

Mobile Web

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Overview

- **Introduction**
 - Facts and figures
 - Mobile web ecosystem
 - Currents trends
- **Principles**
 - Information Architecture
 - Design and Development
- **Development**
 - Native vs. Web
 - HTML 5 + CSS3 = True mobile
- **Frameworks**
 - PhoneGap
 - Appcelerator
- **The future**
 - Challenges



Introduction

- Mobile phones are becoming the largest internet clients.
- Current mobile devices are more resembling the regular computers.
- Most of the current smartphones run on ARM due to its best MIPS/Watt ratio.
- Smartphones today are becoming “sensor packed devices”.



Fact and figures: Statistics

- More then 5 billion mobile subscribers world wide
- 3 times more then a number of PCs
- No. of subscribers/number of population is >1 in the industrialized countries.
- 20 % of the mobile subscribers are considered to have a Smartphone
- More the 300 million smartphones were shipped during 2010. A 75% increase from the previous year.

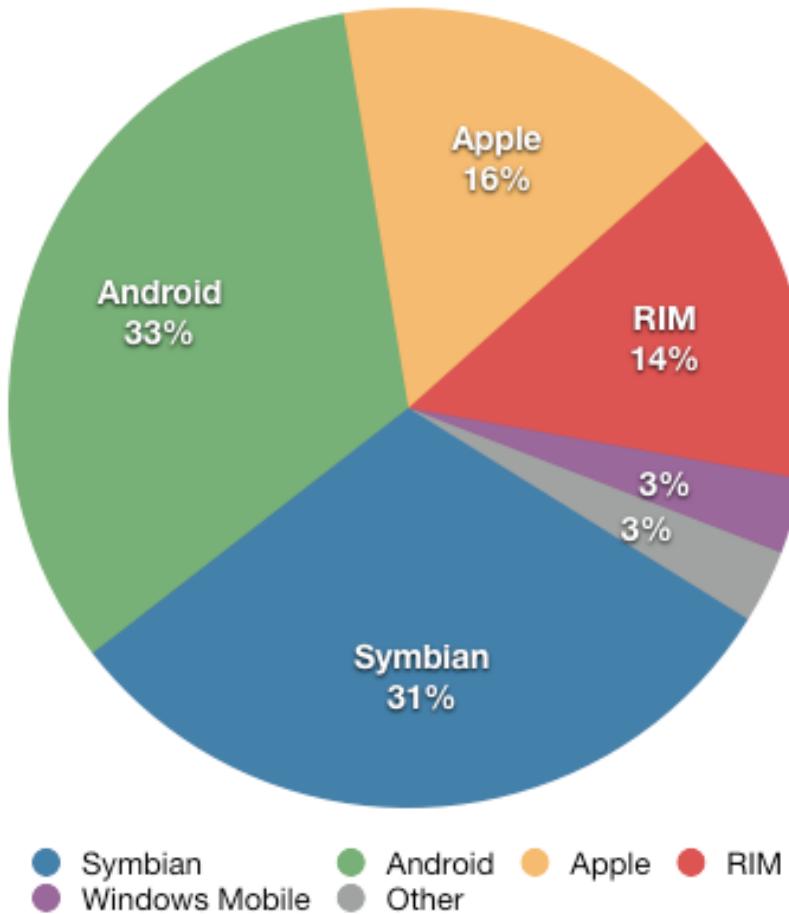


Facts and figures: Resources

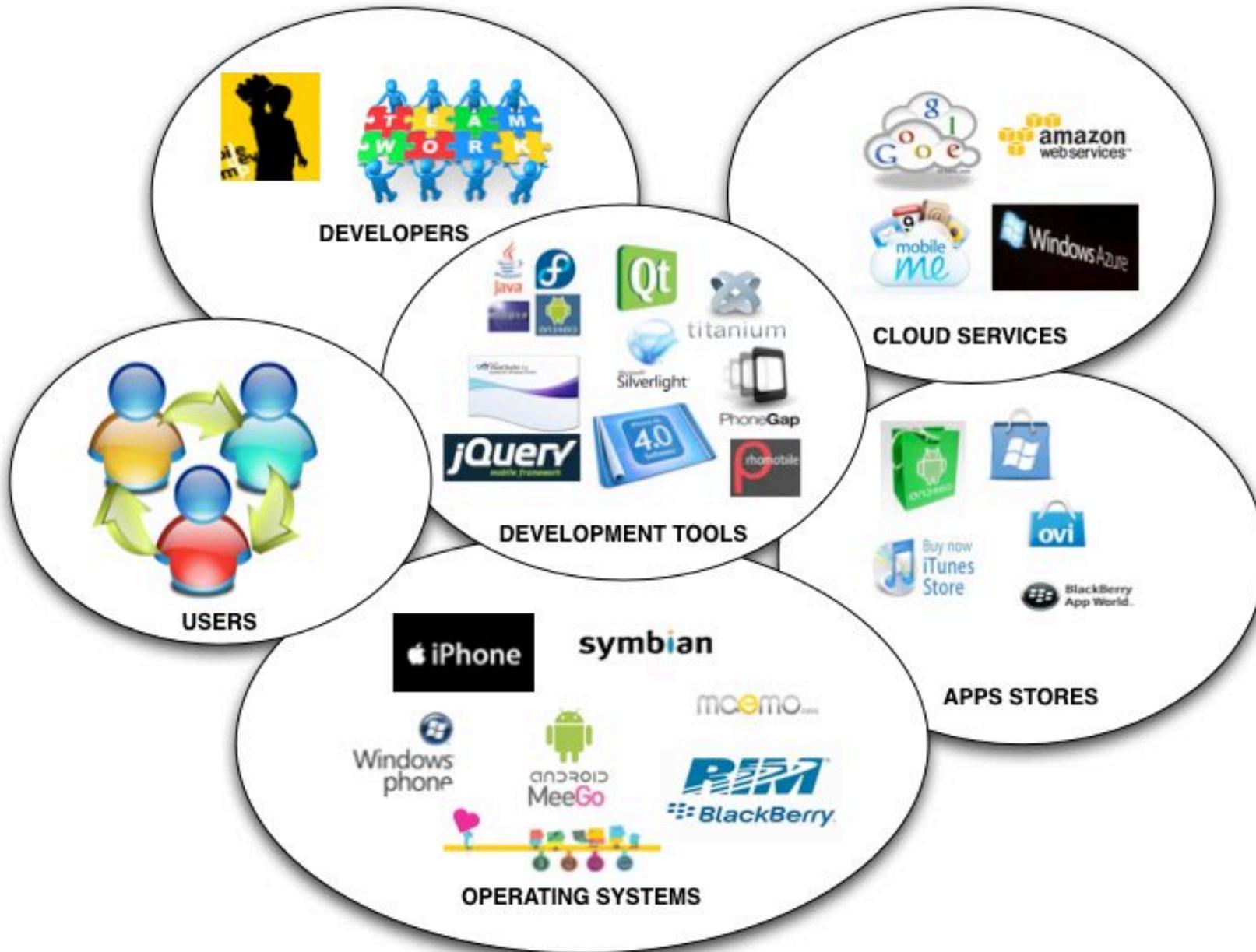
- 3-6 times less processing power
- 8-12 times less memory
- 5-8 times less storage capacity
- 10-12 times less network bandwidth



Smartphone OS share (*source*: Catalyst 2011)



Mobile Web Ecosystem



Current Trends

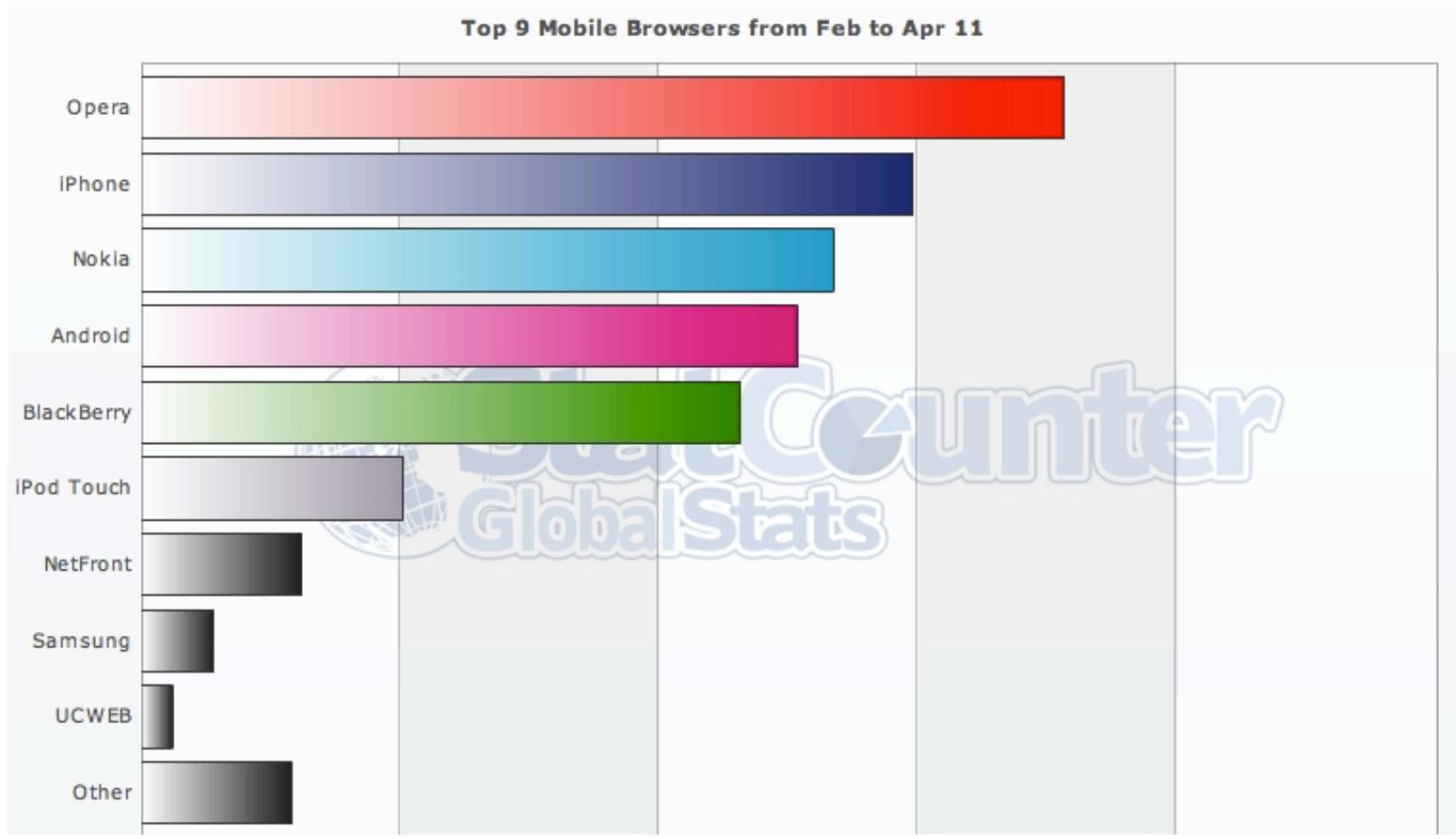
- App everything – single purpose (exponential growth in number of apps)
- Multiplatform approach (developing app for each platform)
- Ubiquitous connectivity – cloud dependent
- “In app” purchasing and advertising
- “Horizontal” model for revenues



Mobile Web - Principles



Mobile Browsers



Mobile Browsing

- Focus navigation
- Cursor navigation
- Touch navigation
- Multitouch navigation



Mobile Web History

- WAP 1.0
 - First start of Mobile internet in 1999 – 2000
 - WML
- WAP 2.0
 - Was released in 2002
- .mobi era
 - Top-level domain (TLD) approved by the Internet Corporation for Assigned Names and Numbers (ICANN) in 2005
- Mobile Web 2.0
 - Started in 2007 with the introduction of Smartphones
 - Use of AJAX, RIA, GeoLocation, Social Networking



Information architecture

- **Low-end devices**

Basic XHTML markup, maximum screen width of 176 pixels, basic CSS support (text color, background color, font size), no JavaScript

- **Mid-end devices**

Basic XHTML markup, average screen width of 240 pixels, medium CSS support (box model, images), basic JavaScript support (validation, redirection, dialog windows)

- **High-end devices**

XHTML or HTML 4 markup, average screen width of 240 pixels, advanced CSS support (similar to desktops), Ajax and DOM support, optional touch support, optional orientation change support (for an average screen width of 320 pixels)

- **Advanced smartphones**

HTML 5, large screen size and high resolution, touch support, support for CSS extensions (animations, effects) and Ajax, storage, geolocation

- **Old devices**

WML



Design and Usability

- Avoid horizontal scrolling.
- Maintain visual consistency with your desktop site, if you have one.
- Reduce the amount of text.
- Use legible fonts on every screen; don't rely on the resolution.
- Maintain the total link count at no more than 10 per page.
- Minimize the amount of user text input required.
- Use lists rather than tables.
- Official UI guidelines:
<http://www.mobilexweb.com/blog/ui-guidelines-mobile-tablet-design>

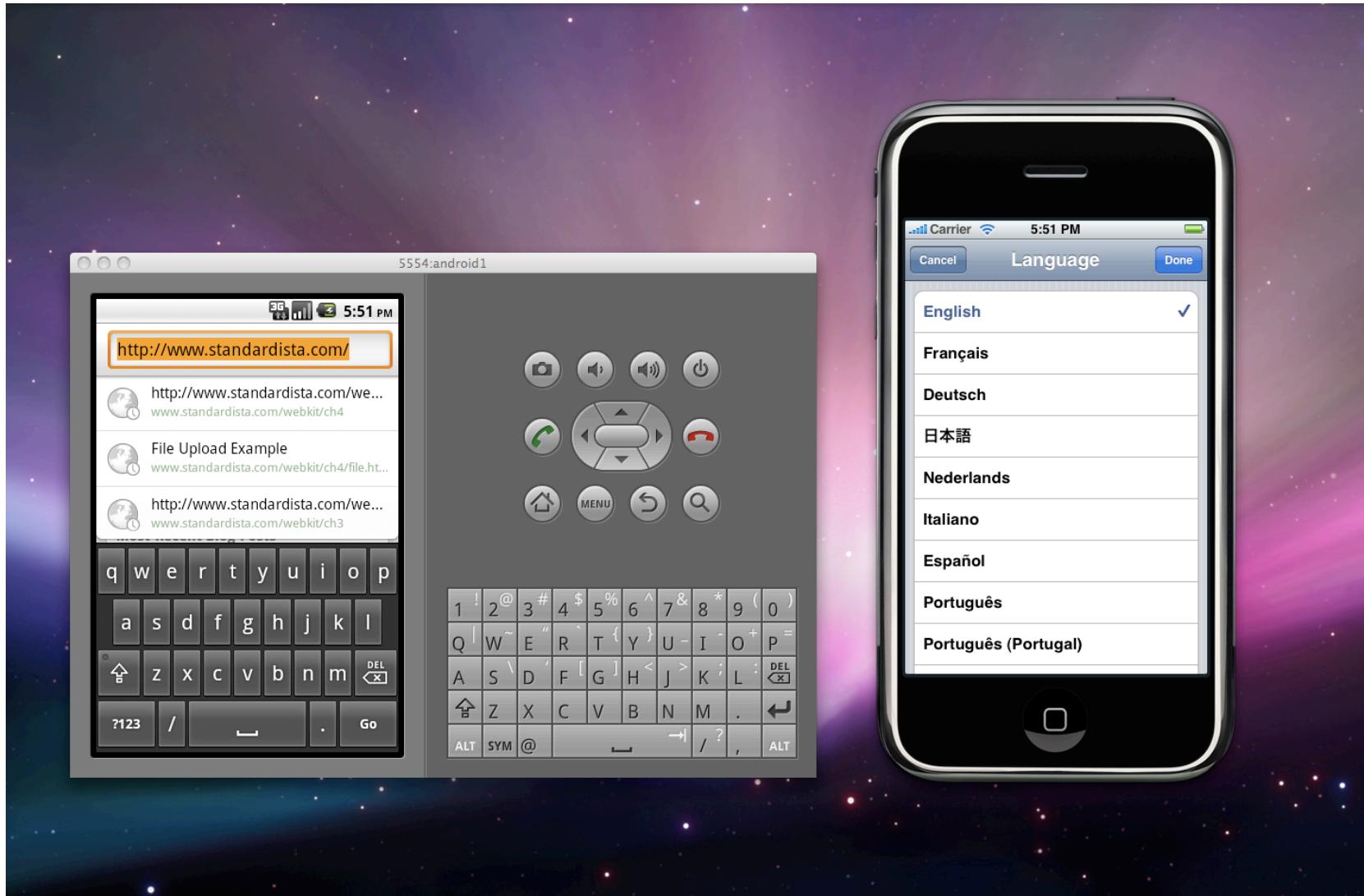


Emulators

- Best way to learn is to try ☺
- All major players have provided the simulators of their platforms
- Link to all 35 simulators available
<http://www.mobilexweb.com/emulators>



Mobile Emulators



Mobile Web - Development



Native or Web?

	Native	Web	Depends
Cosmetics	✓		
Functionality	✓		
Development			✓
Testing		✓	
Distribution		✓	
Payment			✓
Support		✓	



With HTML5 and CSS3

	Native	Web
Cosmetics	✓	✓
Functionality	✓	✓*
Development		✓
Testing		✓
Distribution		✓
Payment		✓
Support		✓



CSS3 Properties

- CSS3 Selectors
- HSLA / RGBA
- Multiple backgrounds
- Background-size
- Border-radius
- Border-image
- Text Shadow
- Box Shadow
- Opacity
- Text-overflow
- Gradients
- Transforms
- Columns
- Animations
- Transitions
- Border-image
- Reflections
- @font-face



HTML5 APIs

- Local Storage
- Session Storage
- WebSQL dB
- Offline Applications
- GeoLocation
- postMessage
- Query selector
- Drag & Drop
- <canvas>,
<svg>,
<audio>,
<video>
- Web Forms



HTML5 <input> Types

date /

time /

datetime /

datetime-local /

month /

week

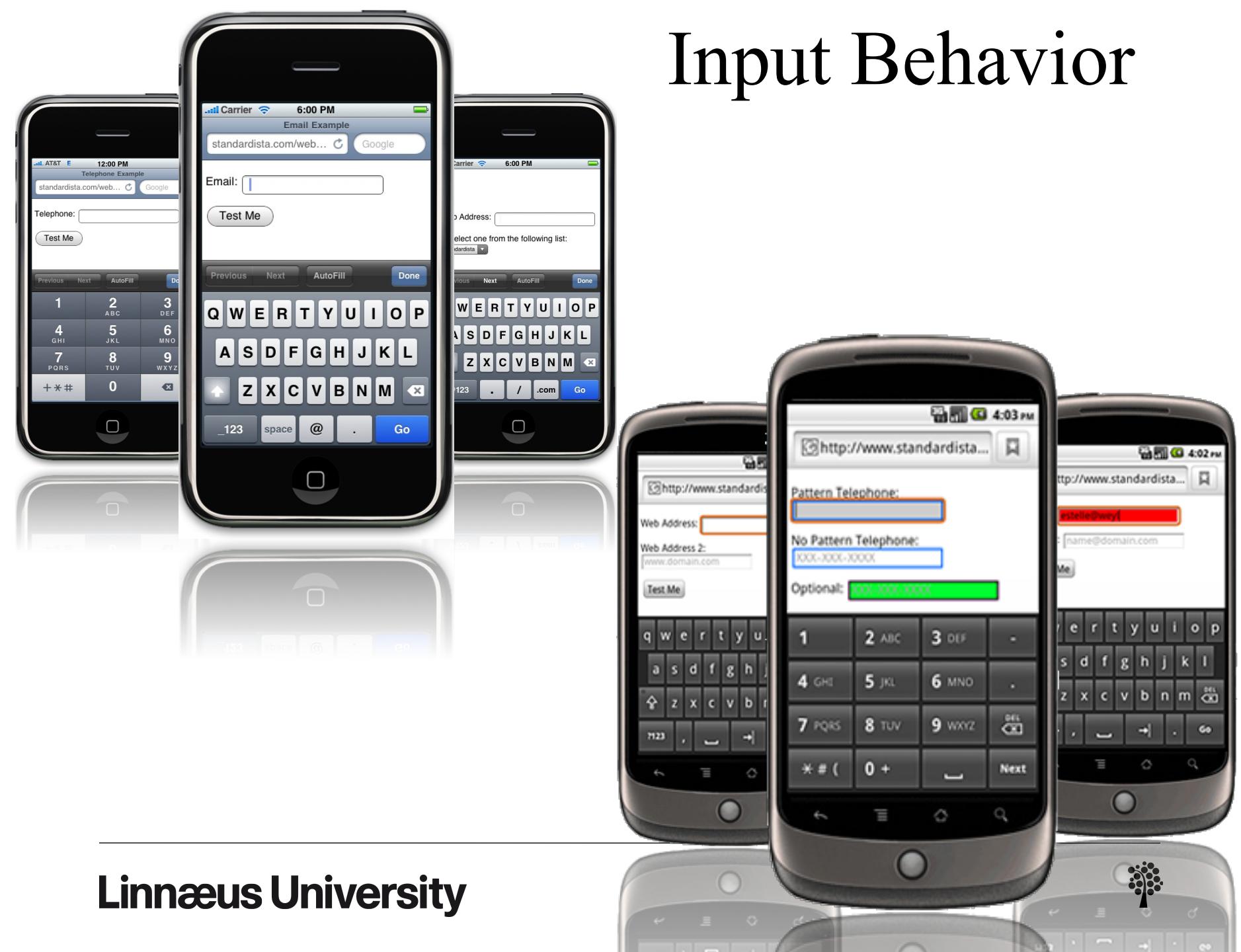
email

url

- Tel
- Number
- Range
- search



Input Behavior



Media Queries

- Feature in CSS 3
- Rather than looking for a *type* of device they look at the *capability* of the device:
 - width and height (of the browser window)
 - device width and height
 - orientation – for example is a phone in landscape or portrait mode?
 - resolution
- Example: <http://mediaqueri.es/popular/>



```
19
20 <!--[if !IE]><!--
21 &lt;link media="only screen and (max-device-width: 480px)"
22   href="smalldevice.css" rel="stylesheet" /&gt;
23 &lt;style&gt;
24 @media all and (orientation: portrait) {
25   body {
26     background-color: red;
27   }
28 }
29 @media all and (orientation: landscape) {
30   body {
31     background-color: blue;
32   }
33 }
34 &lt;/style&gt;
35 &lt;!--&lt;![endif]--&gt;</pre>
```

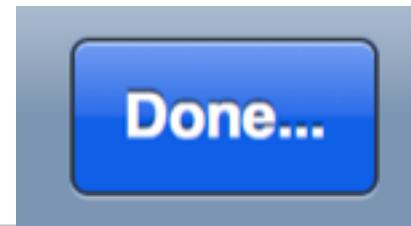
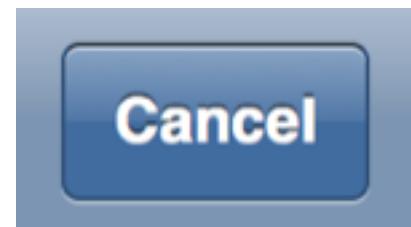
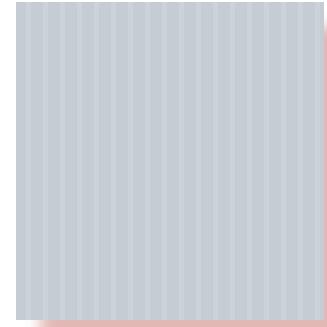


```
1 <!DOCTYPE html>
2 <html>
3 <head>
4 <meta charset="UTF-8" />
5 <title>iPhone Look and feel</title>
6 </head>
7 <body>
8     <header>
9         <ul>
10            <li class="button cancel">
11            <li class="button done">Do
12        </ul>
13        <h1>Languages</h1>
14    </header>
15    <article>
16        <ul>
17            <li lang="en-us">English</
18            <li lang="fr-fr">Français<
19            <li lang="es-es">Español</
20        </ul>
21    </article>
22 </body>
23 </html>
```



Gradients

```
1 body {  
2     background-color:#C5CCD4;  
3     background-image: -webkit-gradient(linear,  
4         left top, right top,  
5         color-stop(0.7142, #C5CCD4),  
6         color-stop(0.7142, #CBD2D8));  
7     -webkit-background-size:7px 1px;  
8     background-size:7px 1px;  
9     background-repeat:repeat;  
10 }  
11 header {  
12     background-color: rgb(109, 132, 162);  
13     background-image: -webkit-gradient(linear,  
14         0% 0%, 0% 50%,  
15         from(rgba(176, 188, 205, 1)),  
16         to(rgba(129, 149, 175, 1)));  
17 }  
18 .button {  
19     background-image: -webkit-gradient(linear, top, bottom,  
20         from(#C5CCD4),  
21         to(#fff));  
22     -webkit-background-size: 100% 50%;  
23     background-size: 100% 50%;  
24 }  
25 .cancel {  
26     background-color:#4A6C9B;  
27     background-image: -webkit-gradient(linear, 0 0, 0 100%,  
28         from(#8EA4C1),  
29         to(#5877A2));  
30     -webkit-background-size: 100% 50%;  
31     background-size: 100% 50%;  
32 }  
33 .done {  
34     background-color: #2463DE;  
35     background-image: -webkit-gradient(linear, 0 0, 0 100%,  
36         from(#7B9EEA),  
37         to(#376FE0));  
38 }
```



http://www.westciv.com/tools/gradients/ Reader Google

8 Tutorials ... « WPCrowd Yahoo! GeoCities SurfTheChannel - Home Apple Yahoo! Google Maps YouTube Wikipedia News (3263) Popular

Linear Gradients Linear Gradients

Style Master Tools Linear Gradients Radial Gradients Text Shadow Box Shadow Text Stroke Transforms

Webkit Firefox

Start

Color C5CCD4

h Position 100 %

v Position 100 %

End

Color CBD2D8

h Position 0 %

v Position 100 %

Stops

Color CBD2D8

Position

Color C5CCD4

Position

Delete Stop Add Stop

Preview

<http://www.westciv.com/tools>

The code

```
-webkit-gradient(linear, 100% 100%, 0% 100%, from(#C5CCD4), to(#CBD2D8), color-stop(.7,#CBD2D8),color-stop(.7,#C5CCD4))
```

Notes

Gradients are presently only supported in Safari 4 and Chrome (webkit) and Firefox 3.6. In webkit they can be used anywhere an image can be – for example background-image, list-style-image, border-image or with generated content. In Firefox they can only be used as background images.

Note webkit based browsers and Firefox have very different syntax for gradients.

If you specify a gradient as a background, be sure to also specify a background color, to ensure text is legible in browsers which don't support gradients.

Gradients can be linear or radial (this editor creates linear gradients for webkit browsers). In webkit they require a start and stop position and color, and may also take one or more color stops, which specify a color and position. Enjoy playing with gradients!

Transforms

translate()

```
-webkit-transform: translate(15px, -15px);  
transform: translate(15px, -15px);
```



translateX()

```
-webkit-transform: translatex(15px);  
transform: translatex(15px);
```



translateY()

```
-webkit-transform: translatey(-15px);  
transform: translatey(-15px);
```



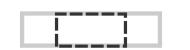
scale()

```
-webkit-transform: scale(1.5, 2);  
transform: scale(1.5, 2);
```



scaleX()

```
-webkit-transform: scalex(0.5);  
transform: scalex(0.5);
```



scaleY()

```
-webkit-transform: scaley(2);  
transform: scaley(2);
```



rotate() -webkit-transform: rotate(15deg);

transform: rotate(15deg)



skew() -webkit-transform: skew(15deg, 4deg);
transform: skew(15deg, 4deg);



skewX() -webkit-transform: skewx(15deg);
transform: skewx(15deg);



skewY() -webkit-transform: skewy(-3deg);
transform: skewy(-3deg);



Multiple transforms

```
.enlargen:hover {  
    -webkit-transform: translate(-50%, -50%) scale(2) rotate(0);  
    transform: translate(-50%, -50%) scale(2) rotate(0);  
}
```



Transitions

```
1 nav a {  
2     background-color: #FFFFFF;  
3     -webkit-transition: background-color 500ms linear 250ms;  
4     -moz-transition: background-color 500ms linear 250ms;  
5     -o-transition: background-color 500ms linear 250ms;  
6     transition: background-color 500ms linear 250ms;  
7 }  
8 nav a:hover {  
9     background-color: #FF0000;  
10}
```

transition-property

transition-duration

transition-timing-function

ease || linear || ease-in-out || ease-in || ease-out || cubic-bezier()

transition-delay



Multiple Transitions

```
1 nav a {  
2     background-color: #FFFFFF;  
3     border: 5px solid #CCCCCC;  
4     -webkit-transition:  
5         background-color 500ms linear 750ms,  
6         border 500ms linear 250ms;  
7     -moz-transition:  
8         background-color 500ms linear 750ms,  
9         border 500ms linear 250ms;  
10    -o-transition:  
11        background-color 500ms linear 750ms,  
12        border 500ms linear 250ms;  
13    transition:  
14        background-color 500ms linear 750ms,  
15        border 500ms linear 250ms;  
16}  
17 nav a {  
18     background-color: #000000;  
19     border: 5px solid #FF0000;  
20 }
```



Animation

```
1 @-webkit-keyframes 'pulsatingText' {
2     from {
3         font-size: .93em;
4     }
5     to {
6         font-size: 2em;
7     }
8 }
9
10 @-webkit-keyframes 'rainbow' {
11     0% {
12         background-color: red;
13     }
14     20% {
15         background-color: orange;
16     }
17     40% {
18         background-color: yellow;
19     }
20     60% {
21         background-color: green;
22     }
23     80% {
24         background-color: blue;
25     }
26     100% {
27         background-color: purple;
28     }
29 }
```



Mobile Web - Frameworks



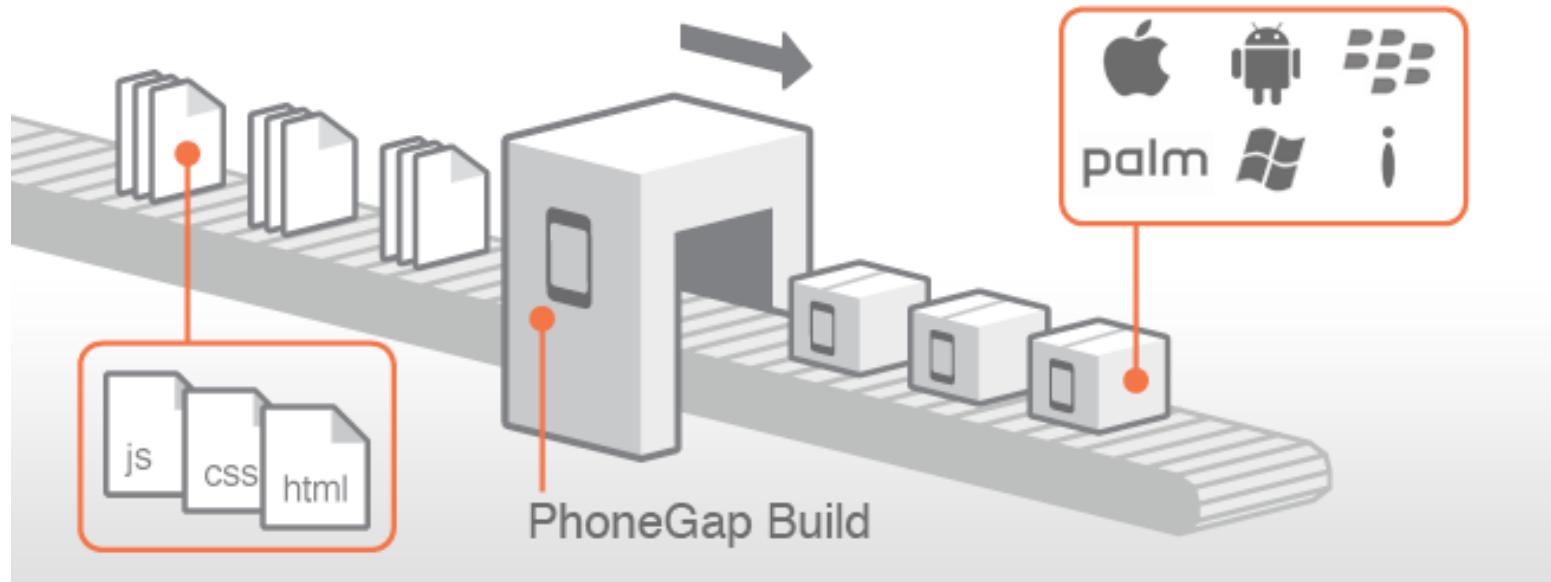
What is PhoneGap?

- A framework for developing cross-platform applications for smartphones using web standards (HTML, JavaScript, CSS).
- Developed by Nitobi and is an open-source framework under the MIT license.
- Developed to improve the development of cross-platform applications.
- Currently PhoneGap supports the following platforms:
 - iOS
 - Android
 - Palm
 - Symbian
 - RIM



How does it works?

- PhoneGap wraps the Web View of the phone with a container.
- This container will allow the application to access native features of the phone that might not be available in the Web View.



Features

- PhoneGap allows you to access native features of the phone like:
 - Accelerometer
 - Geolocation
 - Notification
 - Camera
 - Contacts
 - Network state
 - And more...



Advantages vs. disadvantages

- Build once run everywhere
- Using existing, proven standards.
- Turns your web app native.
- Easy to use JavaScript-libraries in the applications.
- Allows web developers to become mobile application developers.
- Documentation not perfect.
- Even though it supports many platforms, it does not support the same functionality on all of the platforms.
- Not suitable for applications with high-demand on graphics.
- No native UI.



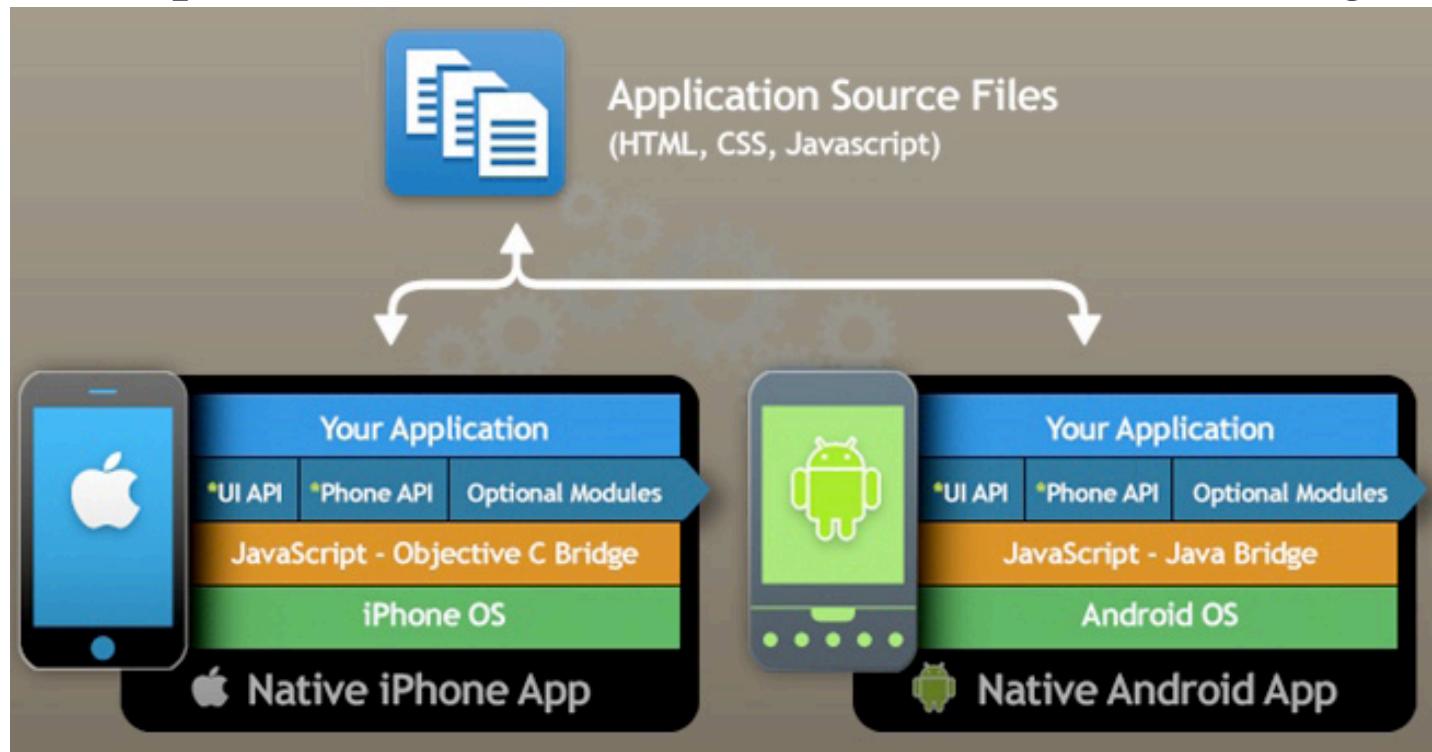
What is Appcelerator - Titanium?

- Development of hybrid iOS and Android applications by using Web development technologies
- Hybrid apps run native on the device - not in the browser
- Framework can access native features and data
- (Sensors, Camera, Contacts)
- Implementation and integration of native modules
- (Objective-C, Java) possible



How does it work?

- Titanium JavaScript-Code is compiled almost one to one to respective native functionalities -> native binding



Appcelerator vs. Phonegap

- UI und functionalities are native (No WebContainer)
- Interpreter running for dynamic code
- Standard Mobile Web Applications
- Runs in a WebView container within an native App
- Access of native features possible by using JS functions



Example

```
n1.add(label1);

Create a button
var button = Titanium.UI.createButton({
    title: 'Hello',
    width: 150,
    height: 40,
    bottom: 50
};

Add Eventlistener to button
button.addEventListener('click',function(e)

    Titanium.API.info("You clicked the button")
    label1.text = "Hello Titanium";
});

Add buttton to Window
n1.add(button);
```



The results in emulators



Mobile Web – The Future



Main application domains for the future

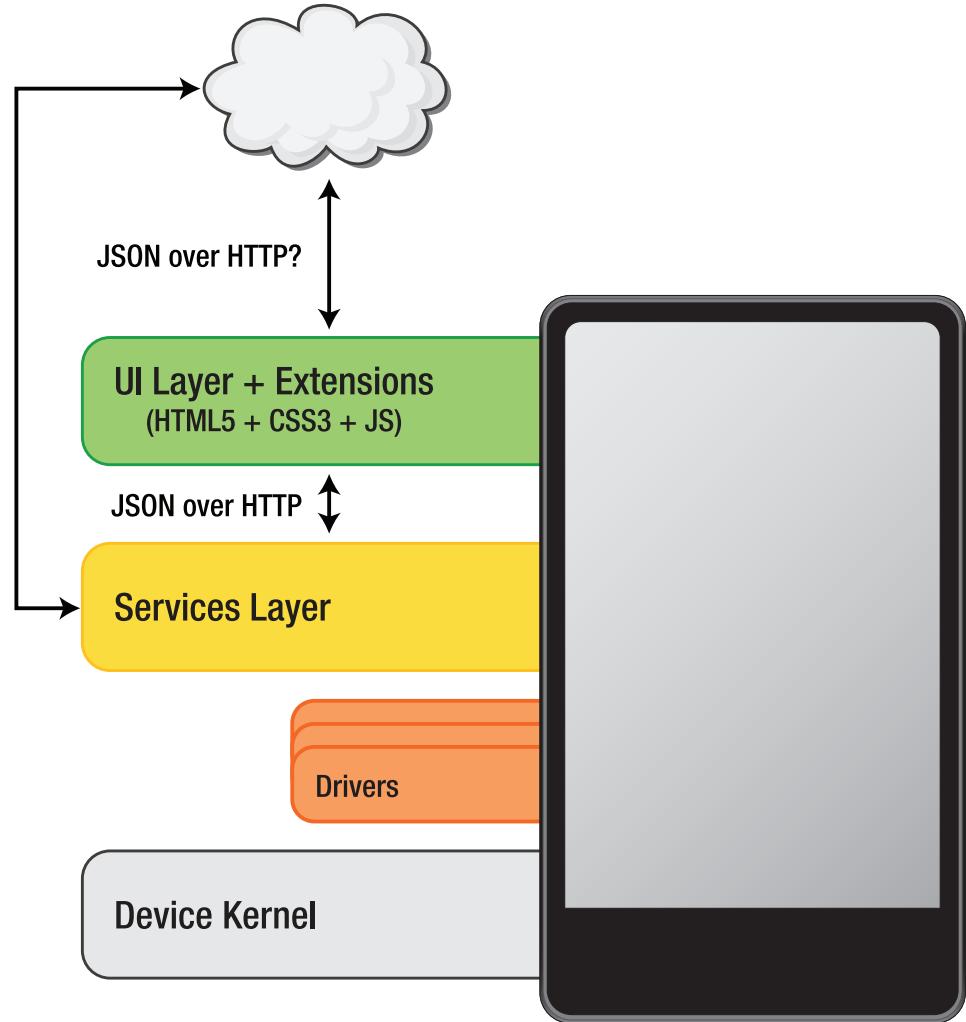
(Gartner, 2011)

1. Location based services
2. Social Networking
3. Context Aware services
4. Object recognition
5. Mobile search
6. Mobile payment
7. Mobile instant messaging
8. Mobile Video
9. Mobile email
10. Mobile commerce



The future

- Internet of things
- Web centric architectures – toward a mobile cloud
- Web technologies and frameworks
- “Build once” approach



Oehlman and Balnc , 2011



The challenges

- Operating systems choices and legacy support
- User centered design and engagement approaches
- Development tools and frameworks
- Overall technological architecture
- A revenue model



Questions and comments!



Downloads

1. Android

- <http://developer.android.com/sdk/index.html>
- <http://www.eclipse.org/downloads/>

2. iOS

- <http://developer.apple.com/devcenter/ios/index.action>

3. Qt

- <http://qt.nokia.com/downloads/>

4. Phonegap

- <http://www.phonegap.com/download/>

5. Titanium

- <http://www.appcelerator.com/products/download/>



References

- Maximiliano Firtman (2010) “*Programming the Mobile Web*”, O'Reilly Media

