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Developing Mobile Applications for i using Open Source Tools

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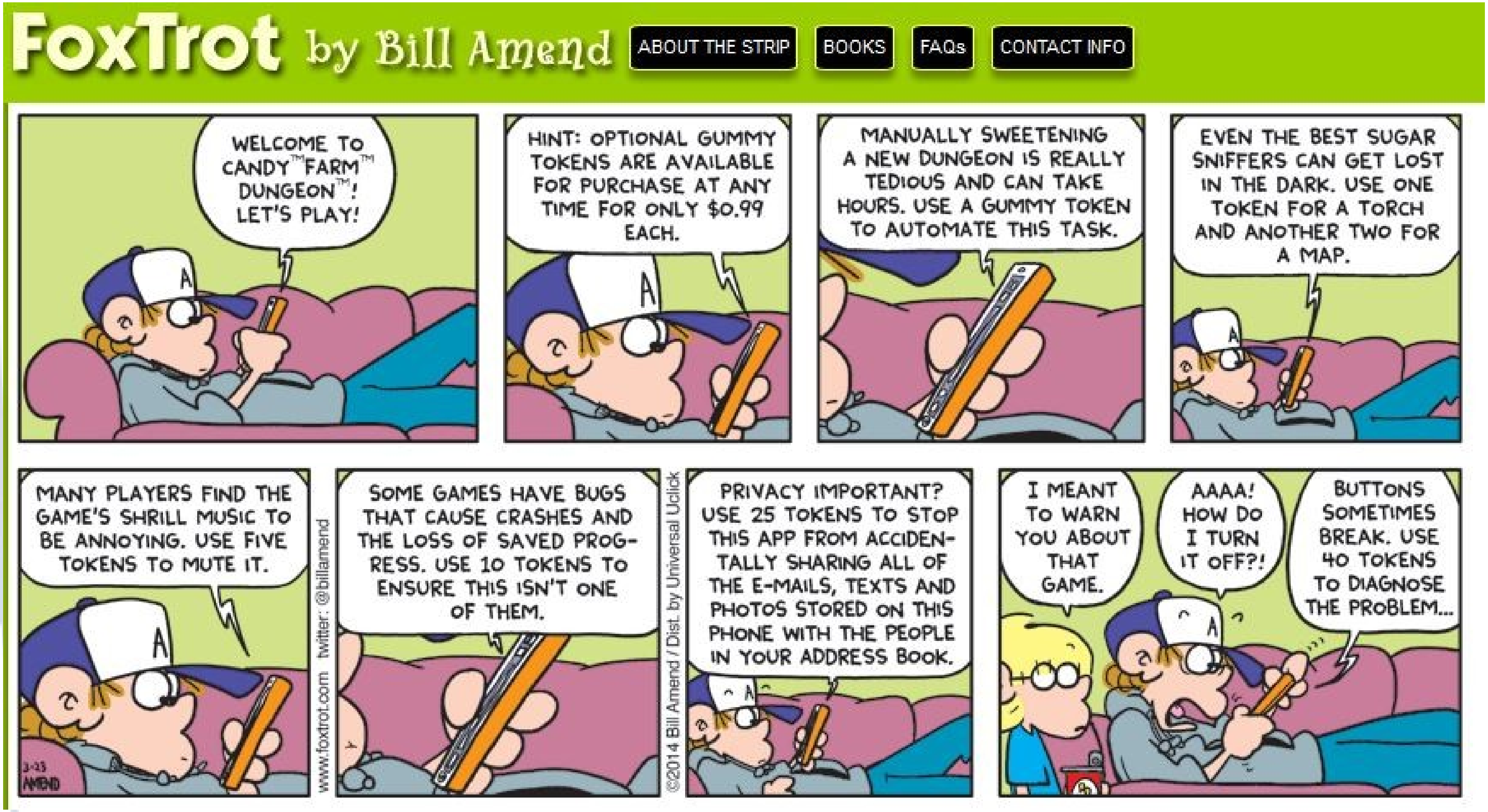
What will you get from this session?

- You will know the differences between a web application, a **mobile** web application and a native mobile application.
- How to change your web applications to mobile web applications.
- How to (easily) take a mobile web application and create a “native” mobile application

Agenda

- Won't be:
  - Writing a native Android app (too much Java!)
  - Writing a native IOS app (too much Objective C)

Mobile apps in 2014


FoxTrot by Bill Amend
ABOUT THE STRIP
BOOKS
FAQs
CONTACT INFO
WELCOME TO CANDY™FARM™ DUNGEON™! LET'S PLAY!
HINT: OPTIONAL GUMMY TOKENS ARE AVAILABLE FOR PURCHASE AT ANY TIME FOR ONLY $0.99 EACH.
MANUALLY SWEETENING A NEW DUNGEON IS REALLY TEDIOUS AND CAN TAKE HOURS. USE A GUMMY TOKEN TO AUTOMATE THIS TASK.
EVEN THE BEST SUGAR SNIFFERS CAN GET LOST IN THE DARK. USE ONE TOKEN FOR A TORCH AND ANOTHER TWO FOR A MAP.
MANY PLAYERS FIND THE GAME'S SHRILL MUSIC TO BE ANNOYING. USE FIVE TOKENS TO MUTE IT.
3-23 AMEND
www.foxtrot.com twitter: @billamend
SOME GAMES HAVE BUGS THAT CAUSE CRASHES AND THE LOSS OF SAVED PROGRESS. USE 10 TOKENS TO ENSURE THIS ISN'T ONE OF THEM.
©2014 Bill Amend / Dist. by Universal Uclick
PRIVACY IMPORTANT? USE 25 TOKENS TO STOP THIS APP FROM ACCIDENTALLY SHARING ALL OF THE E-MAILS, TEXTS AND PHOTOS STORED ON THIS PHONE WITH THE PEOPLE IN YOUR ADDRESS BOOK.
I MEANT TO WARN YOU ABOUT THAT GAME.
AAAA! HOW DO I TURN IT OFF?!
BUTTONS SOMETIMES BREAK. USE 40 TOKENS TO DIAGNOSE THE PROBLEM...

To rip off an well known book from the 60's:

Zen and the Art of Developing Mobile Applications using Open Source Tools

Inroduction

- Mobile is all about the client (so where does i fit in?)
- Rethinking Web Development
  - Ajax
  - HTML and HTML5
  - Page, page construction and paging.
  - JSON
  - M is for minimalist
- Examples of “classic” web design

Introduction

- Deconstructing “classic” design
- Reassembly as HTML5 and “Web 2.0” techniques
- Tweaking HTML5 for Mobile applications e.g. Building a mobile web application

Introduction

- Mobile application development framework review
- Developing an Native application
  - Natively
    - Learn Java, Objective C
  - Use PhoneGap/Cordova
  - Use a Bridge app like bridgeit.mobi
- Review some examples including a Common Schedule Organizer web application!

Mobile is about the client

Web Apps

Native Apps

i?

Mobile means rethinking web development

Two basic principles:

Don't waste users bandwidth on something they don't need

Be a good citizen – Conservation is good.

Wasting bandwidth

Images
RSS feeds
Tracking Plugins
Whole js libraries

Conserve

Hang on to data with explicit caching (localstorage)

Refresh only when needed.

We are back at the good old days (mid 1990's):
Paying per kb and slow connections

Rethinking Web Development

AJAX

(Asynchronous Javascript And XML)

Nothing new here(1999)...move along

Introduced by Microsoft in IE 5 (XMLHTTP)

The much maligned IE 6 further extended capabilities

Thanks to the browser wars....

Rethinking Web Development

HTML5 – New?

Been around since 2004

Big hitter improvements:

New markup: <nav> <footer><video> <audio> and others.

New features: validation, client side storage.

Rethinking Web Development

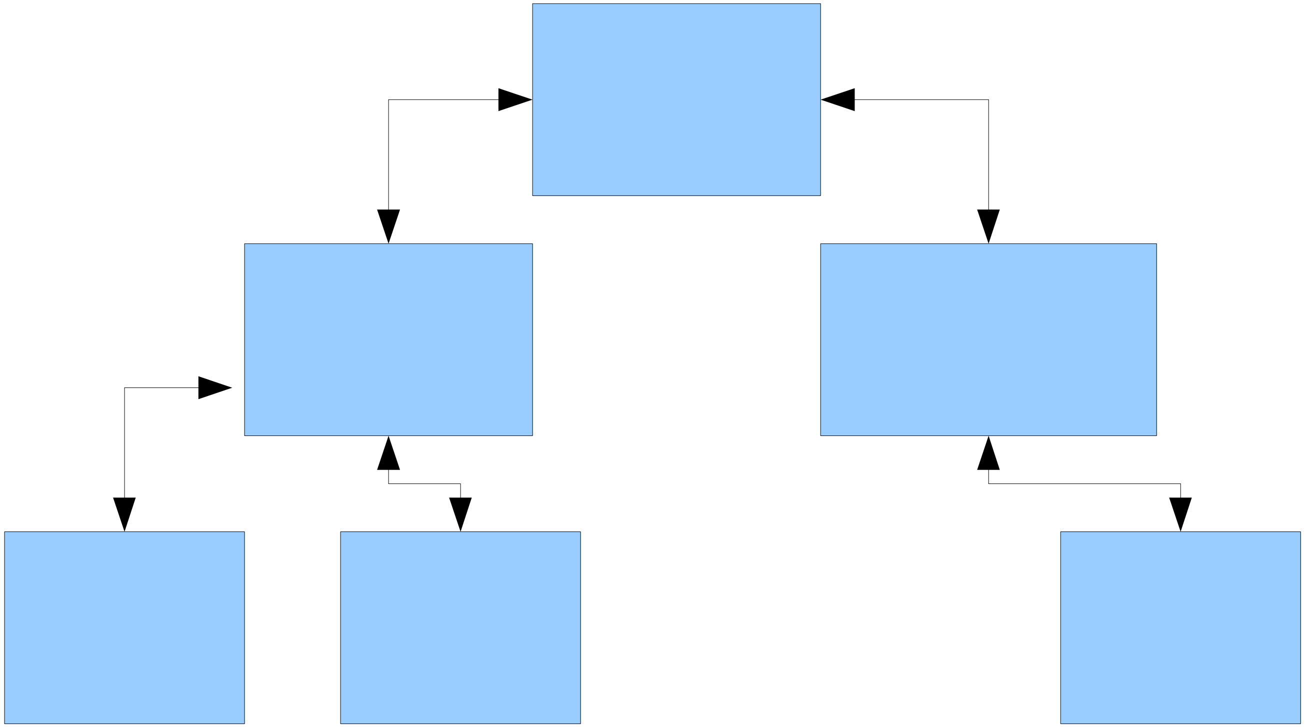
- Classic design:
  - Display page in the browser
  - User completes page, submits to server
  - Server validates data:
    - Returns errors to user

      OR
    - Displays the next page

- Rinse, lather, repeat....

Rethinking Web Development

Pages and paging



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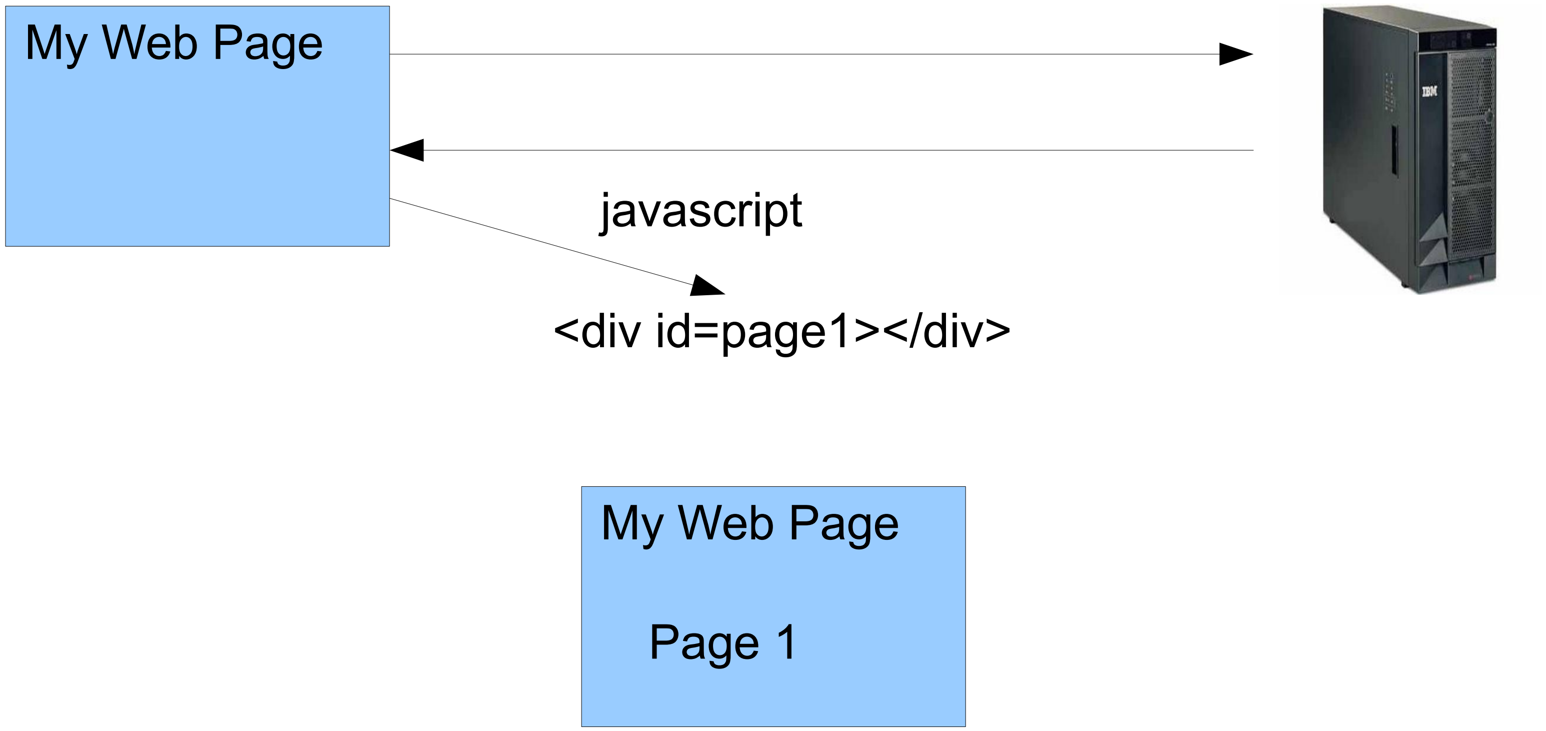
Rethinking Web Development

JSON

(Javascript Object Notation)

Lightweight – simple to transport (AJAX)
Javascript already knows what to do with it
(it's an Object!)

Pagination the AJAX way



M is for minimal

Deconstructing “classic” web design

Take a look at this web site (ugly)

Http://opensourceoni.com/baseDemo/Demo

Simple app, two pages, gets messages from IBM i

Deconstructing “classic” web design

Another simple example that checks on whether a port is open or not.

Hosted on i. Java App. Calls IBM i API's

http://opensourceoni.com/baseChkPort/Demo

Reassembly as HTML5 and "Web 2.0" techniques

http://opensourceoni.com/mobile/cgi_adhstm.pgm

Demo – Walk through

- RPG – 5250
- CGIDEV2 – Ugly web based
- CGIDEV2 – Pretty web based
- CGIDEV2 – Pretty, web based, using local storage (more mobile-ish...)
- PHP – Ugly
- PHP – Pretty
- PHP – Pretty using local storage

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Web Server Info

- Apache is the front end to all of these web applications (HTTP Server)
- You need to add Apache directives to map URL's to the CGIDEV2 programs.
- Lets take a look

So you still want to build a native mobile app?

Choose a framework.

Many are based on Eclipse which is a comfortable transition for the RDp, EGL and Zend Studio folks.

Standard Apache Directives

```
# Configuration originally created by Create HTTP Server wizard on Mon Jul
25 12:31:00 MDT 2011
LoadModule zend_enabler_module
/QSYS.LIB/QHTTPSVR.LIB/QZFAST.SRVPGM
```

ScriptAliasMatch

Map URL's to CGIDEV2 Programs

```
ScriptAliasMatch /mobile/(.*)  /qsys.lib/mobile.lib/$1
Alias /mobilejs   /www/mobileapps/htdocs/mobile/js

# MobileREM directives
ScriptAliasMatch /mobilerem/(.*)  /qsys.lib/mobilerem.lib/$1
Alias /mobileremjs   /www/mobileapps/htdocs/mobilerem/js
Alias /mobileremcss   /www/mobileapps/htdocs/mobilerem/css
```

Permissions

```
<Directory /qsys.lib/mobilerem.lib>
     order allow,deny
     allow from all
     Options -ExecCGI
     CGIConvMode %%EBCDIC/EBCDIC%%
  </Directory>

  <Directory /www/mobileapps/htdocs/phpdemo>
     Options None
     order allow,deny
     allow from all
  </Directory>

  <Directory /qsys.lib/mobile.lib>
     order allow,deny
     allow from all
     Options -ExecCGI
     CGIConvMode %%EBCDIC/EBCDIC%%
  </Directory>
```

Now lets jump into Code

- RPG
- PHP
- Java (if you want)

Possible Frameworks

- Xcode – iPhone development
- Visual Studio – Windows Mobile
- Eclipse based
  - PhoneGap
  - Titanium
  - Rhomobile
  - Blackberry Eclipse plugin
  - Android SDK – Eclipse Plugin
  - WebOS (Palm) Eclipse Plugin

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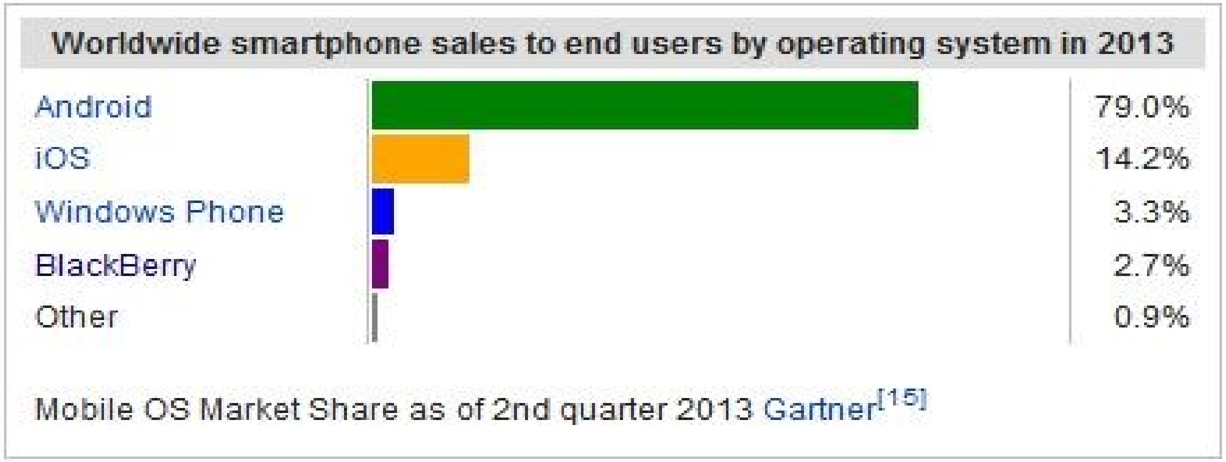
Possible Frameworks

Most popular target devices:

iPhone
Android
Blackberry

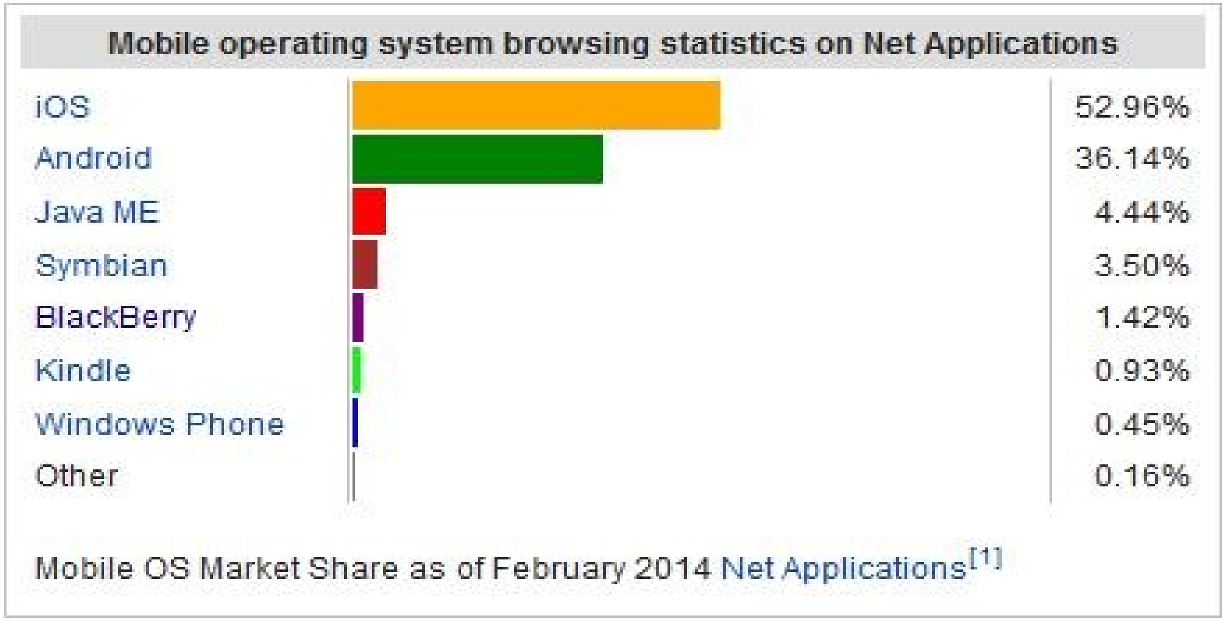
I am using PhoneGap (aka Apache Cordova) for mobile apps that require multi-platform deployment.
Write javascript, deploy to:
Android
Blackberry
iPhone
(requires Mac to compile Objective C code)

Mobile Frameworks



Worldwide smartphone sales to end users by operating system in 2013	
Android	79.0%
iOS	14.2%
Windows Phone	3.3%
BlackBerry	2.7%
Other	0.9%

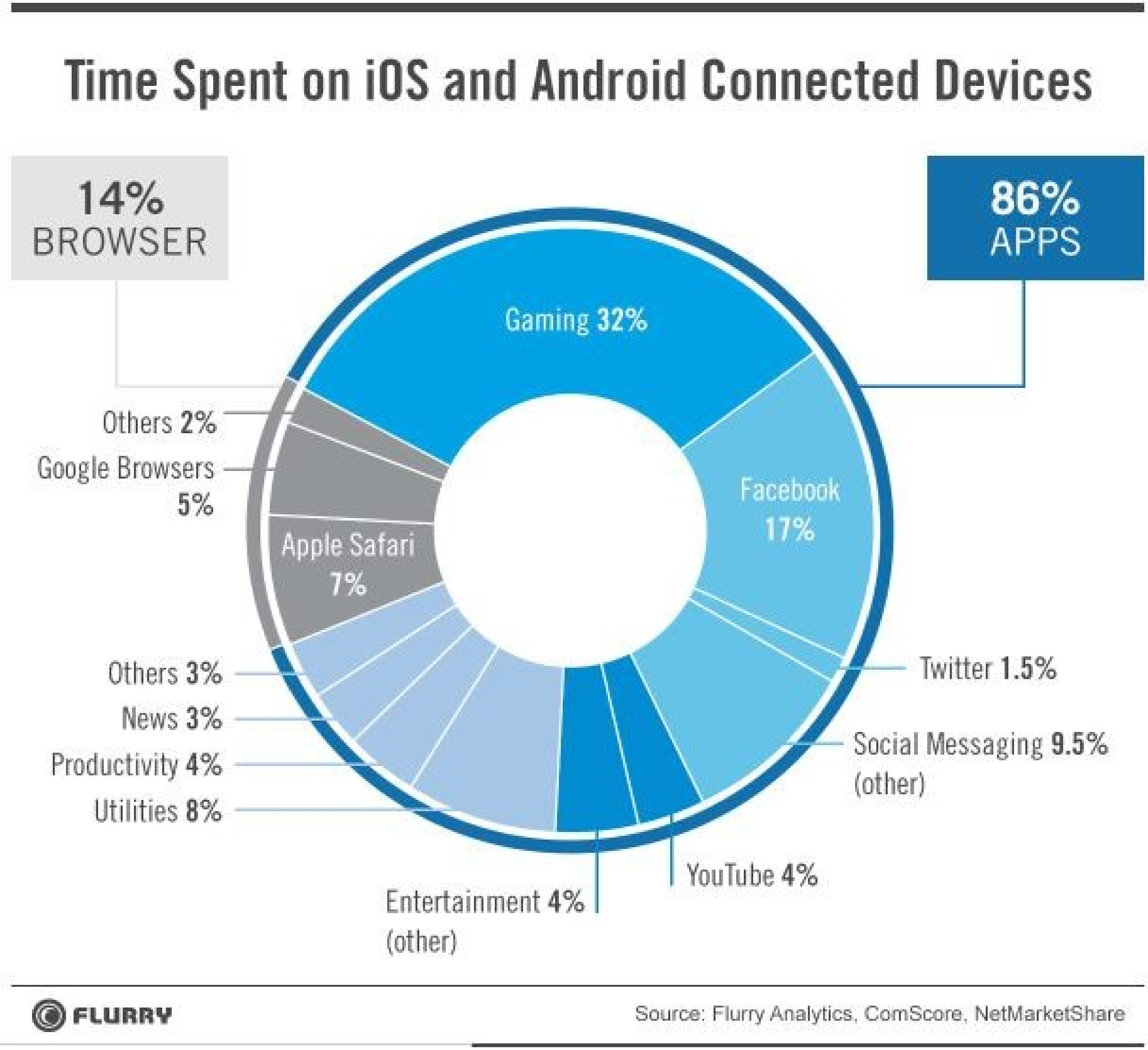
Mobile OS Market Share as of 2nd quarter 2013 Gartner[15]



Mobile operating system browsing statistics on Net Applications	
iOS	52.96%
Android	36.14%
Java ME	4.44%
Symbian	3.50%
BlackBerry	1.42%
Kindle	0.93%
Windows Phone	0.45%
Other	0.16%

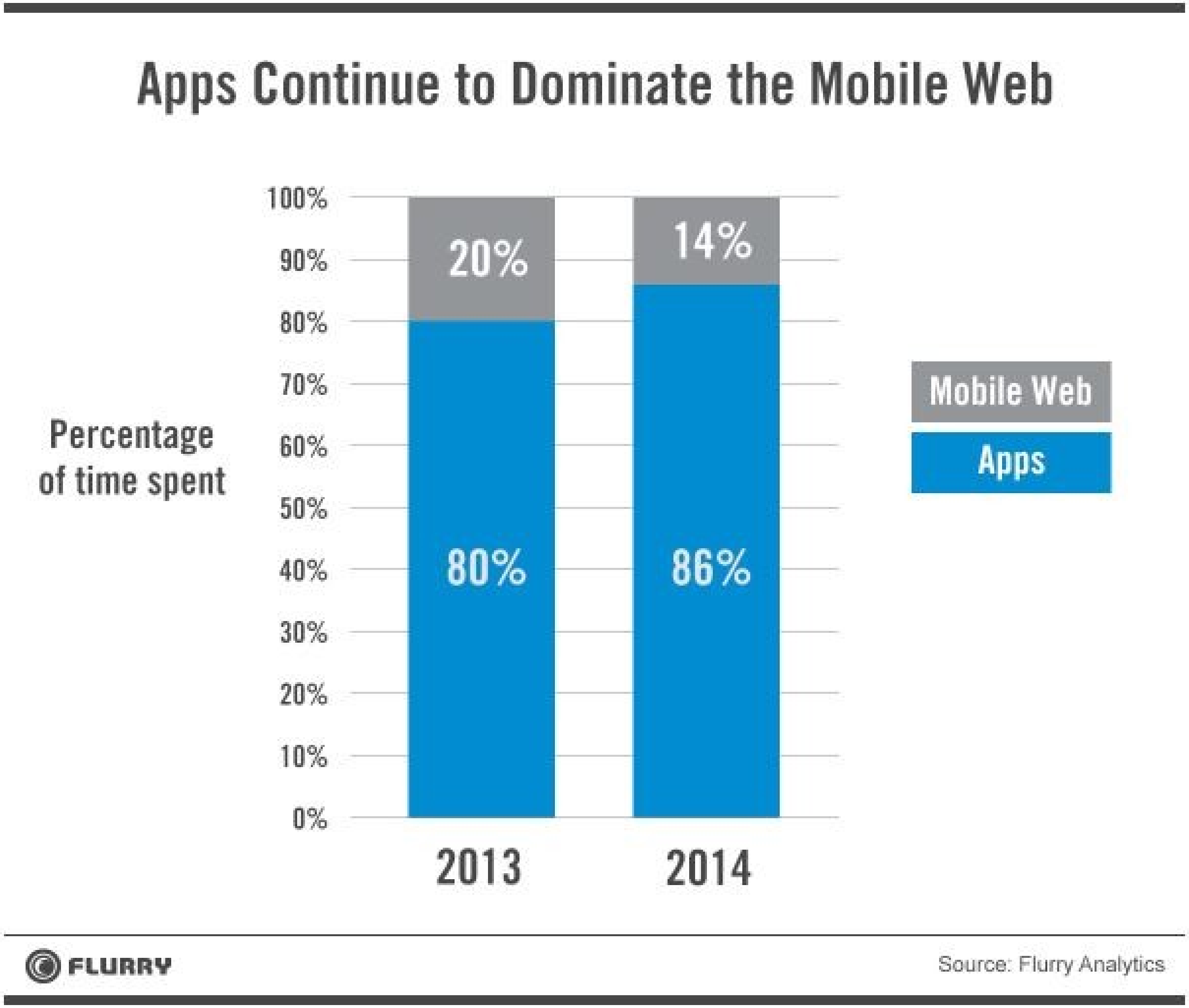
Mobile OS Market Share as of February 2014 Net Applications[1]

Mobile Frameworks



Source: Flurry Analytics, ComScore, NetMarketShare

Mobile Frameworks



Mobile Frameworks

- Webapps are a lower percentage but I would say that business webapps are a higher percentage than business mobile native apps
- The progression we saw in fat client apps (essentially what native apps are today) has been away from the desktop an on to the web. Apps like bridgeit.mobi are likely to displace native apps as that functionality is added to mobile browsers.

Build a “native” Android App

Aaron Bartell also has some resources:

http://www.mowyourlawn.com

http://www.SureYouCanHaveTheKeys.com

http://www.systeminetwork.com

(Aaron focuses on Android Native only, so you'll need a little Java background)

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Build a “native” Android App

GREAT tutorial on native Android Development:

http://www.smashingmagazine.com/2010/10/25/get-started-developing-for-android-with-eclipse/

Two part series and absolutely excellent

(can also Google search for Android and BrewClock to find the articles)

Building “native” android application

Plenty of resources on the web to get you started with Android.

Good resources at http://developer.android.com

Building a PhoneGap application for Android

PhoneGap is primarily a framework for running javascript enabled web pages as “native” applications.

The anatomy of the PhoneGap application

Create the page using any HTML5 compliant editor and run it in a fully HTML5 compliant browser, like Chrome.

Bring it in as a resource to PhoneGap.

Wire it up to Android or iPhone API's using JavaScript.

The Anatomy of a PhoneGap application.

Let's take a look.

Bridgeit.mobi

- Like PhoneGap provides a “bridge” between HTML5/CSS3/JS web pages and the native OS.
- Again, this is where I think mobile browsers will go, eliminating the need for “native” apps (you heard it here first!)

Review

- Mobile development is about the client
- Mobile development uses:
  - HTML5 (could use HTML4- not recommended)
  - AJAX
  - Lightweight data transport
    - JSON
    - XML
    - YAML
- Native app development uses the same components but resides on the device (client-server)

The Common Schedule Organizer

Web version found here:
http://opensourceoni.com/schedule/GetWeb?action=HTML5

Can be accessed from any HTML5 capable browser. The localstorage option requires webkit based browser

Thanks!

Blog update soon with a step by step:

http://www.petesworkshop.com/blog_wp/

Contact me at: pete@valadd.com

(put “Common” somewhere in the subject line)

www.petesworkshop.com/downloads/MobileAppDemo.zip