# Development for the iPhone/iPad from a Java Perspective

The Tools, The Language, The Experience

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# Myself

- Software Architect; @Netcetera since 2001
- > 2000 present: Java (enterprise, web, swing, RCP)

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- > 2008 present
  - Mobile Development: Android, iPhone OS
  - Technical Lead for Wemlin





# What are the key factors that influence the development for these platforms?



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#### Hardware





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#### Devices

- > iPhone
- > iPhone 3G
- > iPod Touch
- > iPod Touch 2nd generation
- Phone 3GS

- > ARM11 ~ 400 MHz
- > 128MB RAM (~50MB available to an app)
- > Hardware Graphics Accelerator
- > Slightly faster
- > ARM Cortex V8 ~ 600 MHz
- > 256MB RAM

> iPad

- > Apple A4 SoC (ARM) ~ 1GHz
- > 256MB RAM



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# Physical Form

- > iPhone
  - 480 x 320 @ 163ppi
  - 3.5in
  - 135g

> iPad

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- 1024 x 768 @ 132ppi
- 9.7in
- 730g

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#### Mode of Use





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#### The Walled Garden





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# Developer License Agreement

- > Fluctuates
- > Lately forbade
  - usage of central "usage statistics" agencies
  - location based advertisement
  - use of cross-platform tools
  - background apps (at the moment)
  - central
- > Risk of rejection greatly influences ambitions
- > Risk of further changes affects even more decisions

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#### **Review Process**

#### > Ensures

- conformity with the license agreement
- > End users trust the store
  - no malicious software
- > Our experience so far: predictable



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# **Distribution Options**

- > Free/Paid app in the appstore
- > AdHoc
  - good for beta testing
  - good for distribution within smaller companies

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- > Enterprise Distribution
  - difficult go get
  - 500+ employes
  - credit rating

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# Available on the iPhone App Store

- Increasingly seen as a marketing vehicle
- Marketing priority is often higher than providing actual value to end users
- It doesn't work!
  - bad reviews by unsatisfied customers
  - brand damage

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# Key factors that affect the development for these platforms

> Hardware

- > Form Factor / Screen Side
- > Mode of Use
- > The Walled Garden
  - License Agreement
  - The Distribution Models
- > The Hype

#### > The Distribution Models JAZOON HE INTERNATIONAL CONFERENCE ON JAVA TECHNOLOGY 3 JUNE 2010, ZURICH

#### As a result



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# Design

- \* "We worked on iPad projects without ever having touched an iPad."
- One client asked us to "start working on that tablet thing" even before we knew whether the iPad was real. "
- Are we designing desktop programs, web sites or something entirely new?"
- > "...we had no other choice than printing out your screens on a 1:1 scale. "

http://informationarchitects.jp/designing-for-ipad-reality-check/

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#### Example

0	Google Reader (1000+)						
• 8	iPad						
Gm	DARING FIREBALL					Help   Sign out	
G	Steve Jobs Live From the D8 Conference	Kaleidoscope 1.0	Deconstruction of the Wired iPad App	Adobe Digital Viewer for Magazines	[Sponsor] 1Password and Knox	Speakin Whom A Does No	
Peo 1 Exp Sul	Interviewed by Walt Mossberg and Kara Swisher. Josh Topolsky has live coverage at Engadget, too. Update: Video 	New file comparison tool from Sofa; shows differences not just between text files but also images. Worth a look; it's very	Speaking of the Wired iPad app, Layton Duncan has a good analysis of how it's built: At its core the app is a simple XML	Adobe Adobe Systems Incorporated has unveiled a new digital viewer technology that enables print publishers to	Agile Web Solutions is celebrating this week's Daring Fireball sponsorship with an unbelievable sale. This week only, save 50%	Rob Endwireframing Omni Is it poss bungling <u>Phone to</u> Microsoft	
8	NYT > HOME PAGE					ublishers	
	Turkish Funds Helped Group Test Blockade of Gaza 	After Raid, Videos Carry On the Fight	Prime Minister of Japan Tells Nation He Plans to Quit	Ball Boys and Ball Girls Wake Up French Open	Alzheimer's Stalks an Extended Family in Colombia	Steven F Effort to Wall St. or Too	
8	When the Free Gaza Movement teamed up with a much wealthier Turkish organization to assemble a flotilla, it was supercharged	What is missing so far from flotilla clips on both sides is context: it is difficult to say who attacked first.	Word of Yukio Hatoyama's planned resignation came after his approval ratings dipped when he reneged on a promise about a U.S	Les ramasseurs de balles, the gatherers of the balls, put on a show before the main event at Roland Garros.	One family is at the center of potentially groundbreaking research to see if treatment before dementia can stop Alzheimer's	In: Stores Steven L. resisted <u>Dne 2009</u> effort to I <sup>D</sup> osse working c investigat <u>s users</u> eInsider to switch Unsider	
Mar	ARS TECHNICA Publishers want universal e-books; won't cooperate to get them	The RIAA? Amateurs. Here's how you sue 14,000+ P2P users	Big   Spyware trojan hitching   ride on third-party Mac   screensavers	Worldwide browser market share: May 201 Percent	Small-scale biodiversity needs randomness and productivity	Intel fas superco from as	

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#### Characteristics

- > End-user oriented apps (products)
- Information consumption oriented
- > Better (native) interface to web sites and services
- > Minimum Input Maximum Output
- > Games
- Search hasn't happened on mobile devices" -- Steve Jobs

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# iPhone Apps

- > Make good use of "connected everywhere anytime"
- Identify the situations and provide the right data or service

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- > E.g.
  - Paperless tickets
  - Mobile Payments



#### iPad Apps

- > Sits between iPhone and a PC
  - not as mobile as iPhone
  - not as powerful as PC
- Compel users to bring the iPad instead of the laptop out
  - identify conveniences
  - out do certain apps utilizing them
- Compared to iPad: make use of bigger screen

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- > Web / Desktop
  - hardware / situation is irrelevant

- > Mobile application
  - tries hard to identify the situation the user is in
  - performance, hardware is crucial





## Diving Deeper: The Platform



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## Toolbox (sanctified)









xCode

Interface Builder

**iPhone Simulator** 

Instruments



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## Objective-C

- > Dynamically Typed, late bound
- > Super-set of C
- > Semantically very similar to Java
  - root class
  - single inheritance
- Smalltalk-like syntax for message passing
- > Protocols are just like interfaces
  - have optional methods
- Classes can be extended through categories

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- > Classes cannot be nested
- > Verbose

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# Memory Management

- > Manual Reference Counting
- > Autorelease pools

anObject = [argumentObject retain]

[anObject release]

return [anObject autorelease]

> THE biggest issue we had and still have

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dangling pointers

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#### The Stack

- > OS X (Darwin, Mach 3)
- > libc (POSIX)
- > Core Services
- > CocoaTouch



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#### Minimal Application



#### Delegate Pattern



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# UIKit

- > The toolkit for doing UI
  - views, controls
  - event handling
  - etc...
- > Is also an application framework



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# The MVC you know



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#### The Classic MVC



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- views composed out of stock components in interface builder
- > behavior in controllers
- > connections in interface builder (outlets, actions)

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# UlKit: Common components

- > UIWindow
- > UIView
- > UITabBar
- > UINavigationController
- > UITableView
- > UITableViewCell
- > UIButton

- > UIWebView
- > UITextView
- > UIActivityIndicatorView
- > UIPageControl
- > UISearchBar

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> Text, slider, progress, etc...

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# **Event Handling**



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- > motion events also (accelerometer based)
- > responder chain

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# Gesture Recognizers (iPad)

- > Helpers for views
- > Built in: pinch, zoom, tap, etc...
- > Custom built



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# Actions, Notifications, KVC

- > Events have narrow meaning -> user interaction
- Converted into actions by views (controls)
- > Actions
- Key-Value Observing <~> Property Observation
  - much more elaborate though
  - comes out of the box for declared properties
- Notifications: broadcasting messages to more than one party

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# CoreAnimation

- > Core Animation Layer
  - hardware accelerated
- > a number of properties can be animated
  - size, position, color, etc,...
  - current affine transformation

- > Animations are transactional and sequence-able
  - transactional: happen at once
  - sequence-able: happen one after the other

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> Very easy to use

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#### CoreData

- > Object Graph Storage
- Comparable to O-R mappers, but
  - multiple storage destinations (sqlite3, memory xml)

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- private schema
- > Dynamic classes
- > Query Language



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#### Web Services

- > ObjectiveResource
  - http://iphoneonrails.com/
- > wsdl2objc
  - http://code.google.com/p/wsdl2objc/

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#### Feeds

- > A particularly good format and paradigm
  - check with server
  - have local copy
  - update local copy with newly discovered items

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- app is useful also offline





- > iPhone App
- Covers
  - > The Zürich greater area
  - > Liechtenstein
- > See departure times for public transport
- > Doesn't need a network connection

- http://mobile.netcetera.ch/wemlin
- http://itunes.com/apps/wemlin

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	Show nearby stations		*
S10	Uetliberg Uetliberg	20:05	>
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S5	Niederweningen Niederweningen	20:07	>
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