

# Using Mobile Technologies in the Brave New World of Computing

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# Quotes from Enterprise Developers

- As long as it is tablet (and not the phone), we should be able to just run existing applications via browser or Citrix, etc.
- We can do it incrementally, one function at a time using native tools
- Native platforms are not matched by cross platform tools
- We can not afford developing for 4 platforms / there are no tools
- and my favorite: Our users are accustomed to our web/desktop applications



# Pervasive Computing

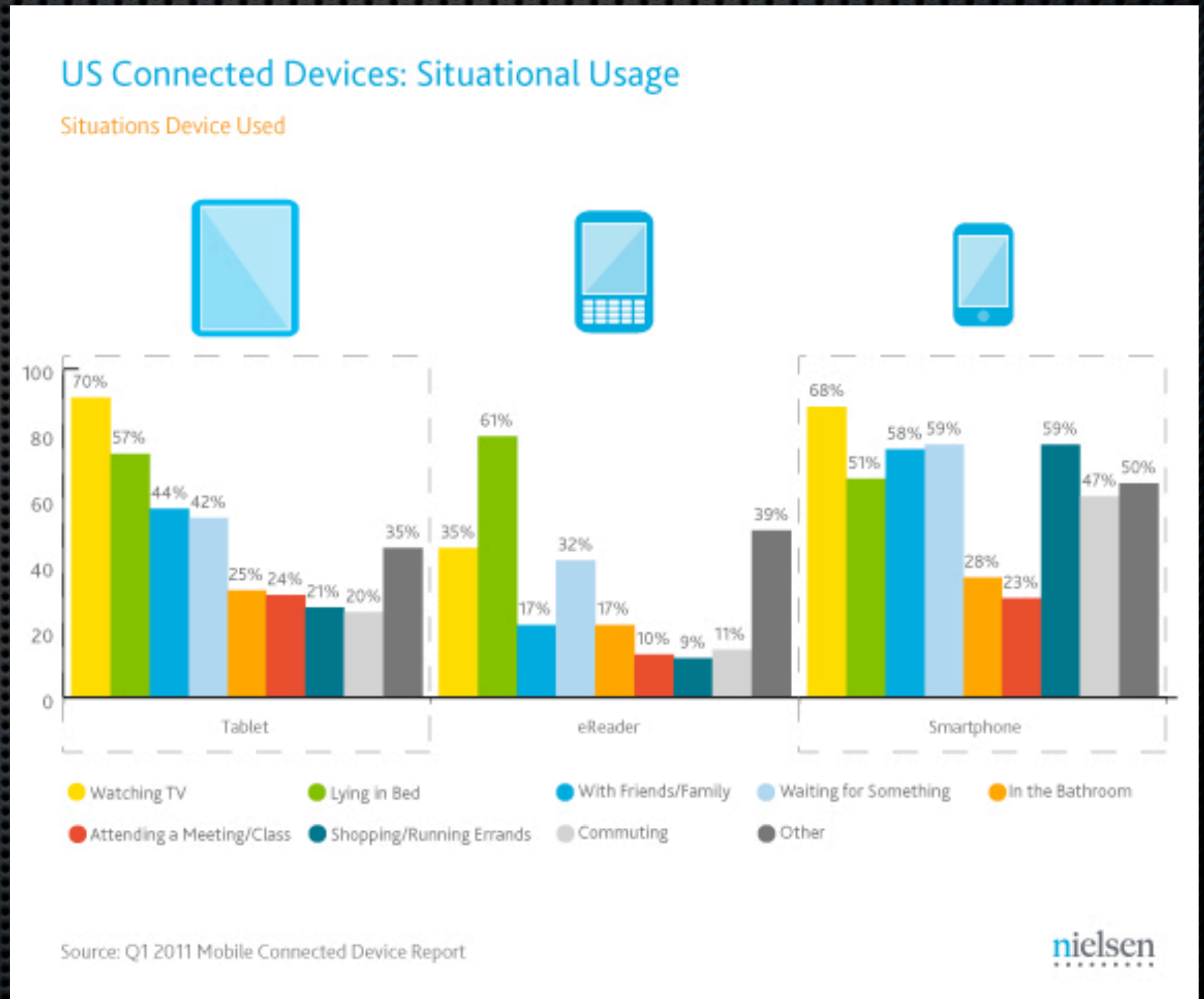
- post-desktop model of human-computer interaction in which information processing has been thoroughly integrated into everyday objects and activities. In the course of ordinary activities, someone "using" ubiquitous computing engages many computational devices and systems simultaneously, and may not necessarily even be aware that they are doing so.





# Using Mobile Platform while doing something else...

- Natural companion device for TV, Meetings
- Not shown, but ideal for phone, conference and scheduling
- Universal remote
- We will discuss creating personal cloud





# Consumer Devices


## openscreenproject.org

New generation of TVs

Pre-installed AIR 2.5 or better. Deployment over-the-air or via USB

Pre-installed on GoogleTV

Cross Platform compatibility, certified on Intel and ARM chipsets



The image shows a Samsung SMART TV screen displaying a variety of web-connected applications. The apps are represented by colorful, 3D-style icons floating in front of the TV. The text "Samsung SMART TV" is prominently displayed on the screen. To the right of the TV, there is a heading "Web-connected apps for your TV" and a paragraph describing the feature: "Get the best of the web right on your TV screen. Choose from a gallery of apps built for your TV that let you stream video, play games, view pictures and more."

Below the TV screen, there is a "Filter by" section with several categories: Videos, Sports, Games, Lifestyle, Information, and Education. A "See All" button is located to the right of these filters.

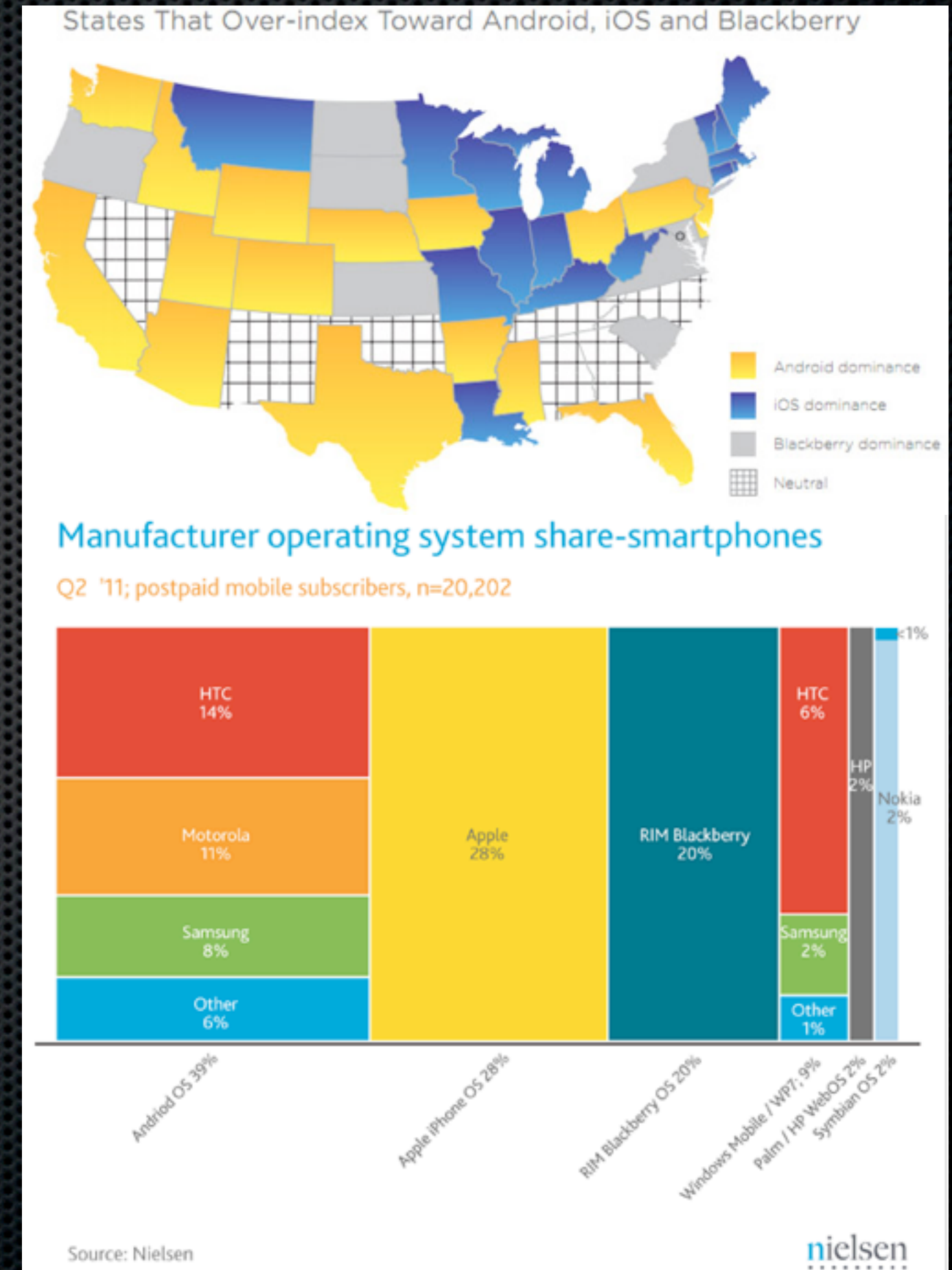
Underneath the filters, the section "Most Popular" displays four featured apps:

- Pandora Lifestyle**: A music app with a "FREE" label and a "More Info" button.
- CinemaNow Videos**: A video app with a "FREE" label and a "More Info" button.
- MiniGame Pack**: A games app with a "FREE" label and a "More Info" button.
- Catch It - Trial Games**: A game app with a "FREE" label and a "More Info" button.



# Android vs iOS in 2011

- No single platform for the next few years
- Support for both iOS and Android a must, BlackBerry will run Android apps to some extent.
- Windows, OSX and browsers need to be supported





# Convergence of the Platforms( Mobile, Consumer and Desktops)

- Android 4 (Q4'11) will reunite tablet and phone version
- iOS development and OSX frameworks are converging ('12)
- RIM phones running QNX expected Q1'12
- Windows 8 ('12) is touch-based scalable platform, also ported to ARM

Your applications will not be able to keep current UI for long



# Reasons to use AIR on mobile

- Reuse existing skills
- Reuse existing screens and components - mostly on the server side
- Portability of the code
- Access to other Adobe technologies, including upcoming cloud services



# Reality check on “Reasons to use AIR on mobile”

- Reuse existing skills - at best 30% of your Flex skill set will be reused, more likely you will find that mobile applications change the way you develop conventional code
- Reuse existing screens and components - better not go there, mobile means complete redesign of the front-end
- Portability of the code - YES, with reasonable (2-3 man month per project) cost.
- Access to other Adobe technologies - Reader needs to be rewritten in flash with most of functionality, PixelBender works, more packages to be tested (VoIP, multicast, etc.)



# Brave New World Challenges

- Smaller screens, no “one size fit all” solutions allowed.
- Low memory, other processes can affect your behavior
- Low CPU specs, CPU throttling required for temperature/battery performance
- Heavy security imposed, VM barriers, no conventional interprocess communications
- Limited native platform



# Session Info

- Case study: Sales Automation Application
- Development single source code application for ALL platforms
- Development for small factor/keyboardless devices
- What to do when AIR falls short of native toolset
- Personal Cloud



# Popular models and DPI/distance approximation

Apple iPhone 4, iPod 4	960 x 640	3.5"	326dpi	320x210
Apple iPad 1, iPad 2	1024 x 768	9.7"	132dpi	760x580
BlackBerry PlayBook	1024 x 600	7"	170dpi	600x380
HTC Evo	800 x 480	4.3"	217dpi	380x230
Motorola Atrix	960 x 540	4"	275dpi	360x200
Motorola Xoom	1280 x 800	10.1"	150dpi	800x535
Samsung Galaxy Tab	1024 x 600	7"	170dpi	600x350
Desktop	1920 x 1200	24"	100dpi	1920x1200
Smart TV	1920 x 1080	50"	44dpi	800x535

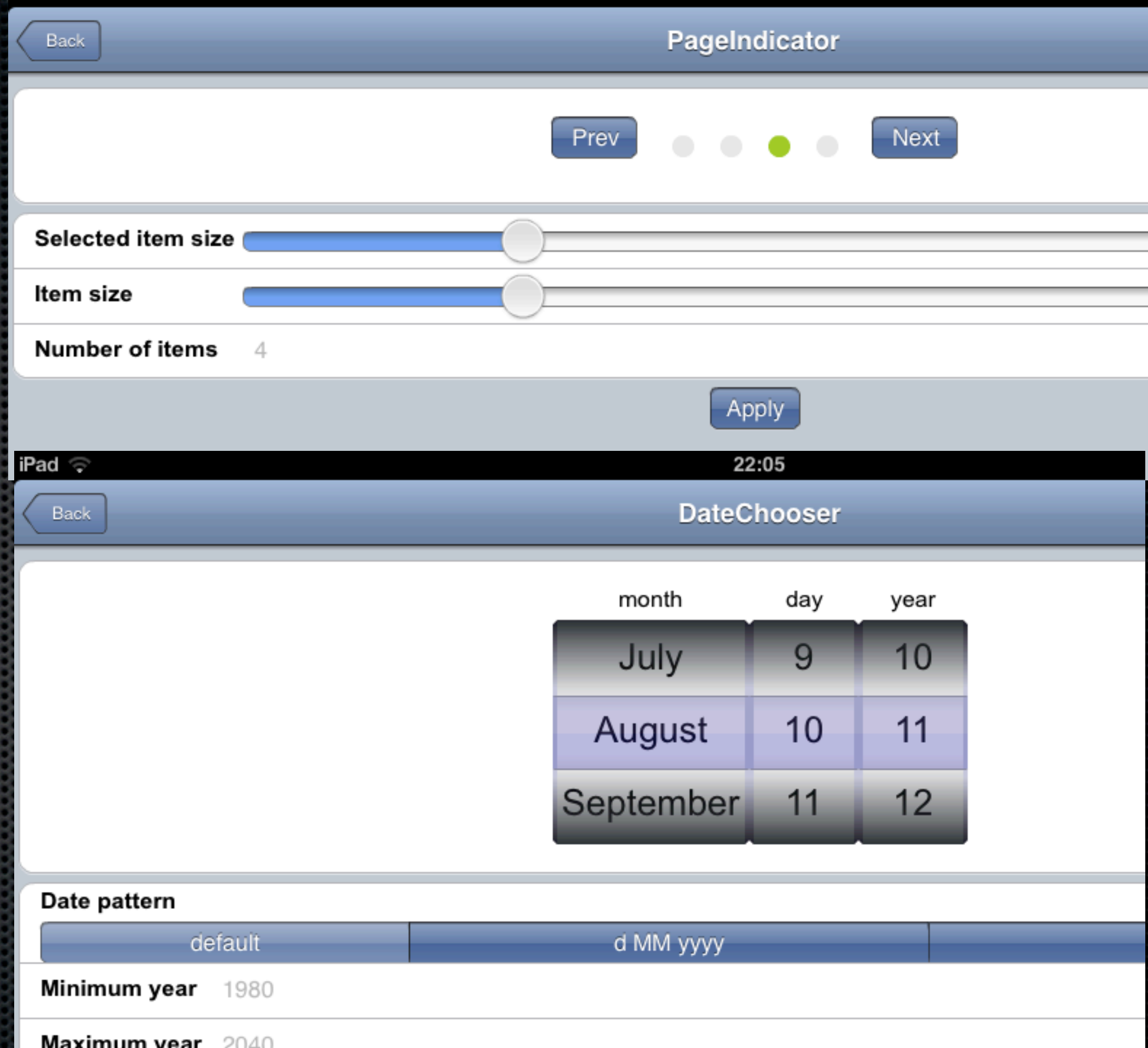
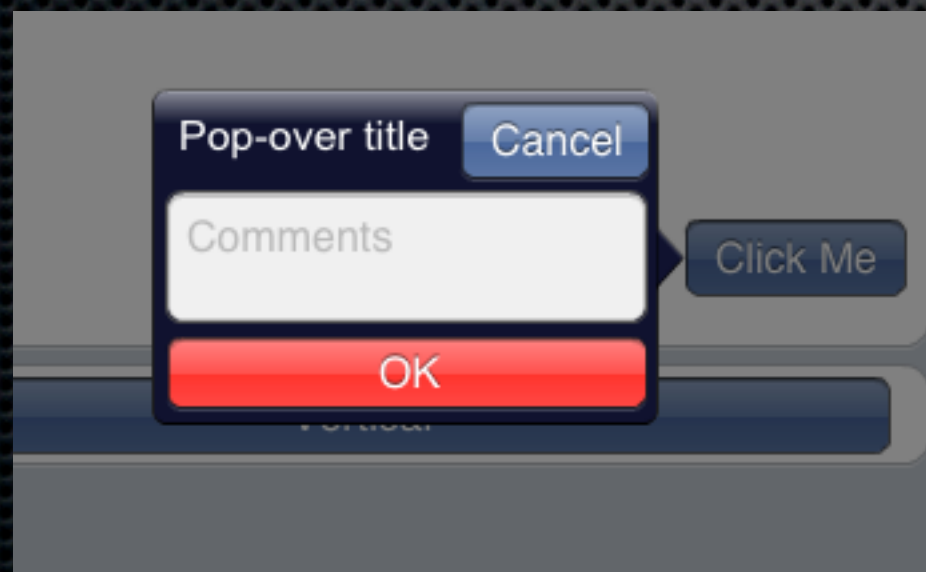


# Three Degrees of Separation

- Application Code - business code and controls, some layout
- Skin - How APPLICATION level controls and screens suppose to look like
- Theme - overall presentation, interactivity and capabilities of the PLATFORM



# Sample Controls

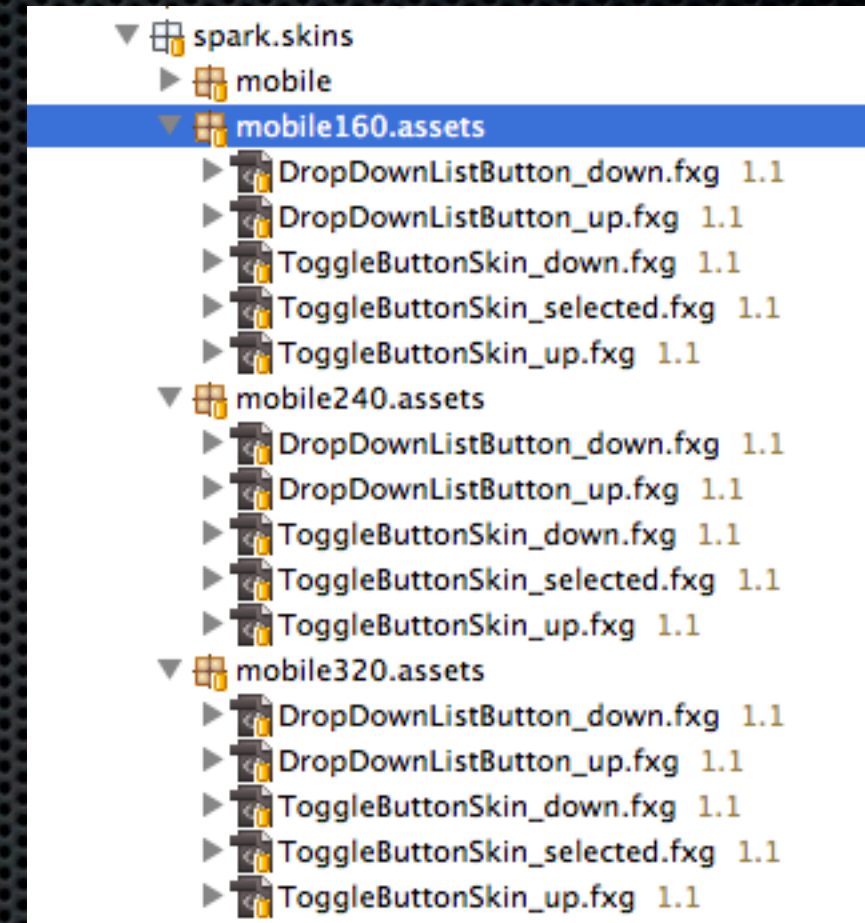




# DPI and CSS

```
@media (application-dpi: 160)
{
ActionBar {paddingBottom: 1;paddingLeft: 0;
paddingRight: 0;paddingTop: 1;    }
global{fontSize: 16pt;focusThickness: 2;}
}

@media (application-dpi: 320){
ActionBar {    paddingBottom: 2;    paddingLeft: 0;
paddingRight: 0;    paddingTop: 2;    }...
global{fontSize: 28pt;focusThickness: 3;}
}
```





# Incremental Approach to Styling

```
■ s|Button {      fontSize: 12;    }
```

```
@media all and (application-dpi: 160) {
```

```
    s|Button{fontSize: 10;}}
```

```
@media (application-dpi:240)and(os-platform: "IOS")
```

```
    { s|Button{fontSize: 11;}}
```

```
@media (application-dpi:240) and (os-platform:  
    "Android")      {
```

```
    s|Button {  fontSize: 13;  } }
```



# Tour d'Eskimo

```
▪ @media (os-platform:"ANDROID")  
  { .componentContainerStyle {skinClass:ClassReference  
    ("com.pialabs.eskimo.skins.AndroidContainerSkin"); }}  
  
@media (os-platform:"IOS"){  
  .componentContainerStyle {  
skinClass:ClassReference  
  ("com.pialabs.eskimo.skins.ContainerSkin");}}  
}
```



# AIR run-time changes

- Better support for native controls/look and feel
- Migration toward common set of the controls for mobile, desktop and TV
- Changes to workflow - better designer in FlashBuilder, removing Catalyst, better support of FXG in Adobe CS tools.



# Keyboard and Text input

- StageText skin TextInput/TextArea - native (platform) control - not UIDisplay control
- Much faster, extra functionality, overlays to editing toolbar
- `myTextInput.autoCapitalize = AutoCapitalize.NONE;`  
`// Set the keyboard type for entering e-mail`  
`// addresses. On platforms which support it, such a`  
`keyboard may include dedicated '@' and '.com' keys.`  
`myTextInput.softKeyboardType = softKeyboardType.EMAIL;`  
`// display a "next" label return key.`  
`myTextInput.returnKeyLabel = ReturnKeyLabel.NEXT;`

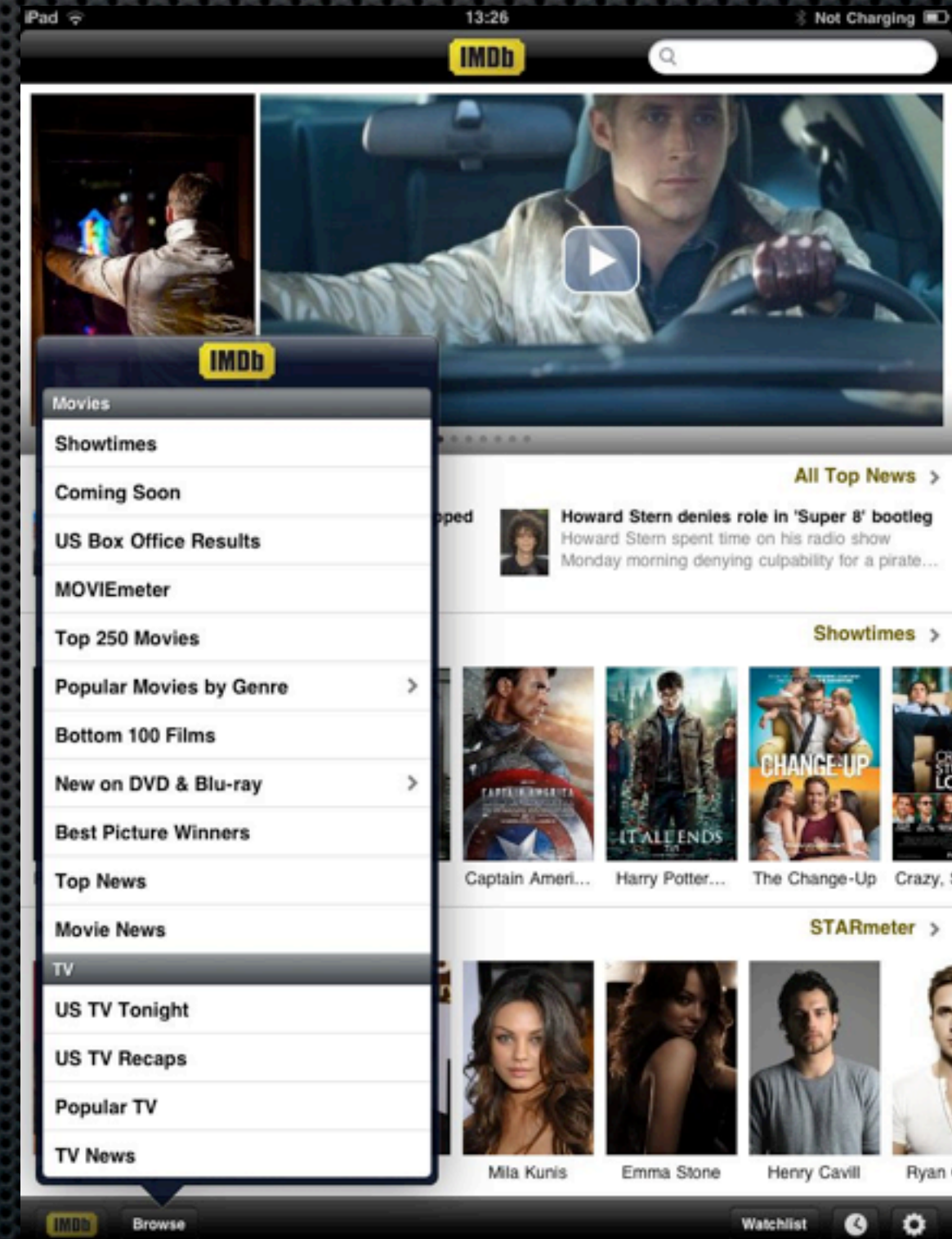
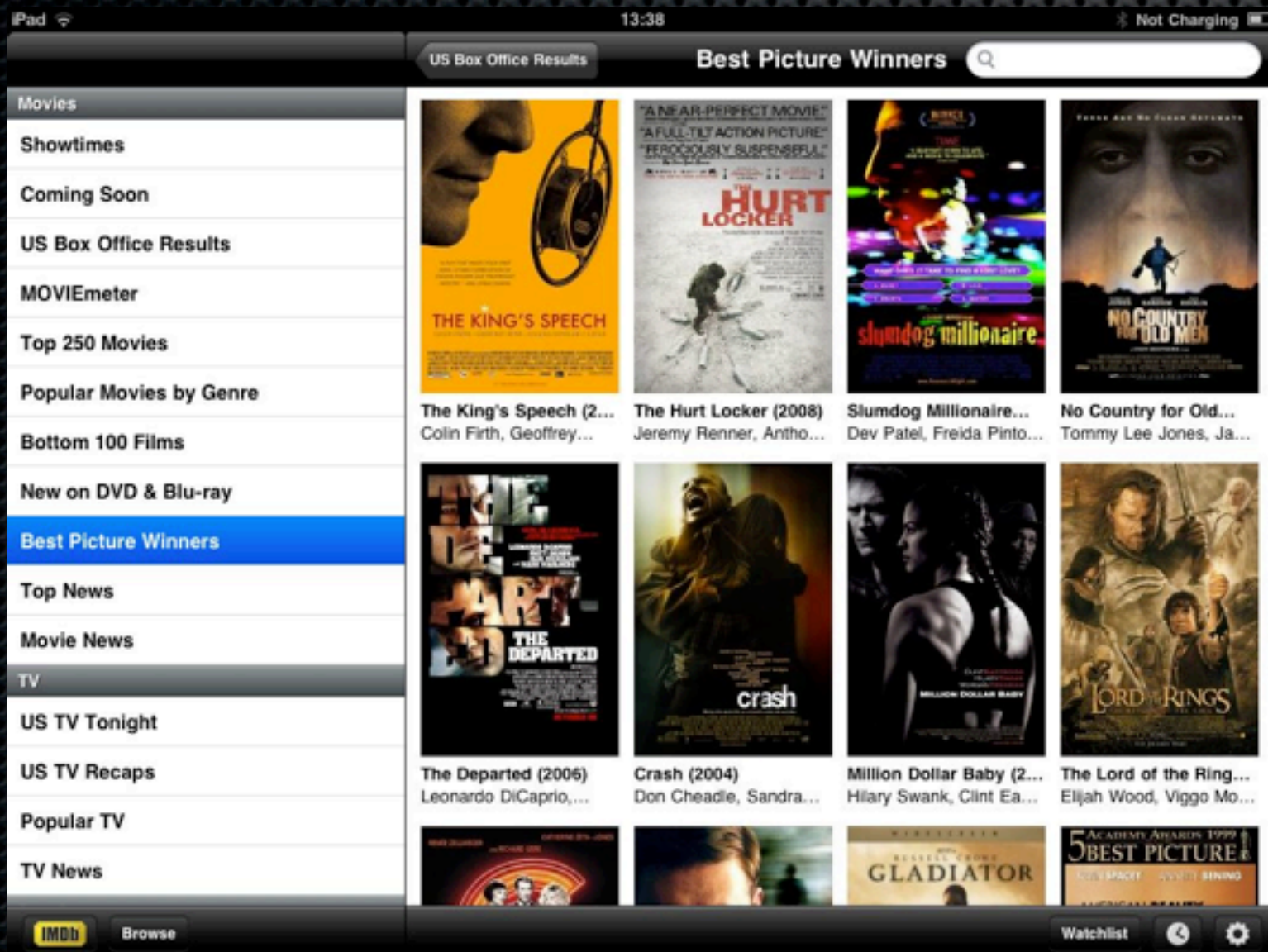


- `<s:TextInput width="100%" id="toAddress" softKeyboardType="email" autoCorrect="false" returnKeyLabel="next"/>`
- `<s:TextInput width="100%" id="Subject" autoCapitalize="word" autoCorrect="true" returnKeyLabel="next"/>`
- `<s:TextArea width="100%" height="100%" id="bodyText" autoCapitalize="sentence" autoCorrect="true"/>`



# Merging large phone and small tablet UI

- Callouts
- SplitViewNavigators





# Components to Avoid for Mobile and ANY Future projects

DataGrid

- ComboBox and DropDownList
- NumericStepper
- ToggleButton
- VideoDisplay and VideoPlayer
- VSlider
- TabBar (the component used in TabbedViewNavigator is actually a ButtonBar)
- TitleWindow/Panel/any container with built-in scroller



# Native Platform Integration

- High performance, low resource consumption
- Complete access to all APIs
- Powerful frameworks - simple, well documented, robust
- Integration techniques are currently limited, TV native extensions released Q4'10, all platforms coming Q3'11



# Native Platform Integration

- New deployment model - native slipstreaming - coming to all platforms
- You now are able to provide “fallback API” in AS3 as library, and native platform library to be loaded in the native package (jar for Android APK, DLL for Windows, etc)



# Native API tools

DEVICE	Android	iOS Devices	Blackberry Playbook	Windows	AIR for TV
TOOLS	Java API with Android SDK, C API with Android NDK	C, Objective-C, C++	C or Java	C, C++	C API

<http://download.macromedia.com/pub/developer/devices/DevelopingActionScriptExtensionsForAdobeAIR.pdf>



# Beta for AIR 3 is out

- Captive run-time packages native libraries along with run-time and your flex code
- `adt -package -target ( apk | apk-debug | apk-emulator | apk-captive-runtime ) ( CONNECT_OPTIONS? | -listen <port>? ) ( -airDownloadURL <url> )? SIGNING_OPTIONS <output-package> ( <app-desc> PLATFORM-SDK-OPTION? FILE-OPTIONS | <input-package> PLATFORM-SDK-OPTION? )`
- Packaging for TV - additional settings in the configuration file within AIR package



# Case Study: SuranceBay

- Startup funded by Farata Systems, we define technologies to be used
- No conventional funding - every application has to be self sustainable in 6 month from the start, profitable in 12 month
- We can use whatever we want as long software is delivered on time and within the costs / quality parameters
- Software for full front-end, sales force and back-end - Web, Mobile and AIR



# Surancebay 1.0

- Conventional Flex 3/AIR v2.6 applications with Java backend
- Integrates Acrobat as we all know today's insurance is all about forms
- Replaces paper processes with electronic forms and information scrapping
- Back-office efficiency is primary target - to bring down 30 minutes error prone process to 2 minutes - high density UI for trained specialists
- All about making back-office more efficient, requires training, high bandwidth connections and desktops with high resolution displays



# SuranceBay 1.0 Demo

- Agent Data Entry
- OCR
- Forms generation



# Surancebay 2.0

- Now that we have back offices, it is time to enable the front ones
- Hundreds of thousand agents need automation of day to day operations
- Currently use paper forms, disparate carriers systems, CRM systems, dealing with medical appointments - complete mess
- Highly mobile, always on the phone, disorganized and undertrained - prosumers at best
- Application has to be data driven and adaptable to the person using it



# Challenges: Moving from Back-Office to Front-Office and Web

- Single interface for Mobile, Web and AIR
- No “lowest denominator” approach
- Full access to the platform advantages
- Cross platform integration
- Usability



# Bridging the Gap between Mobile and Desktop Flex Frameworks

- Add mobilecomponents.swc to the Web/desktop projects
- Provide missing mobile skins for Desktop/Web environment
- Provide missing components for Web / Desktop extensions (like Modules) for Mobile Platforms
- Provide uniform Validating Containers to be used in both environments
- Aggregate existing Adobe themes in the new Mobile and Desktop Themes



# Containers and Layout Managers

- No fixed layouts - does not work with various DPIs
- Layout managers all the way
- No containers with embedded scrollers as they interfere with keyboard interaction
- Use of Navigators



# Keyboard and mouse/touch

- Limit data-entry to the top of the screen
- Skin for easier touch interface, especially for platforms that allow touch input
- Extensive use of overlay controls for editing, separate data entry from viewing
  - DropDown replacement
  - In-Place editing



# Integration with other programs (Acrobat)

- Acrobat has very limited functionality on mobile ( no scripting, forms, no guaranteed level of PDF version support)
- Similar problems on web - no cross scripting, lack of control of PDF position and display settings
- No usable solution outside of Desktop version of AIR



# Converting other formats to Flash

- Open source projects like SWFTTools
- Produce static SWF file from PDF
- Automatically convert PDF Forms to the Controls/Skins or Dynamic forms with static SWF background



# Personal Cloud

- Laptops, tablets, phones
- Global and Corporate Cloud Services
- Personal Devices
- GPS
- Camera
- Wi-Fi/Bluetooth/USB



# Connectivity for Personal Cloud

- Server-based, where all communications are routed through the (external) servers
- Point-to-point, completely independent of external world, flexibly configurable
- Mesh of server and point-to-point topologies




# RTMFP Protocol


- P2P in case of authorization server
- Multicast otherwise
- Ideal for local networks
- Potential problems: security, chatter
- Solutions: securing the network itself, as3crypto, FlashMedia Server allows to start secured connections with AES 128 bit, Cumulus



VoiceRecognitionMP



Identity















Login 

User:

Device:

Password:

Auto Login ☒

	 Mac	Adobe Macintosh/Mac OS 10.7.0	
	 GTablet	Android Linux/Linux 2.6.36.3-gb899528	
	 GPhone	Android Linux/Linux 2.6.35.7-59463-g52630a3	
	 iPhone	Adobe iOS/iPhone OS 4.3.5 iPhone3,1	
	 iPad	Adobe iOS/iPhone OS 4.3.5 iPad2,1	



# Examples of Personal Cloud Devices and Applications



Hi Definition Camera, no need to send large images to server as local processing is available



Consumer operated medical testing devices with bluetooth / plugin capabilities, medical record devices



External nets: Credit card processing, audio recording, VoIP integration, voice recognition, stress analysis



Combo-devices, cross integration between Android and conventional platforms



# Integrating with non-computer equipment

- Demo - Integration with any digital camera by using networked SDHC cards
- Either disk mode or direct networking when no hotspot available



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