with plugins:
  - Plugins may not be installed
  - Plugins can be disabled or blocked (iPad does not ship with Flash plugin)
  - Plugins are a separate attack vector
  - Plugins are difficult to integrate with the rest of an HTML document (plugin boundaries, clipping, and transparency issues)

Is HTML 5

- Language
- Technology
- Plateform

Is HTML 5

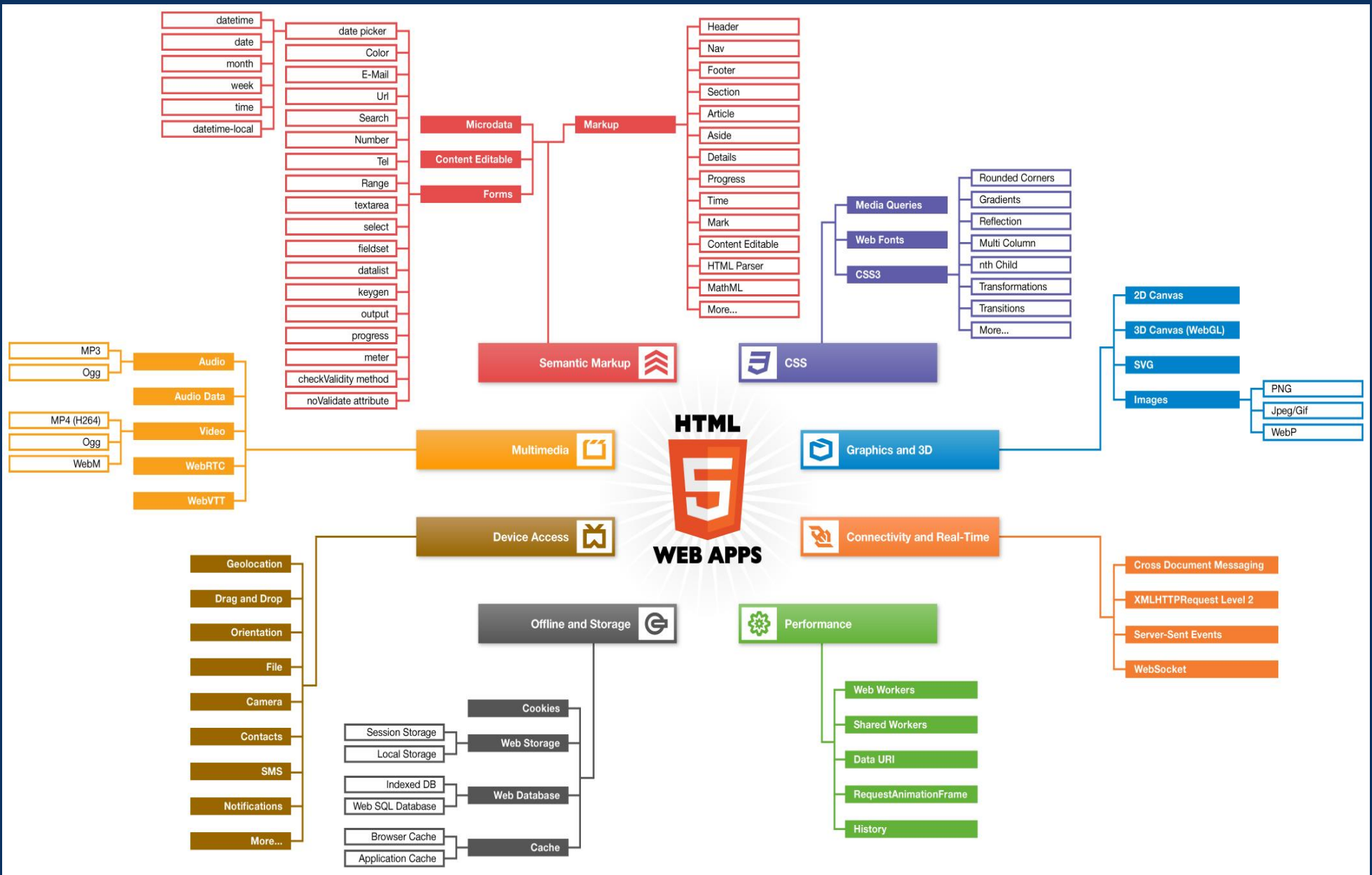
- Language
- Technology
- Plateform

HTML5 Feature Areas

"HTML5 should not be considered as a whole. You should pick the technology that suits the solution to your problem."

—Remy Sharp (Co-Author *Introducing HTML5*)

HTML5 Feature Areas



Semantics

Semantics

- Keep it simple (Example doctype)
- Structural meaning
- Richer Set of Tags
- Eliminated Several Tags too
- Microdata

Simplified DOCTYPE

HTML4/XHTML

- HTML 4.01 Strict
- HTML 4.01 Transitional
- HTML 4.01 Frameset
- XHTML 1.0 Strict
- XHTML 1.0 Transitional
- XHTML 1.0 Frameset
- XHTML 1.1

```
<!DOCTYPE HTML PUBLIC "-//W3C//DTD HTML 4.01
Transitional//EN"
"http://www.w3.org/TR/html4/loose.dtd">
```

HTML5

```
<!DOCTYPE html>
```

Simplified Character Set

HTML4

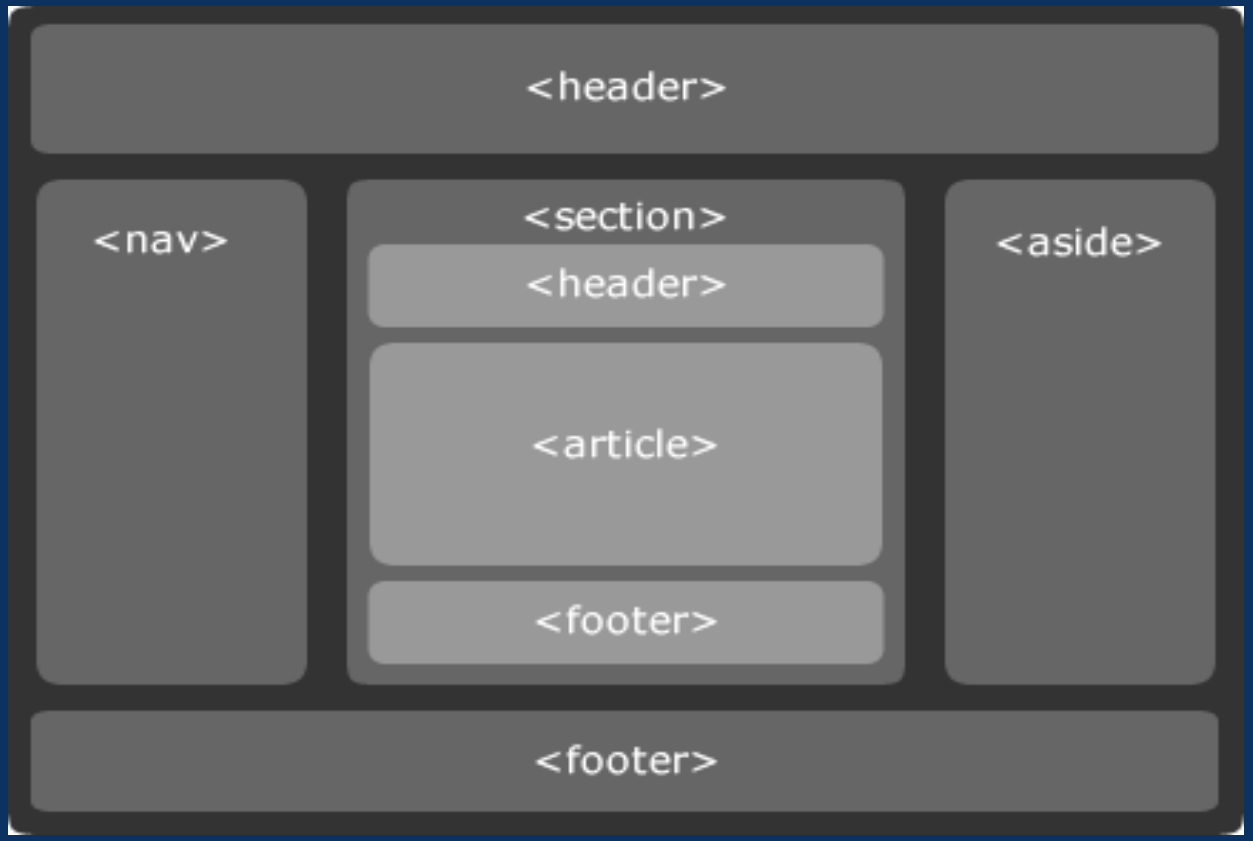
```
<meta http-equiv="Content-Type"
content="text/html; charset=utf-8">
```

HTML5

```
<meta charset=utf-8>
```

Semantics

- <header>
- <nav>
- <section>
- <article>
- <footer>
- <aside>



Semantics - Microdata

```
<section> Hello, my name is Zulqarnain Hashmi, I am Lecturer at IIU. I live at PWD, Islamabad.</section>
```

Markup with added by schema.org Microdata to support web semantics :

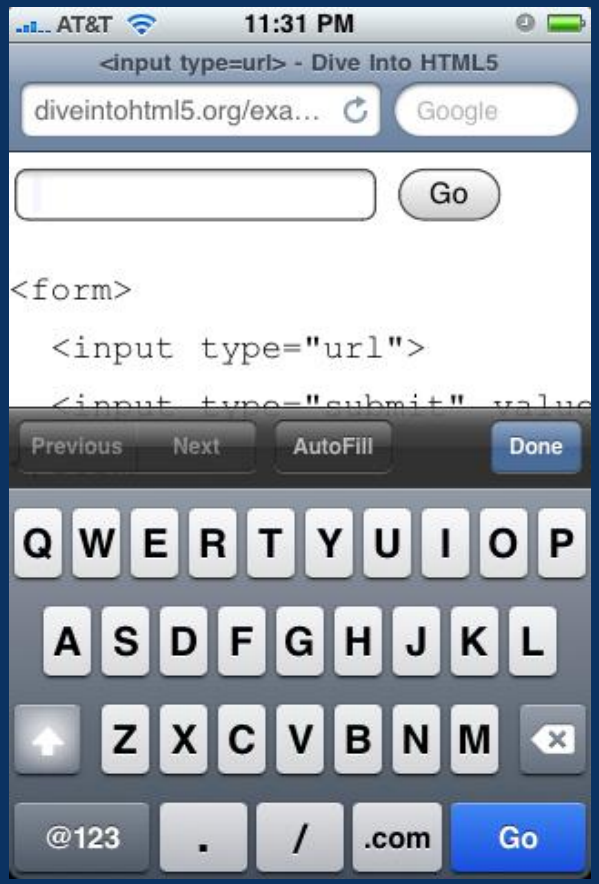
```
<section itemscope itemtype="http://schema.org/Person"> Hello, my name is
<span itemprop="name">Zulqarnain</span>, I am a
<span itemprop="jobTitle">Lecturer</span> at the
<span itemprop="affiliation"> IIU</span>.

<section itemprop="address" itemscope
itemtype="http://schema.org/PostalAddress"> I live at <span
itemprop="streetAddress">PWD</span>, <span
itemprop="addressRegion">Islamabad</span>. </section> </section>
```

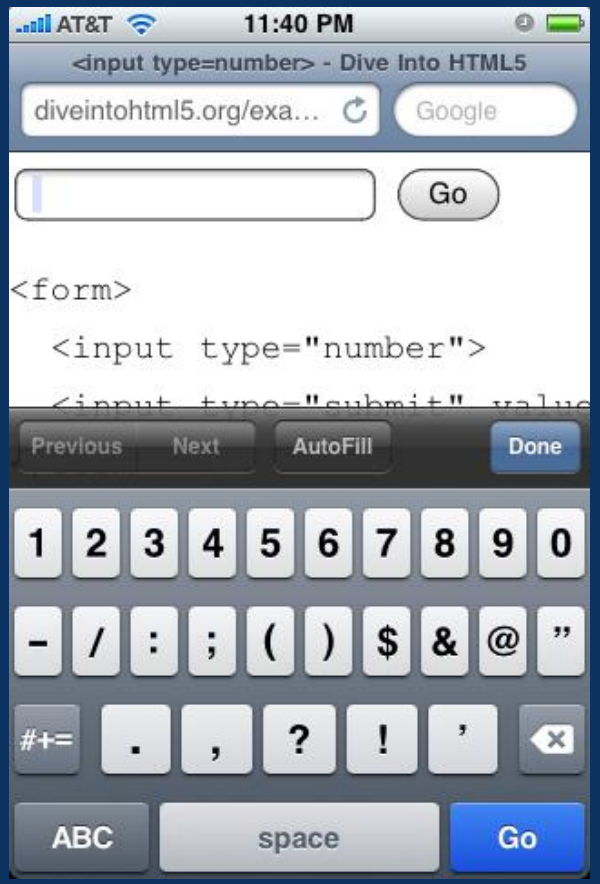
Forms

- Aims to make development and usage of forms easier. No Javascript required.
- Input Types
  - email
  - phone
  - url
  - date, datetime, month, week, time, datetime-local)
  - color
  - search
  - number and range

Forms


AT&T
11:31 PM
<input type=url> - Dive Into HTML5
diveintohtml5.org/exa…
Google
Go
<form>
<input type="url">
Previous
Next
AutoFill
Done
Q W E R T Y U I O P
A S D F G H J K L
Z X C V B N M
@123
.
/
.com
Go

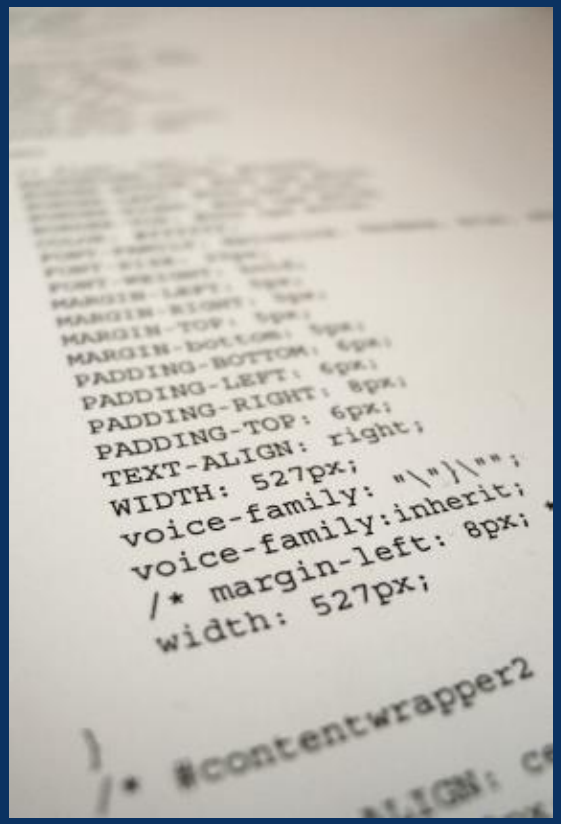

AT&T
11:40 PM
<input type=email> - Dive Into HTML5
diveintohtml5.org/exa…
Google
Go
<form>
<input type="email">
Previous
Next
AutoFill
Done
Q W E R T Y U I O P
A S D F G H J K L
Z X C V B N M
_123
space
@
.
Go


AT&T
11:40 PM
<input type=number> - Dive Into HTML5
diveintohtml5.org/exa…
Google
Go
<form>
<input type="number">
Previous
Next
AutoFill
Done
1 2 3 4 5 6 7 8 9 0
- / : ; ( ) $ & @ ”
#+=
. , ? ! ’
ABC
space
Go

CSS3

CSS Level 3

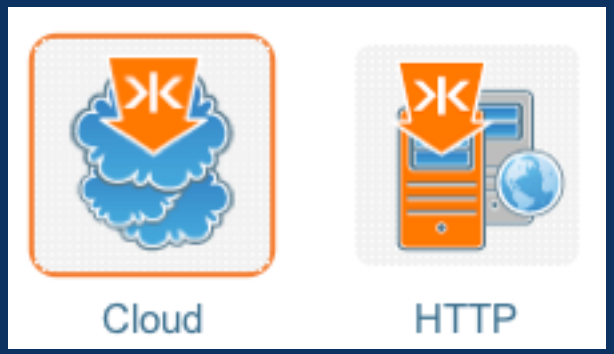
- Modularized for easier browser uptake
- Almost 50 modules (readiness varies)
- Use browser-specific prefixes until finalized
- Dramatically improves performance
- Examples:
  - Border radius (rounded corners) without images
  - Gradients
  - Multi-column layout
  - Transformations and transitions
  - Web Fonts
  - Media Queries



Rounded corners

CSS

```
a:hover img {
        border-radius: 10px;
        border: 2px solid #F47D31;
        -webkit-transform: scale(1.05);
}
```



Web Fonts

HTML

```
<html>
<head>
  <link rel="stylesheet" type="text/css"
href="http://fonts.googleapis.com/css?family=Tangerine">
    <style>
      h1 {
        font-family: 'Tangerine', serif;
        font-size: 48px;
       }
    </style>
</head>
<body><h1>Making the Web Beautiful!</h1></body>
```

http://code.google.com/apis/webfonts/docs/getting_started.html#Quick_Start

Media Queries

CSS

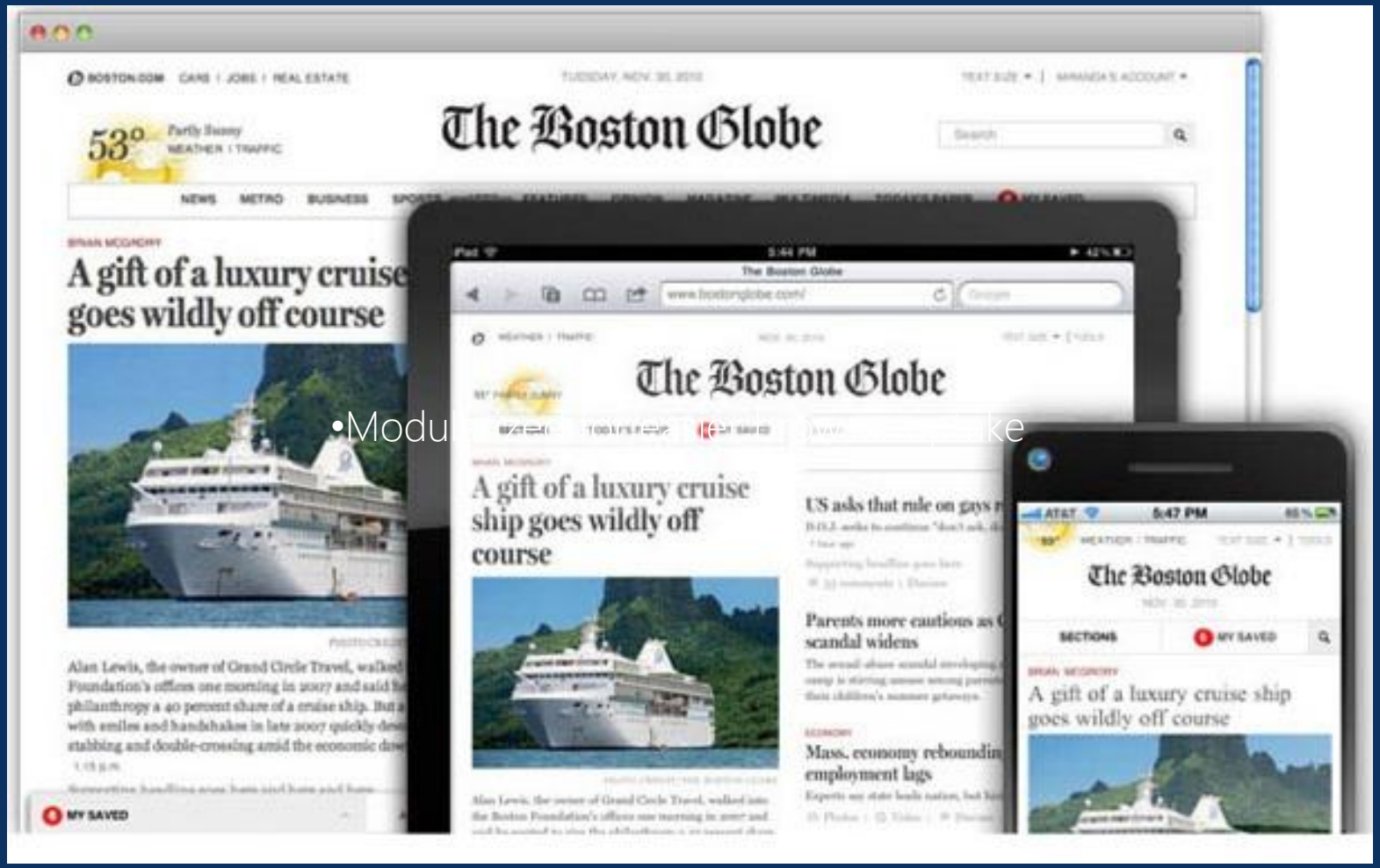
```
/* Media-specific sections of stylesheet */

@media all and (orientation:landscape) {
/* e.g. rotated smartphone */
}

@media screen and (max-device-width: 480px) {
 /* small screen */
}

@media print {
 /* drop navigation elements that make no sense on paper */
 nav { visibility:hidden; }
}
```

Responsive Web Design



http://www.boston.com/bostonglobe/features/

Canvas API and 3D

Canvas API

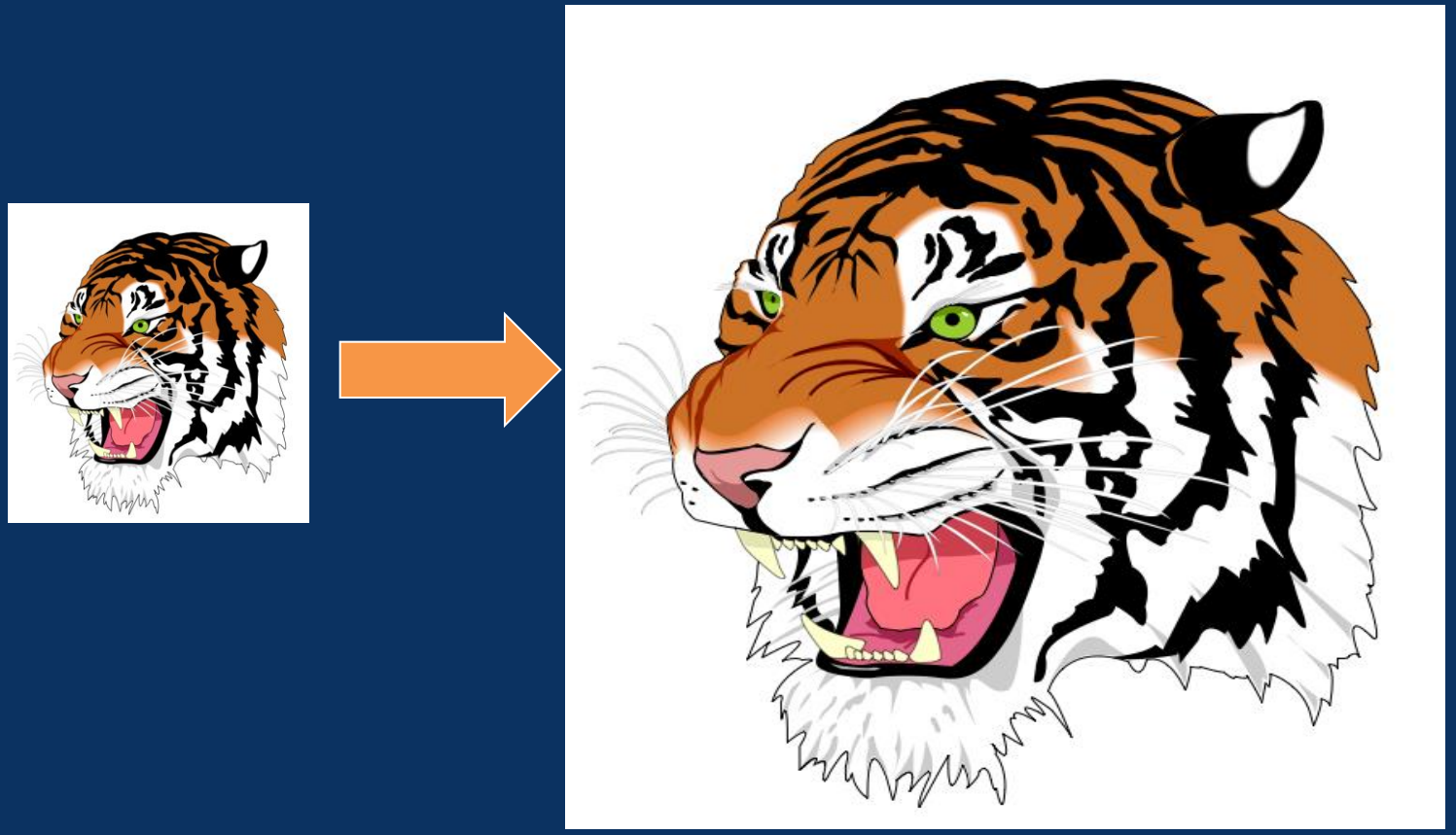
- 2D Drawing API (Previously possible only with plugins (Flash, Silverlight)
- Integrated into HTML5 documents (part of DOM)
- Functions : line, arcs, rectangle, fills
- Allows styling via CSS
- Allows control via Javascript
- Charts, Animation, Images and other complex rendering
- Canvas supports 2D and 3D (WebGL)

SVG

- SVG stands for Scalable Vector Graphics.
- SVG is used to define vector-based graphics for the Web.
- SVG defines the graphics in XML format.
- SVG graphics do NOT lose any quality if they are zoomed or resized.
- Every element and every attribute in SVG files can be animated
- Nearly all browsers support

SVG

- "Scalable" Vector Graphics (not bitmaps)



http://www.croczilla.com/bits_and_pieces/svg/samples/tiger/tiger.svg

Multimedia

Multimedia: HTML5 Audio and Video

- Audio and video are first class citizens in the HTML5 web
- A plug-in free world
  - Programmable with JavaScript
  - Style with CSS
- Codec support varies, but multiple source elements and fallback content can be used
- Complete JavaScript API available

Audio / Video

- Simple tags : <video>, <audio>
- Even Simpler usage:

```
<video src="demo.mp4"></video>
<audio src="song.mp3"></audio>
```

- Control via APIs
  - Play
  - Pause
  - Stop

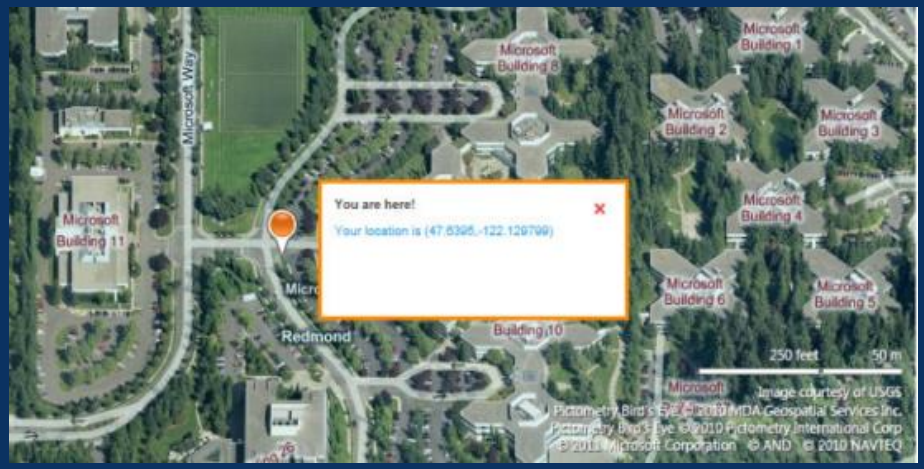
Device Access

Device Access

- Geolocation API
- Drag and Drop
- Filesystem API
- Speech Input
- Device orientation
- Accelerometer
- Webcam (bar code, QR code scanning)
- Audio devices (speech input)
- Local data such as contacts & events

Geolocation API

- Determine where the device is. Find it right in the browser.
- Useful for providing location based services.
- User should be allowed to opt in.
- API allows for both : one time location and continuous location.



Offline and Storage

Offline & Storage

- Web Apps can start faster and work even if there is no internet connection, thanks to the HTML5 App Cache, as well as the Local Storage, Indexed DB, and the File API specifications.

Storage API

- Allows local storage of application data
- 5MB – 10MB per domain
- Key component to offline usage
- Types of Storage options:

Storage API

- Simple API for storing values in easily retrievable JavaScript objects which persist across page loads
  - window.localStorage
  - getItem(key)
  - setItem(key,value)

HTML5 – Offline Cache

- Network is not available all the time.
- The application must be available even if the server is done.
- Application Cache to the rescue.
- Stores the specified resources (HTML,CSS,JS) on the client.
- Combine Application Cache with Offline Storage to provide availability.

Connectivity

Other HTML5 features

- Performance & Integration : Web Workers
- ContentEditable
- Cross Document Messaging
- Browser History Management

HTML5 Developer Tools

Developer Tools

- http://www.html5test.com
  How Well does your browser support HTML5?

- http://caniuse.com/
  Compatibility tables for support of HTML5, CSS3, SVG and more in desktop and mobile browsers.

- http://mobilehtml5.org/
  HTML5 compatibility on mobile and tablet browsers

Browser Developer Tools

Browser	Built-In Tool	Mac Shortcut	Windows Shortcut
Chrome	Developer Tools	Command + Option + J	CTRL + Shift + J
Firefox	Firebug	F12	F12
Opera	Dragonfly	Command + Option + I	CTRL + Shift + I
Safari	Web Inspector	Command + Option + I	CTRL + Alt + I
Internet Explorer	Developer Tools		F12

State of HTML5 – Recommendation

- Differing browser support & behaviour
- Use sites like HTML5Test.com, CanIUse.com to understand Browser support for HTML5
- Fallback behaviour is important
- Great time to get started today!
- Be prepared for changes
- All vendors are supporting it

References

- http://diveintohtml5.info
- http://www.html5rocks.com
- http://html5demos.com
- http://es.slideshare.net/peterlubbers/getting-started-with-html5-in-tech-com-stc-2012
- http://www.html5test.com
  How Well does your browser support HTML5?
- http://caniuse.com/
  Compatibility tables for support of HTML5, CSS3, SVG and more in desktop and mobile browsers.

Questions