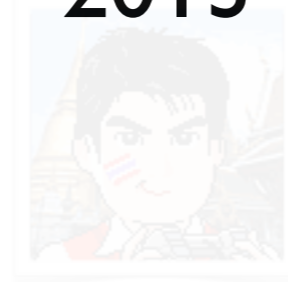




Wireless Application Design

Witcha Feungchan
2013





Wireless Application Design

Witcha Feungchan

2013





Wireless Application Design

Witcha Feungchan

2013



Overview

- Wireless Devices
- Limitation of hardware
- Screen = Real estate
- Auxiliary Features
- Framework vs Custom
- HCI
- UI & UX design guide

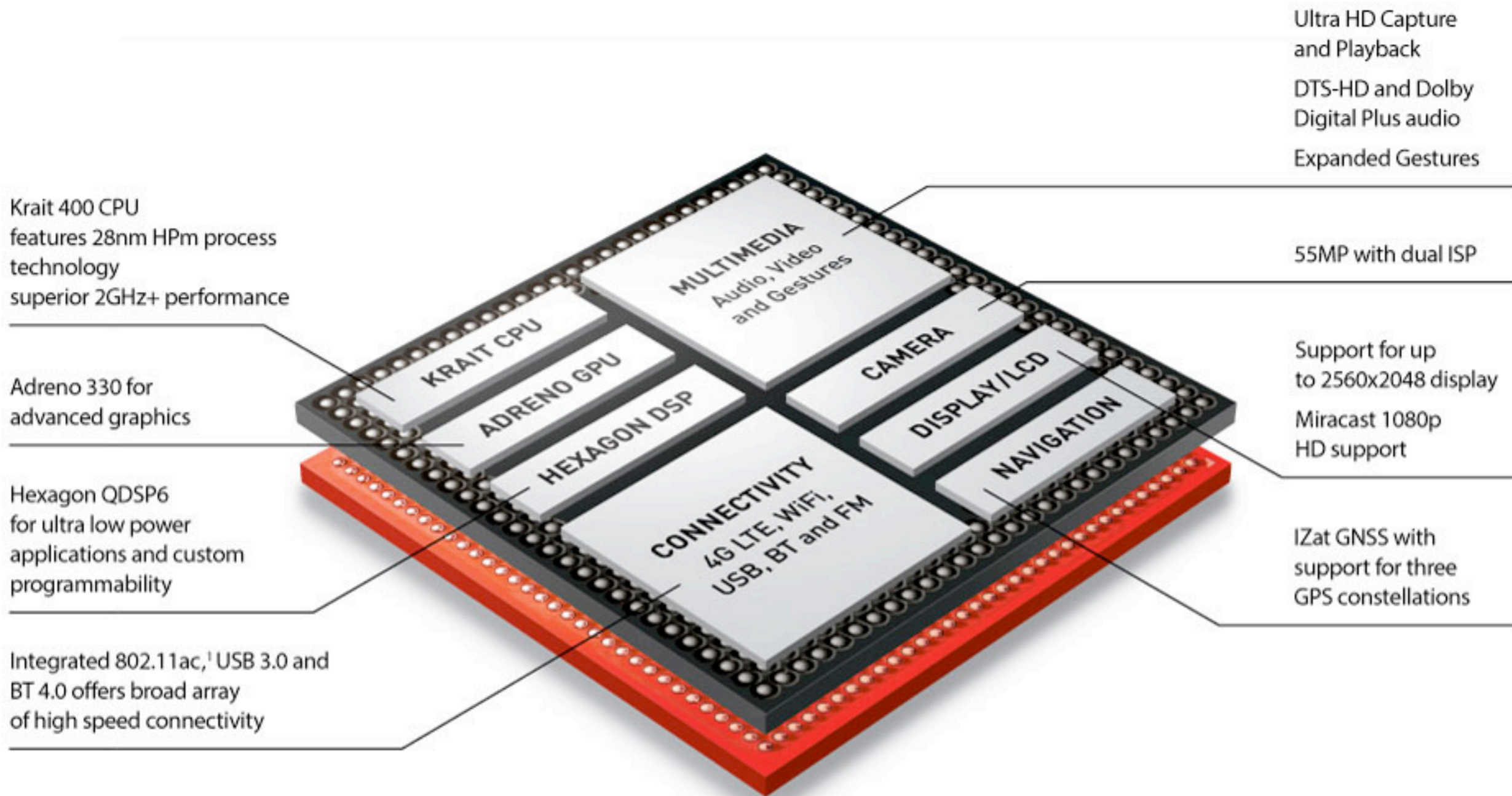
Wireless Devices

- Focusses on Smart phones and Tablets
- Platforms: IOS, Android, Windows mobile, etc.
- Design concept may apply to all

Hardware

- SOC (System On Chip)
- CPU speed
 - 1 GHz minimum for new devices
 - Multi-cores for high-end devices this year
- GPU
 - Supports 3D for game/ HD content
 - Most CPU has built-in graphic unit

Hardware



<http://www.qualcomm.com/snapdragon/processors/800>

Hardware cont.

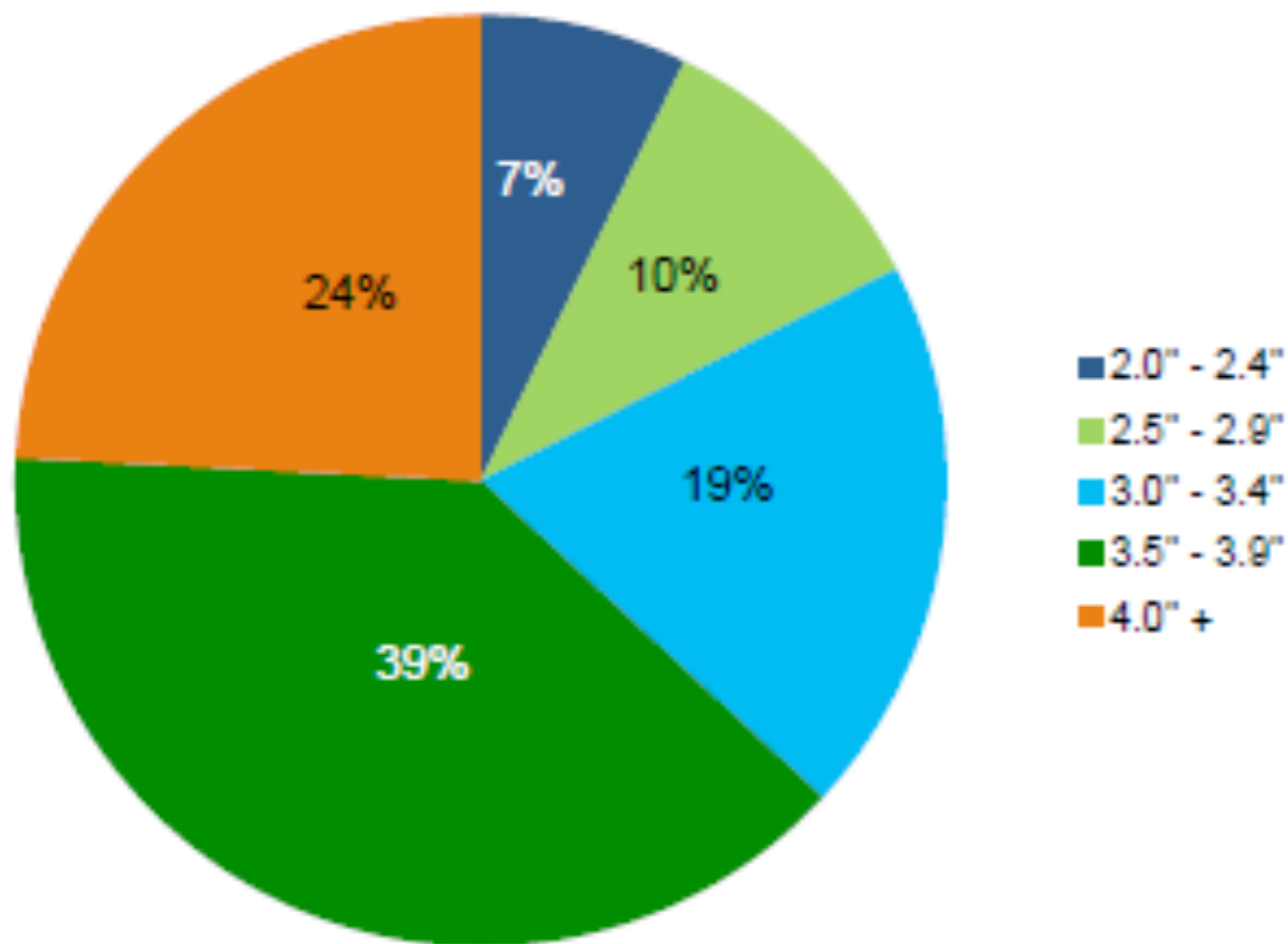
- Memory
 - 64-2048 MB
 - >512MB is recommended for multi-tasking
- Storage
 - Flash technology | GB minimum
 - Built-in & Removable flash memory

Display Screen

- LCD Based technology
- OLED Based technology
- Resolutions
- Touch technology

Display Screen

Share of Smartphone Sales by Screen Size - Q4 2010

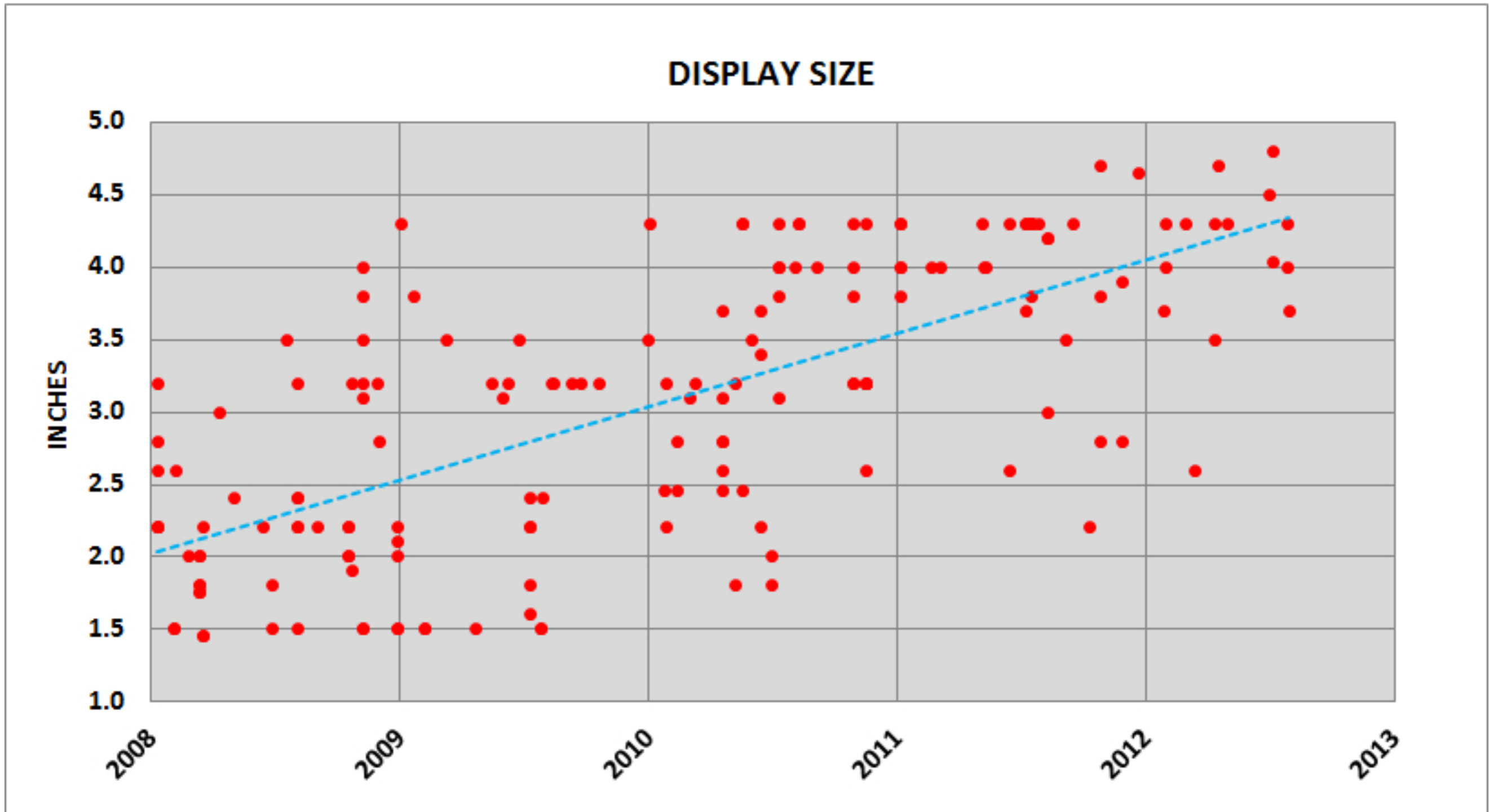


Source: The NPD Group, Consumer Tracking Service, Mobile Phone Track

Apple	iPad	1024 x 768
	iPhone	320 x 480
	iPhone 4	640 x 960
	iPod Touch	320 x 480
Samsung	Galaxy Ace	320 x 480
	Galaxy Mini	240 x 320
	Galaxy S	480 x 800
	Galaxy S II	480 x 800
Google	Nexus One	800 x 480
Dell	Streak	800 x 480
Motorola	Atrix	540 x 960
	Xoom	1280 x 800
	CLIQ 2™	480 x 854
	CITRUS™	320 x 480









<http://www.geekwithlaptop.com/the-effect-of-screen-size-on-smartphone-sales>

Display Screen



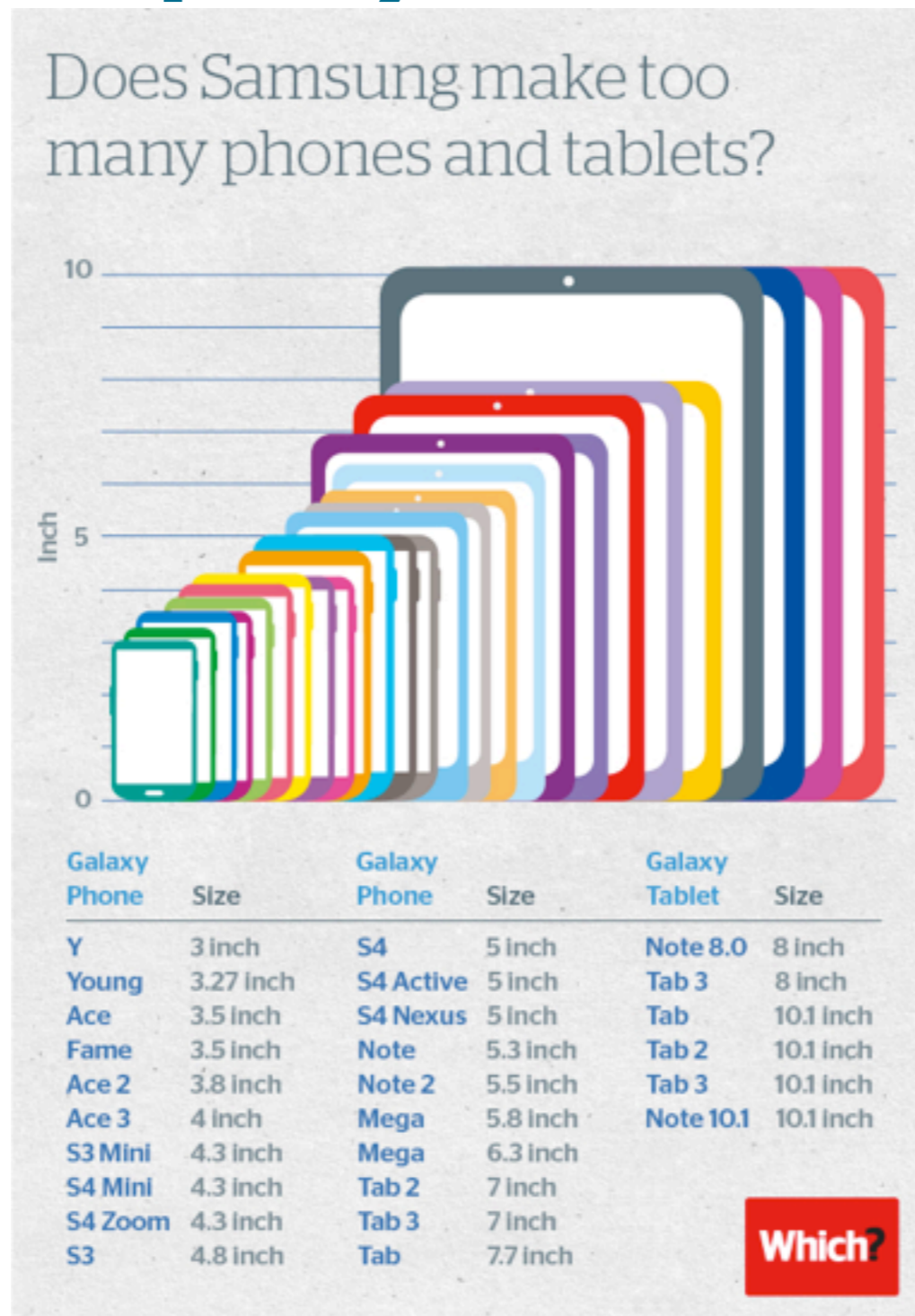
http://www.wired.com/images_blogs/gadgetlab/2013/04/IHS_Chart_display.jpg
<http://www.gizmag.com/smartphone-comparison-2013/27259/pictures#6>
<http://blogs.which.co.uk/technology/wp-content/uploads/2013/06/Does-Samsung-make-too-many-phones-and-tablets-final.jpg>

Display Screen

Galaxy S 4	HTC One	iPhone 5	Optimus G Pro	BlackBerry Z10	Xperia Z	Nexus 4	Galaxy Note II
							
5"	4.7"	4"	5.5"	4.2"	5"	4.7"	5.5"
x 1920 x 1080	x 1920 x 1080	x 1136 x 640	x 1920 x 1080	x 1280 x 768	x 1920 x 1080	x 1280 x 768	x 1280 x 720
441ppi	468ppi	326ppi	401ppi	355ppi	441ppi	318ppi	267ppi

http://www.wired.com/images_blogs/gadgetlab/2013/04/IHS_Chart_display.jpg
<http://www.gizmag.com/smartphone-comparison-2013/27259/pictures#6>
<http://blogs.which.co.uk/technology/wp-content/uploads/2013/06/Does-Samsung-make-too-many-phones-and-tablets-final.jpg>

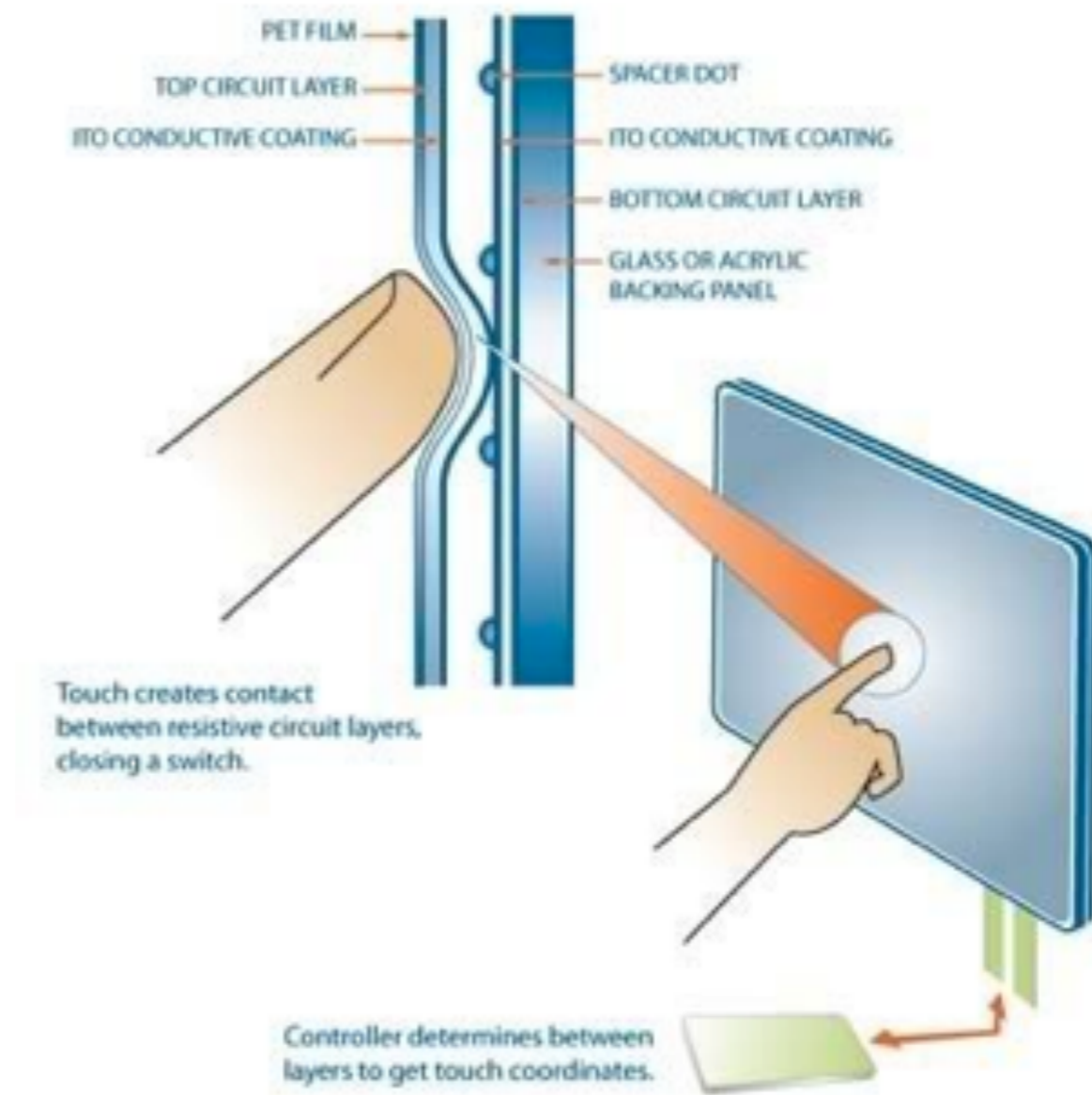
Display Screen



http://www.wired.com/images_blogs/gadgetlab/2013/04/IHS_Chart_display.jpg
<http://www.gizmag.com/smartphone-comparison-2013/27259/pictures#6>
<http://blogs.which.co.uk/technology/wp-content/uploads/2013/06/Does-Samsung-make-too-many-phones-and-tablets-final.jpg>

Touch Screen

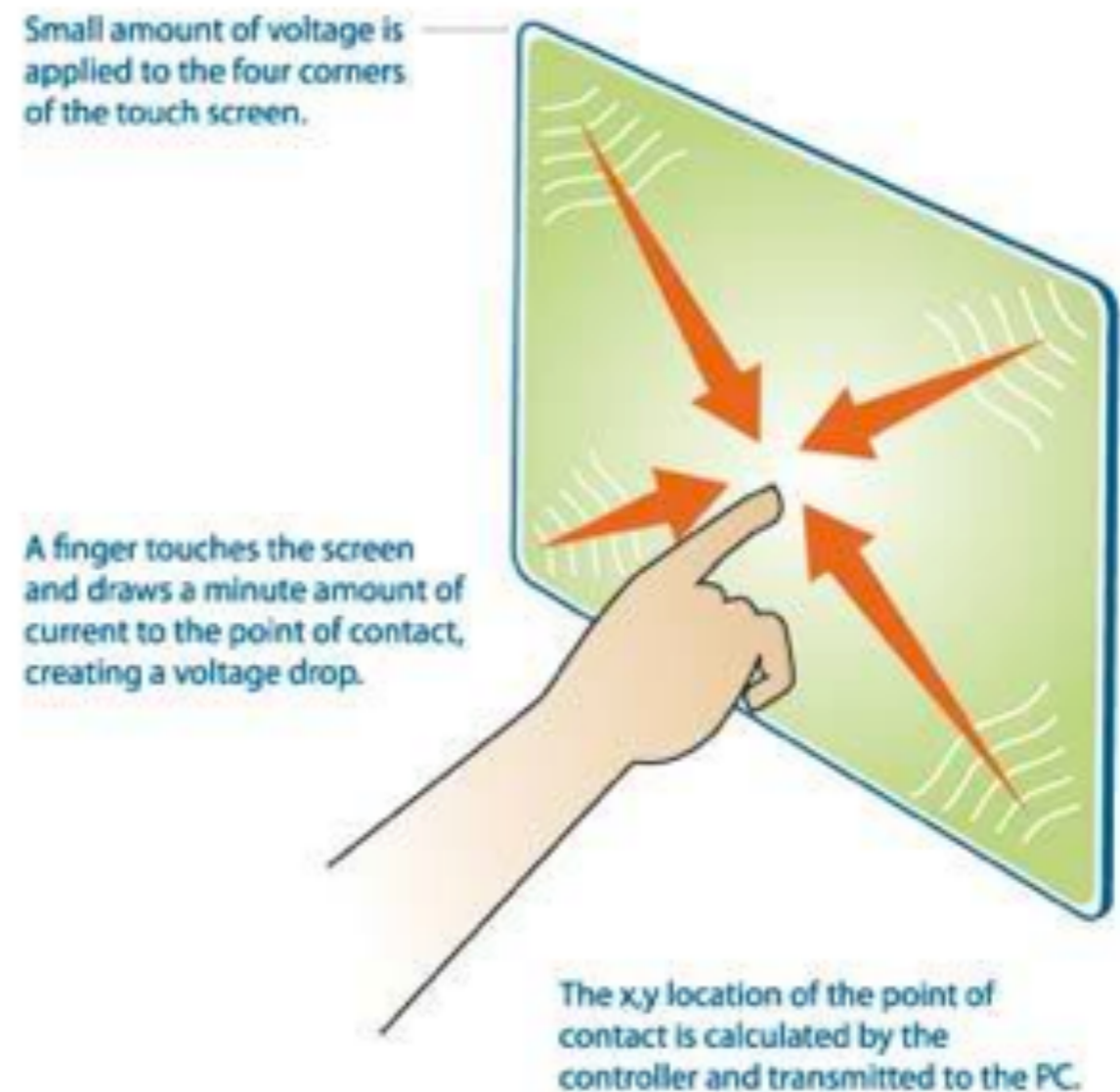
- Resistive
- Capacitive
- Acoustic wave



Bizzntech. (2010). Resistive and Capacitive touch screen.
Erodov. (2010). Surface acoustic wave.

Touch Screen

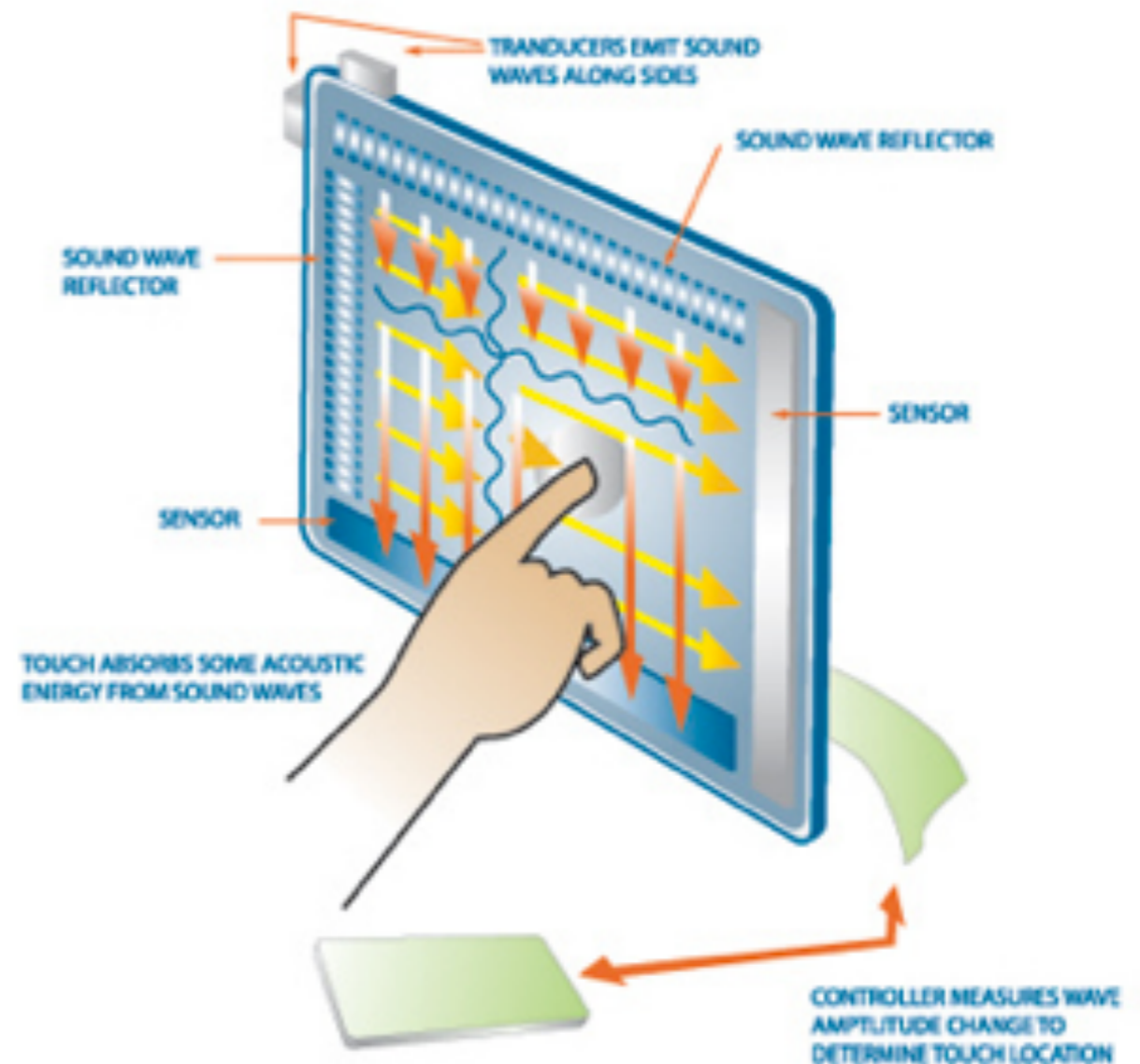
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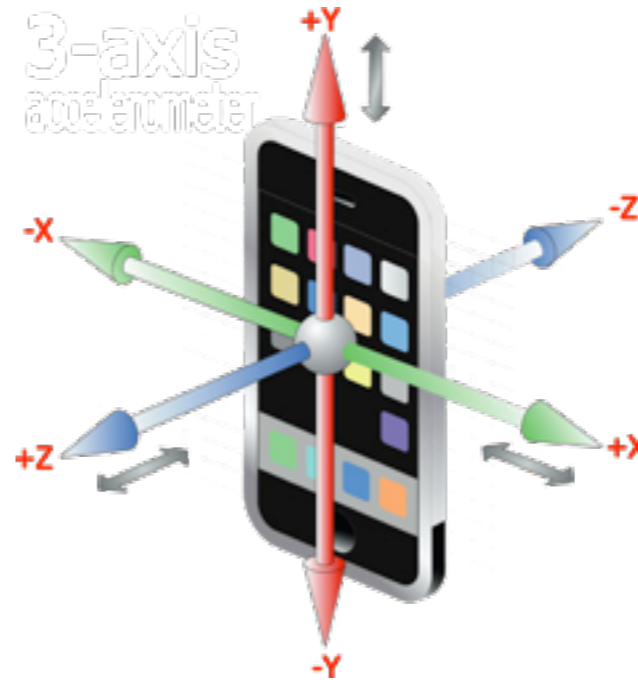
Bizzntech. (2010). Resistive and Capacitive touch screen.
Erodov. (2010). Surface acoustic wave.

Touch Screen cont.

Technologies	Resistive	Capacitive	Surface acoustic wave
Touch input	Anything	Finger only	Works with some inputs
Detection technic	Electric Voltage	Electric Current	Waveform
Material	Plastic coated with glass	Glass	Glass
Build	Easy Flexible	Hard Breakable	Hard Breakable
Cost	Cost effective	Expensive	Expensive
Pros	<ul style="list-style-type: none"> - Durable - 30 Million hits - works with every input 	<ul style="list-style-type: none"> - 90% of Opacity - 20 Million hits 	<ul style="list-style-type: none"> - Clear and bright - 50 Million hits
Cons	<ul style="list-style-type: none"> - 75-88% of brightness 	<ul style="list-style-type: none"> - Finger only 	<ul style="list-style-type: none"> - Use in clean environment - Finger and some

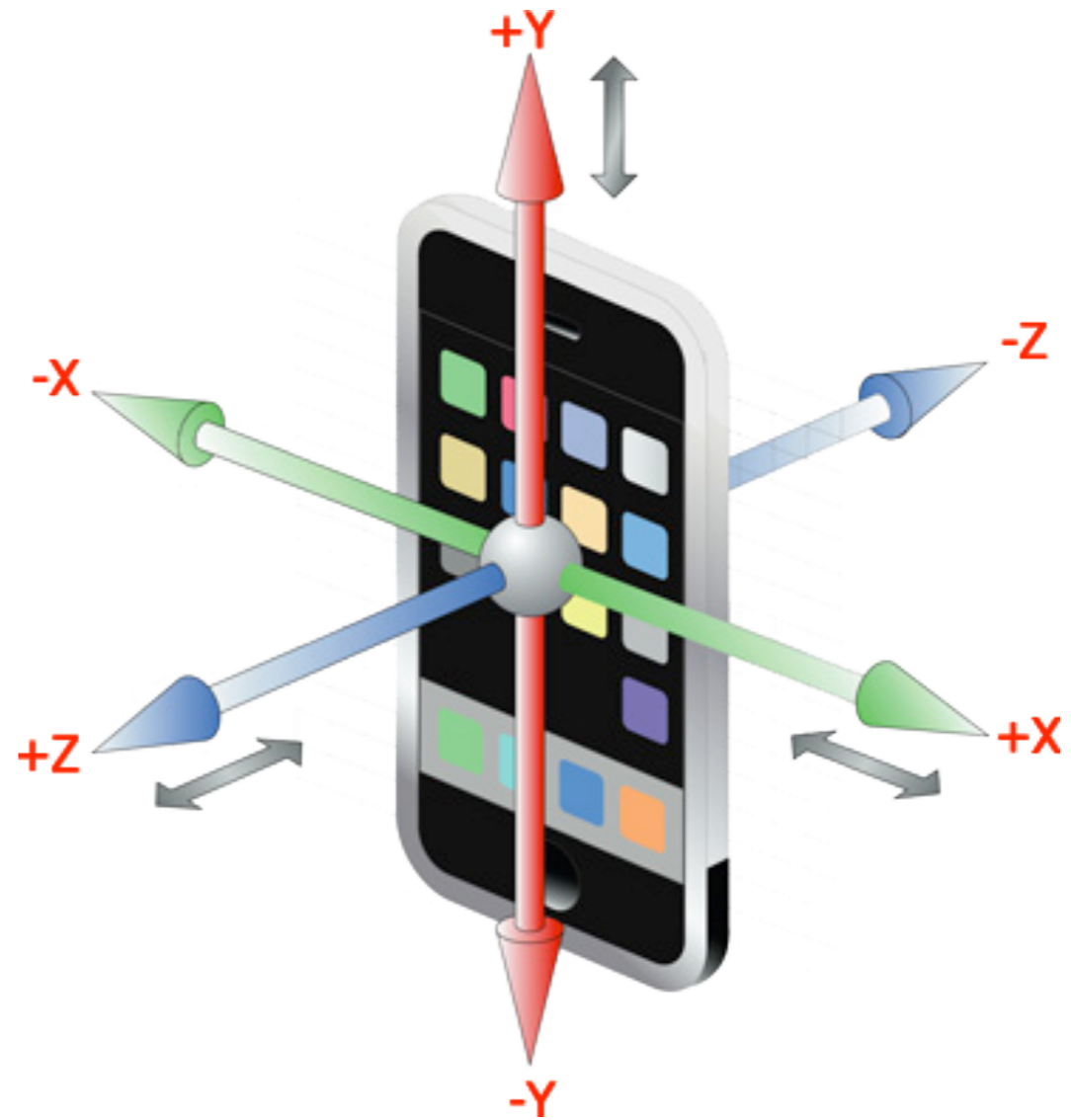
Auxiliary features

- Sensors
 - Accelerometer
 - Gyroscope
 - Camera
 - Magnetometer
 - GPS / A-GPS
 - Proximity
 - Ambient



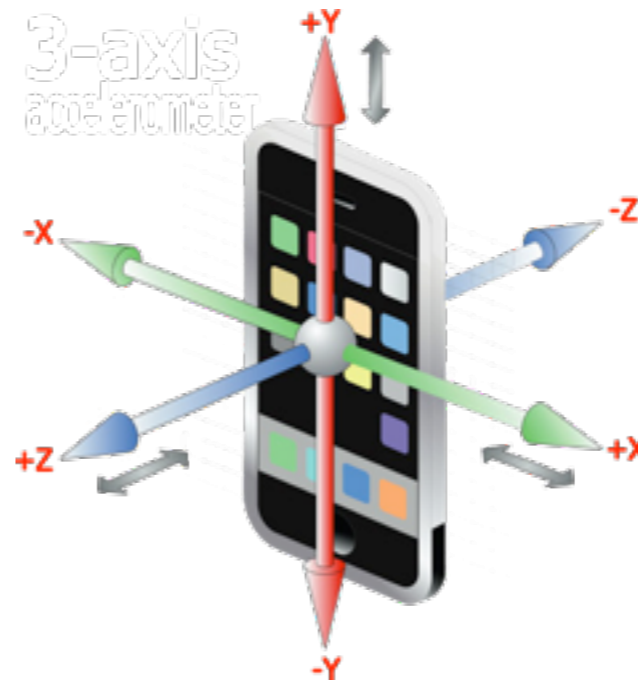
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Auxiliary features

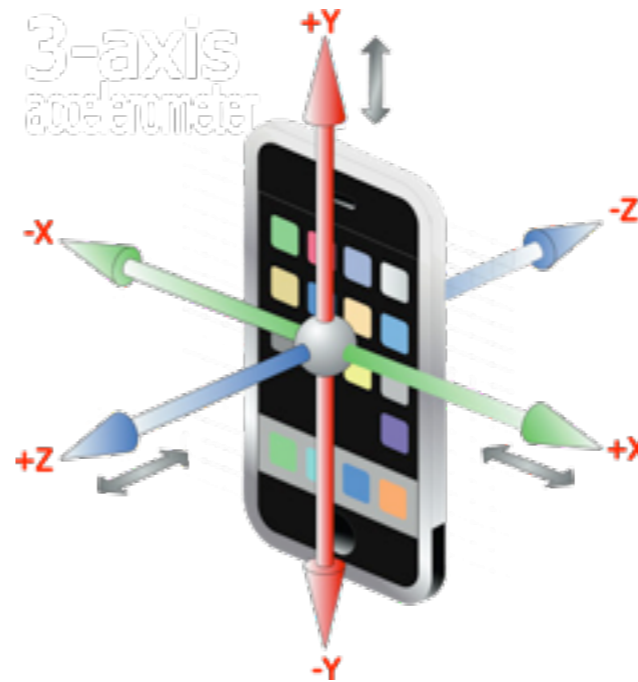
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3-axis
gyroscope



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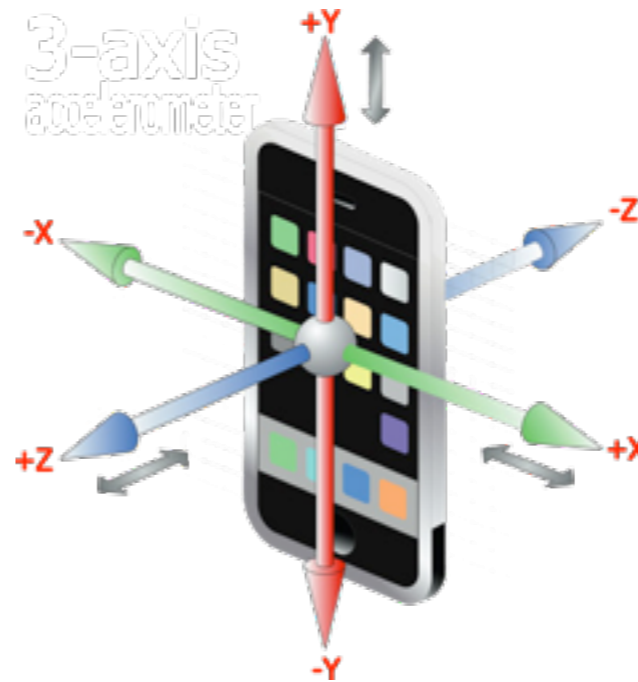
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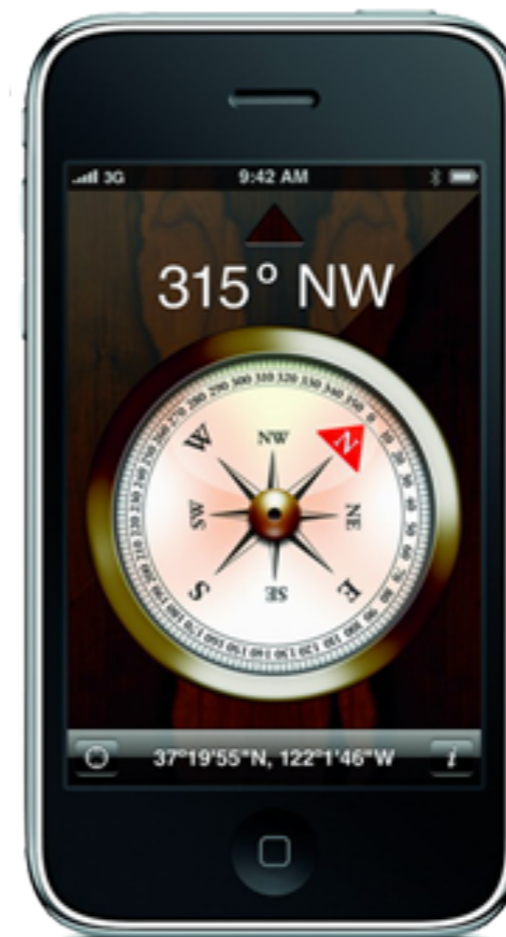
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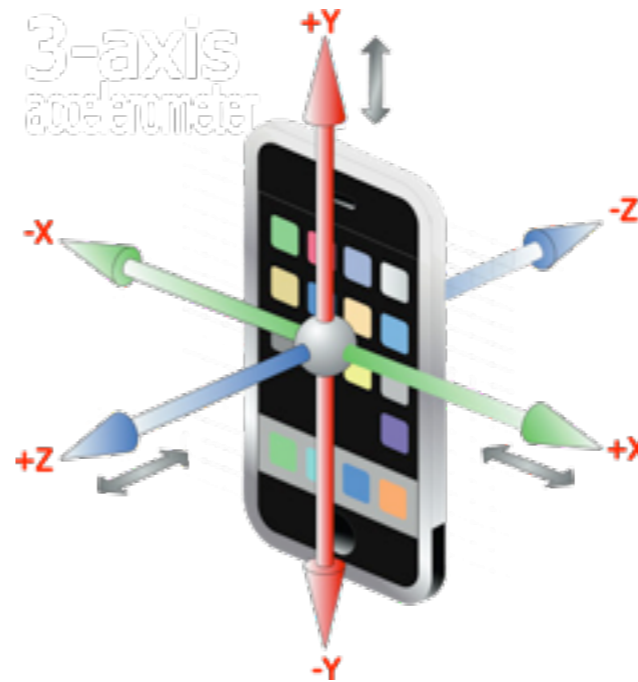
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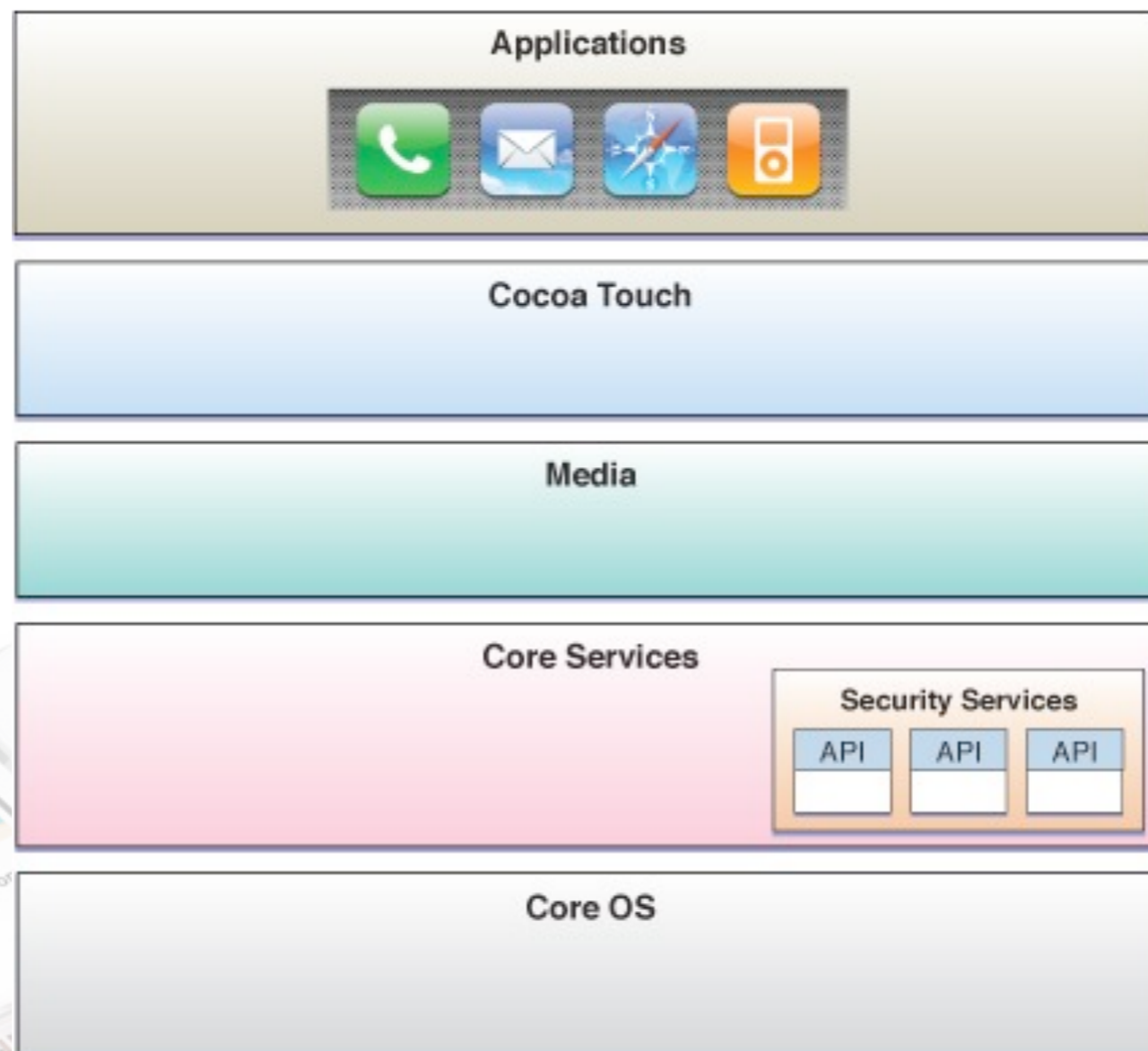


Auxiliary features

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 - Proximity
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IOS Framework



We will discuss later.

Human Computer Interaction

- Recommend to take A. Wasu's class
- One hand operation for mobile phone
- Touch based input/Rarely use keypad or Joystick
- Using in short period of time
- Responsive Application
- Reduces mistakes in both input and output
- Immediate & reasonable feedback

IOS Human Interface Guidelines



[Download](#)

<http://developer.apple.com/library/ios/#documentation/userexperience/conceptual/mobilehig/Introduction/Introduction.html>
<http://developer.apple.com/library/ios/navigation/>

IOS Human Interface Guidelines

The screenshot shows the Apple Developer website's iOS Developer Library. The page is titled "iOS Developer Library" and features a search bar. The main content area is divided into sections: "Overview", "Getting Started", "Required Reading", and "Featured". The "Getting Started" section is active, displaying a list of documents for learning the basics of iOS development. Below this, a table lists various documents with columns for Title, Resource Type, Topic, Framework, and Date.

Getting Started Documents:

- IOS Overview
- Learning Objective-C: A Primer
- Tools for iOS Development
- Creating an iPhone Application
- A Short Practical Guide to Blocks

Documents Table:

Title	Resource Type	Topic	Framework	Date
AVPlayerDemo	Sample Code	Audio & Video Video	AVFoundation	2011-06-10 Content Update
Understanding and Resolving Code Signing Issues	Technical Notes	Tools & Languages		2011-05-23 Content Update
Adding In App Purchase to your iOS Applications	Technical Notes	General	StoreKit	2011-05-23 Minor Change
StitchedStreamPlayer	Sample Code	Audio & Video	AVFoundation	2011-05-16 Content Update
Xcode Keyboard Shortcuts and Gestures	Guides	Tools & Languages IDEs		2011-05-07 Content Update
Repositories Organizer Help	Xcode Tasks	Tools & Languages IDEs		2011-05-07 Content Update
Log Navigator Help	Xcode Tasks	Tools & Languages		2011-05-07

[Download](#)

<http://developer.apple.com/library/ios/#documentation/userexperience/conceptual/mobilehig/Introduction/Introduction.html>
<http://developer.apple.com/library/ios/navigation/>

IOS Great Apps

- Based on Platform and HI Design
- Clear Definition
- Focuses on User Experience
 - look from every corner
- Users like to see IOS technologies in Apps
- Custom Artwork
- We are Visual creature.

IOS Platform

- Display means everything
 - Visual
 - Input & Output
 - Content
 - Rule of 44
 - Portrait vs Land Scape

iPad	1024 x 768
iPad ret.	2048 x 1536
iPhone	320 x 480
iPhone 4 ret.	640 x 960
iPhone 5 ret.	1136 x 640
iPod Touch	320 x 480

IOS Platform cont.

- Gestures action
 - Tap
 - Drag
 - Flick
 - Swipe
 - Double tap
 - Pinch
 - Hold
 - Shake

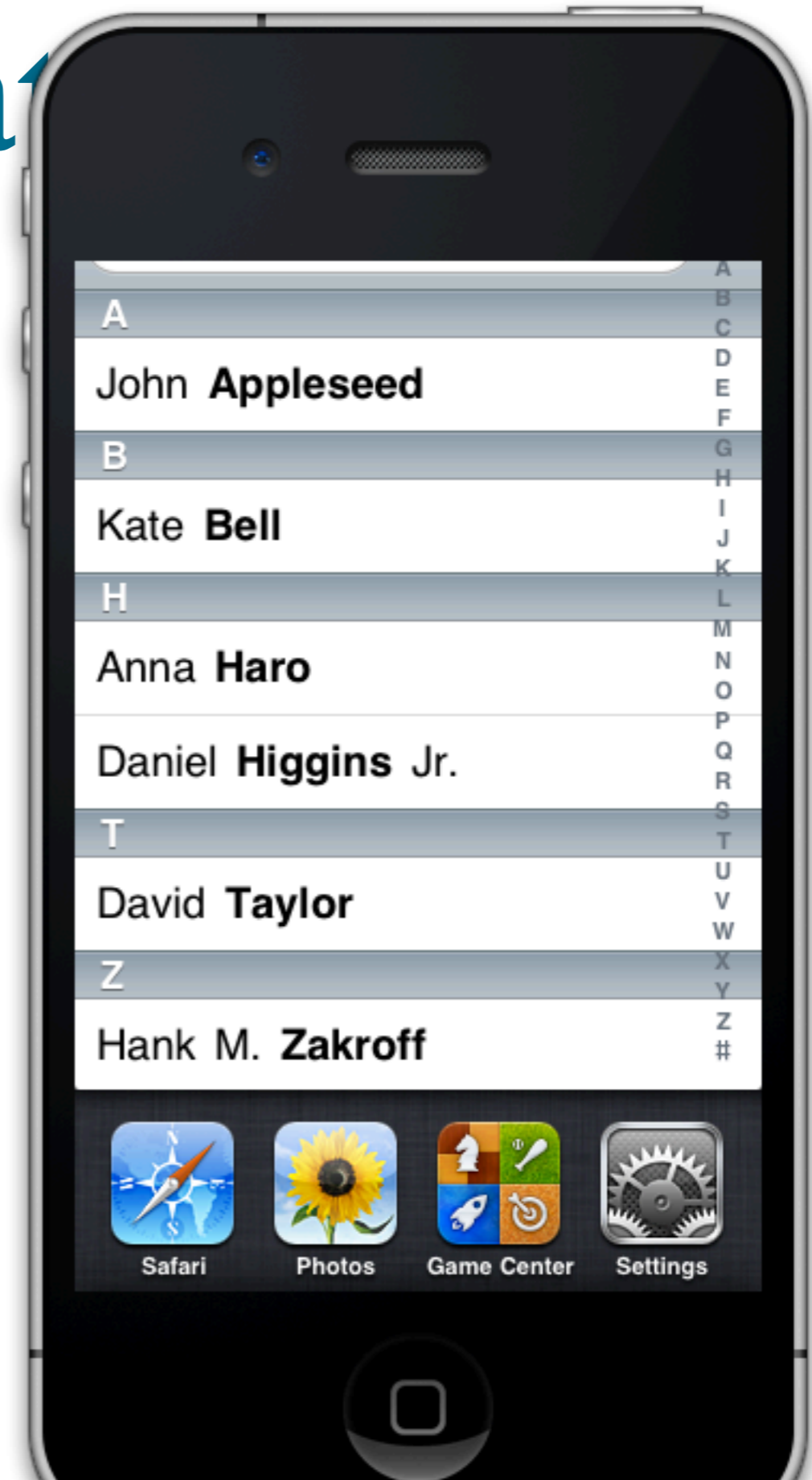
IOS Platform

- One App at a time
- Single Window
- Multi-tasking
- Less Help



IOS Plat

- One App at a time
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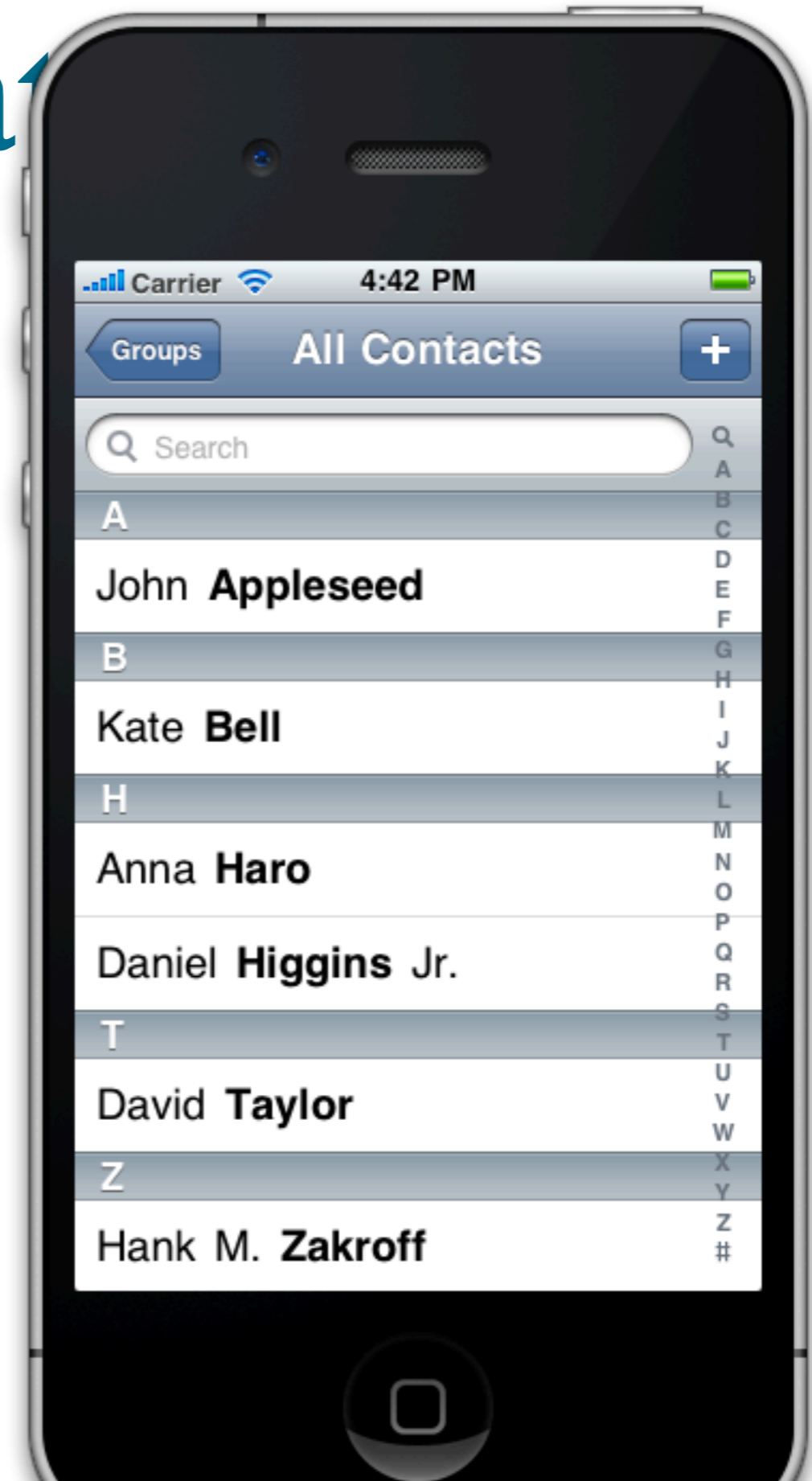
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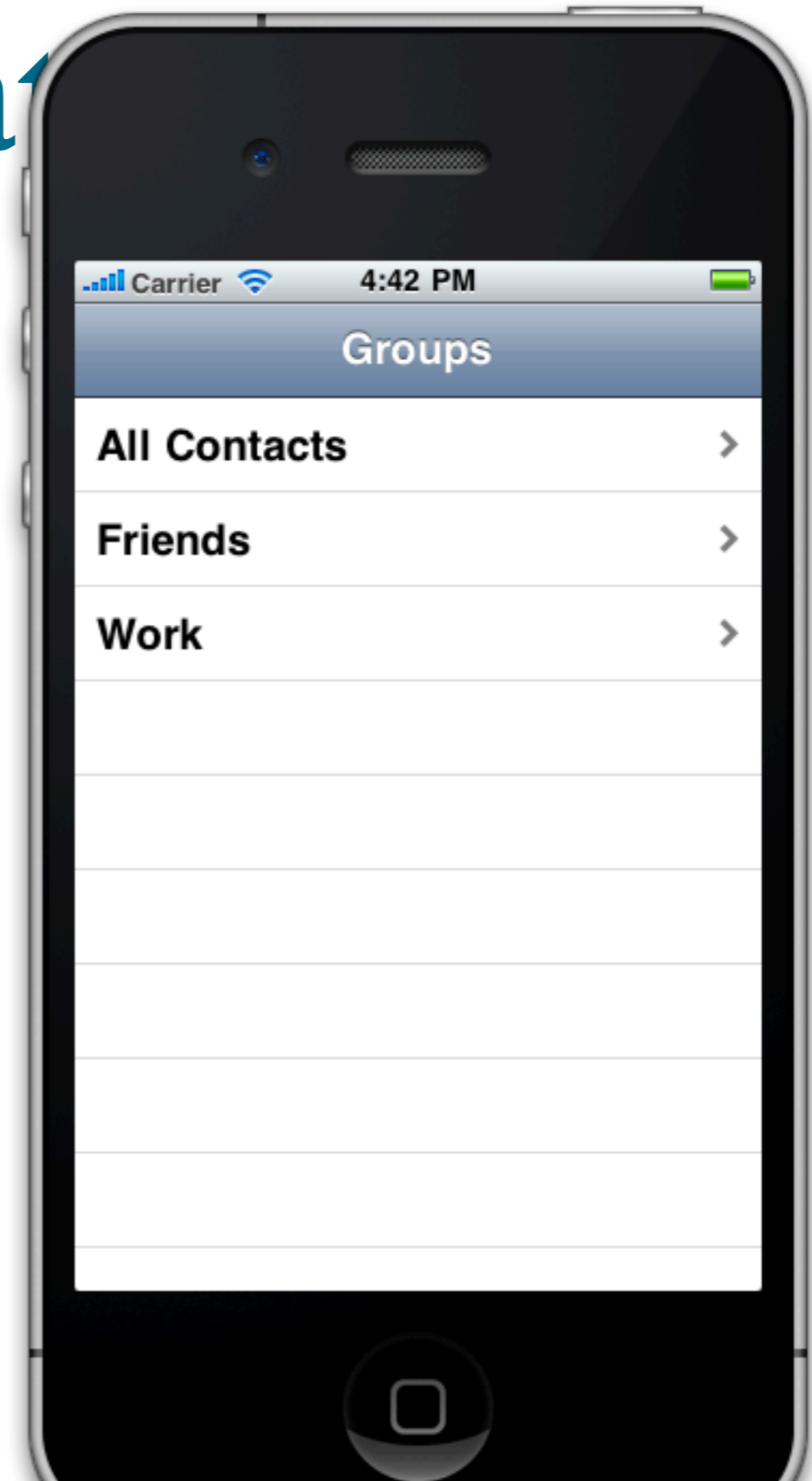
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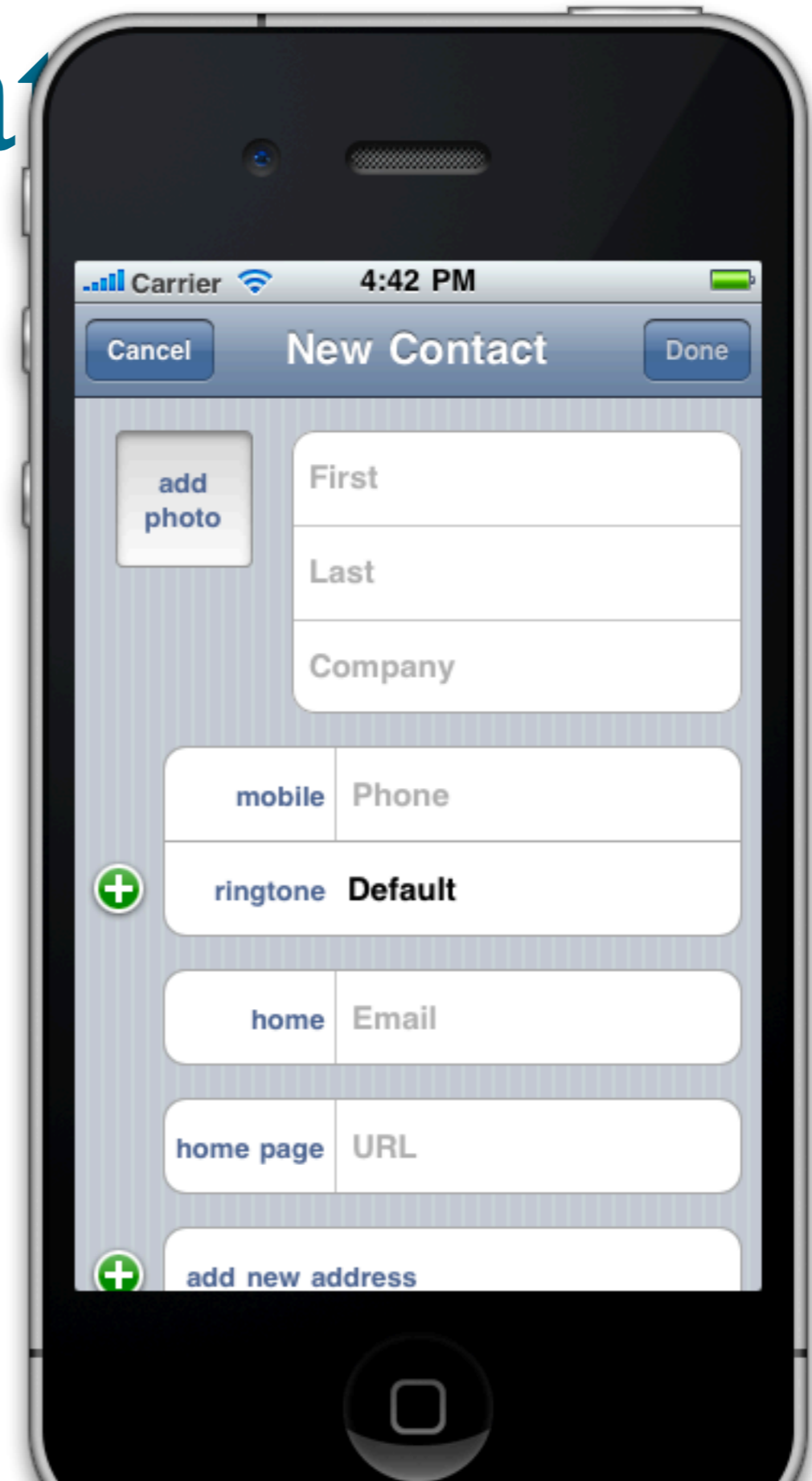
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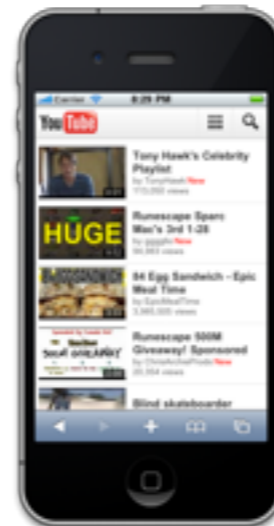
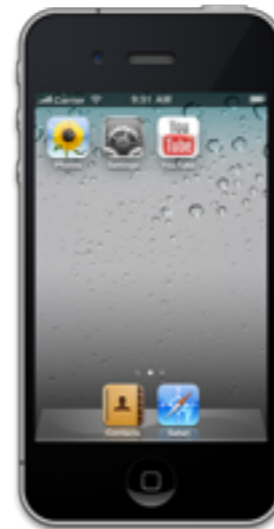
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IOS Apps Type

- Native Apps
- Web Apps



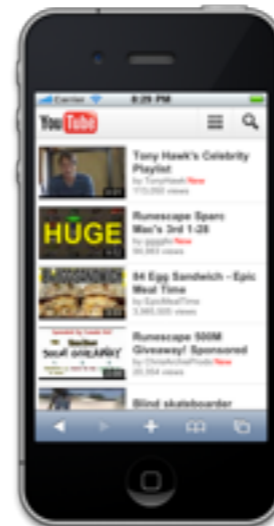
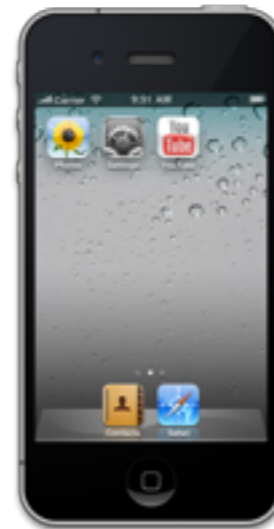
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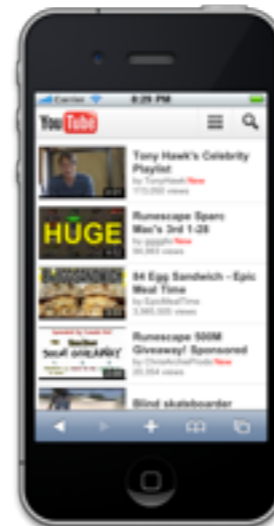
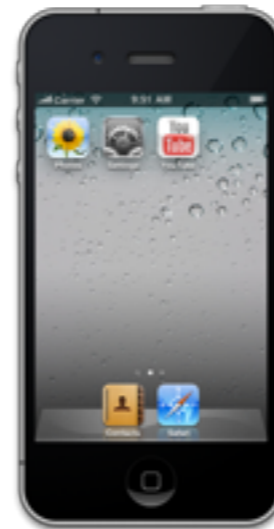
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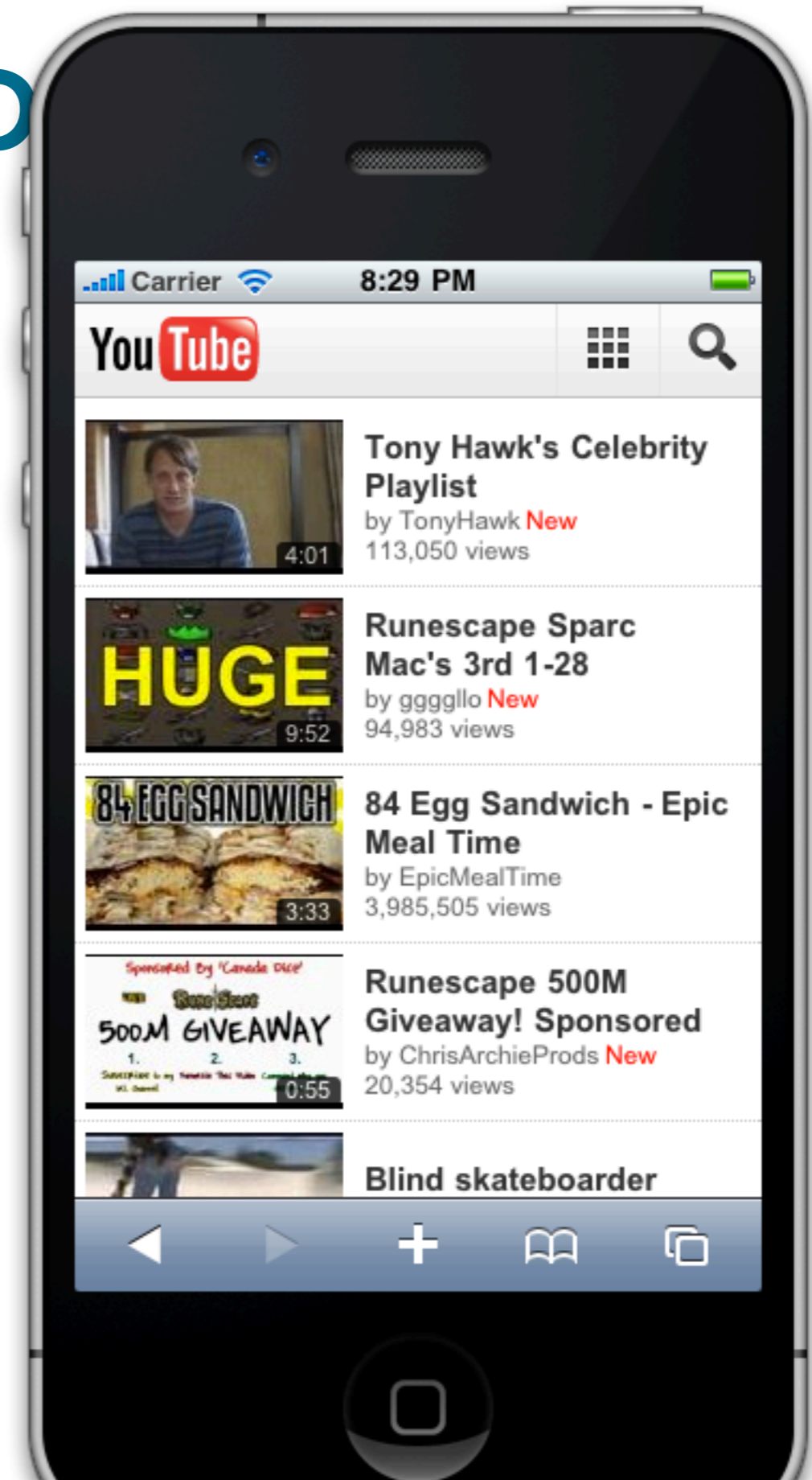
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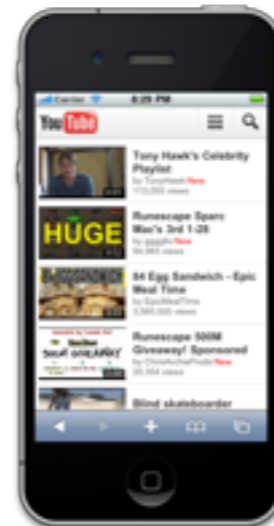
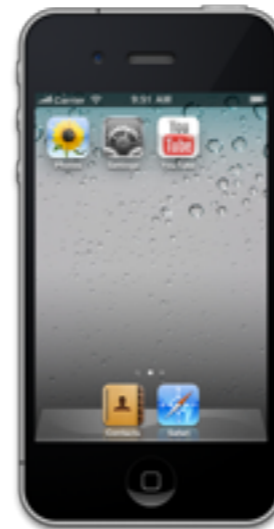
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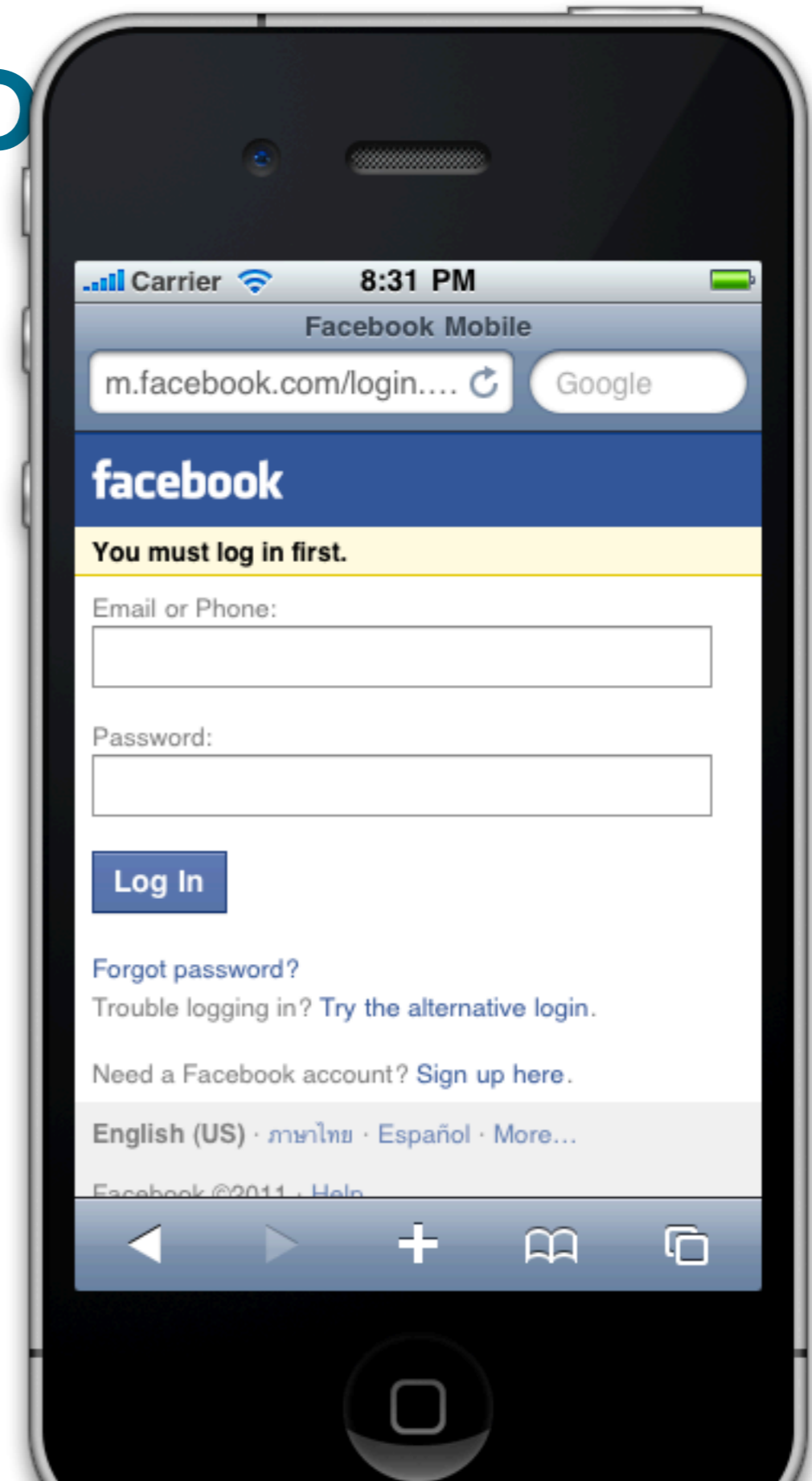
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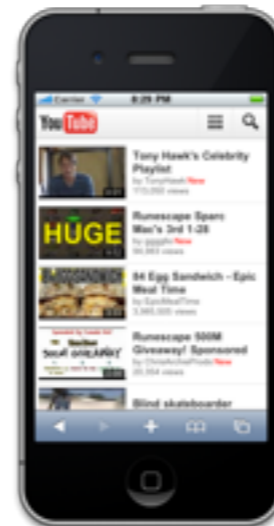
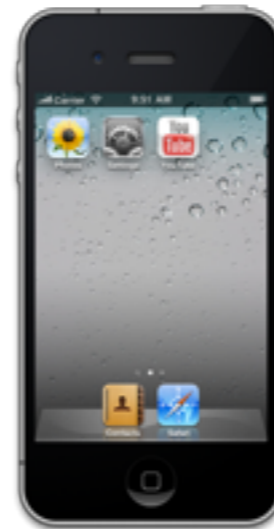
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IOS Apps Type

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HI Principles

- Aesthetic Integrity
- Consistency
- Direct Manipulation
- Feedback
- Metaphors
- User Control

Aesthetic Integrity

- Beautiful, neat
- Productive
- Follows Standard



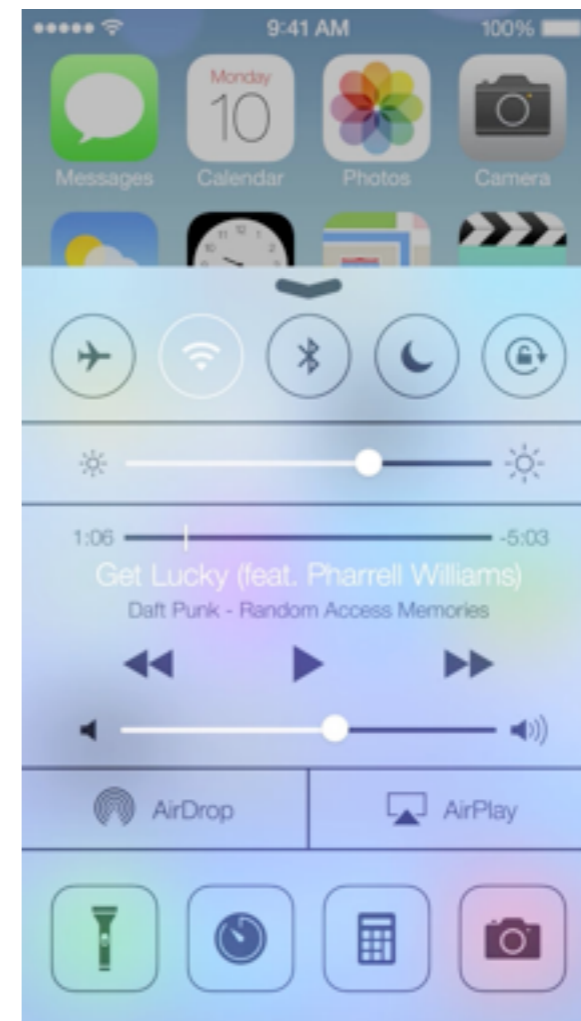
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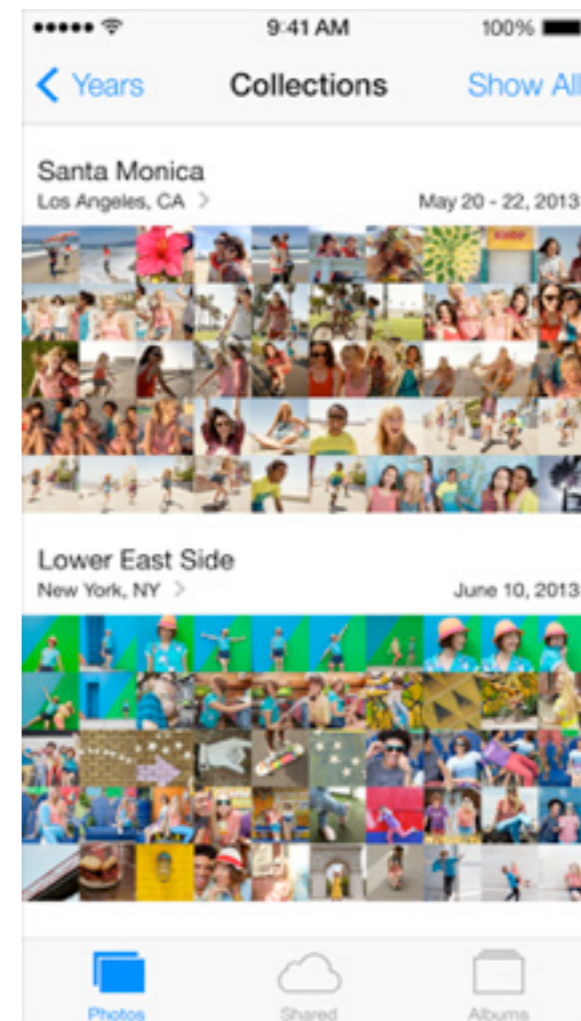
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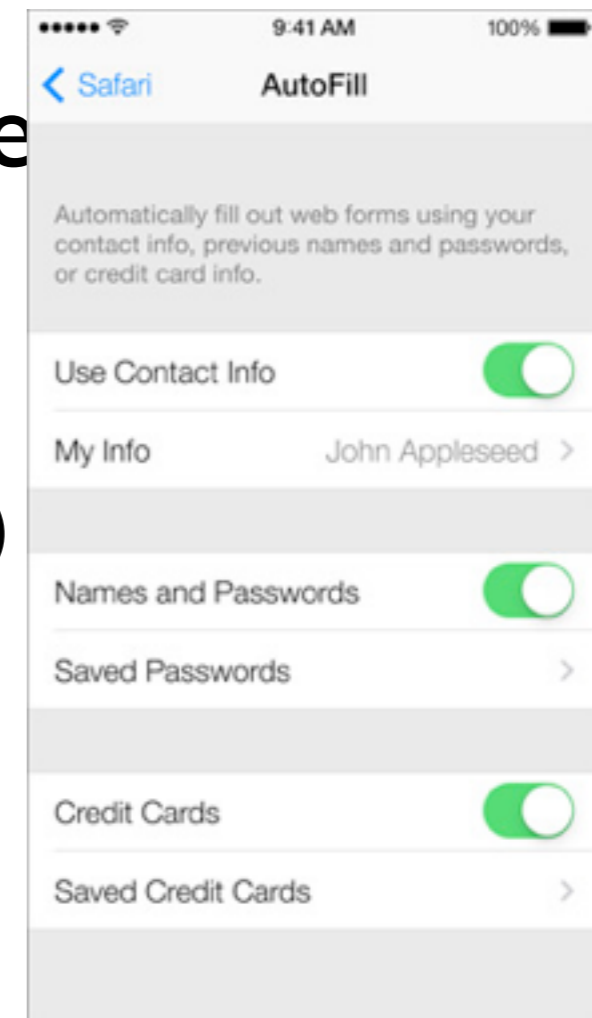
Consistency

- Standard = short learning curve
- UI & UX
- Color (iOS 7 precise color palette)
- Theme (iOS 7 simplicity)
- Font



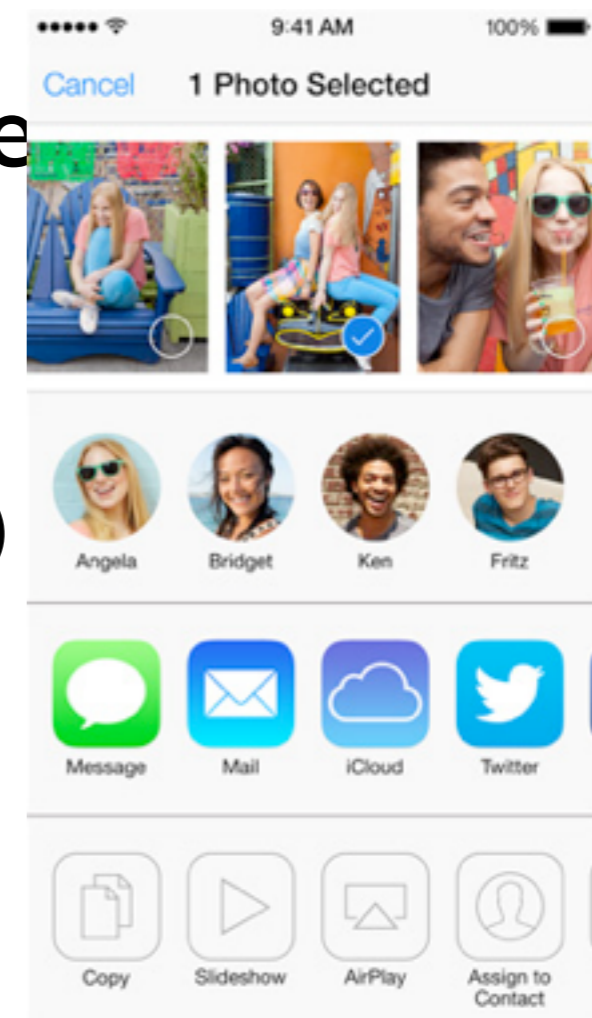
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Consistency

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- Font



Direct Manipulation

- Actions => Results
- Sense of control
 - touch object
 - gestures (pinches to zoom)
- Immediate results



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- Actions => Results
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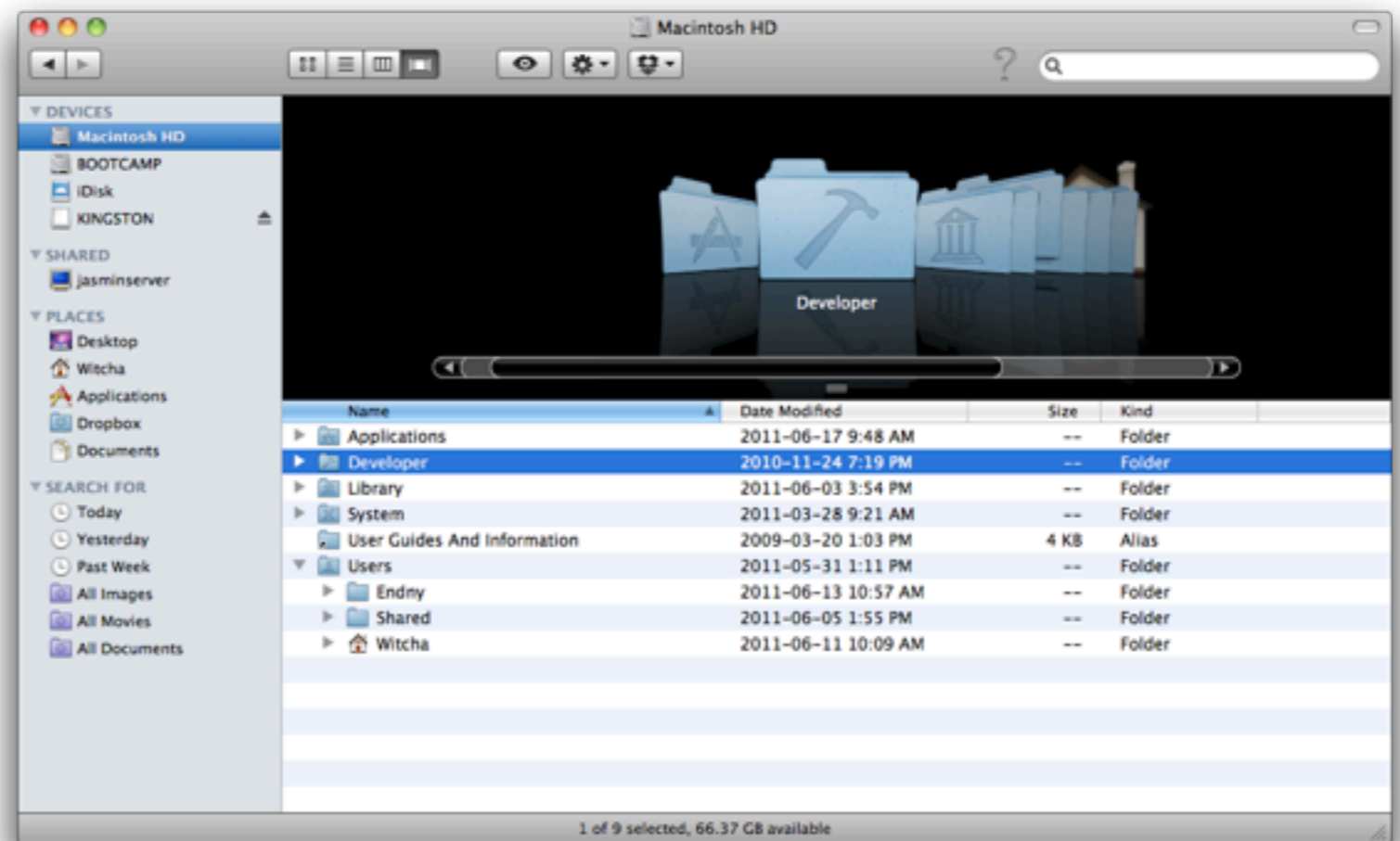


Feedback

- Immediate feedback
- Status
- Progress
- Animation
- Sound
- Vibration

Metaphors

- Virtual world \Leftrightarrow Real world
- Files & Folders
- Recycle Bin, Trash
- Telephone keypad



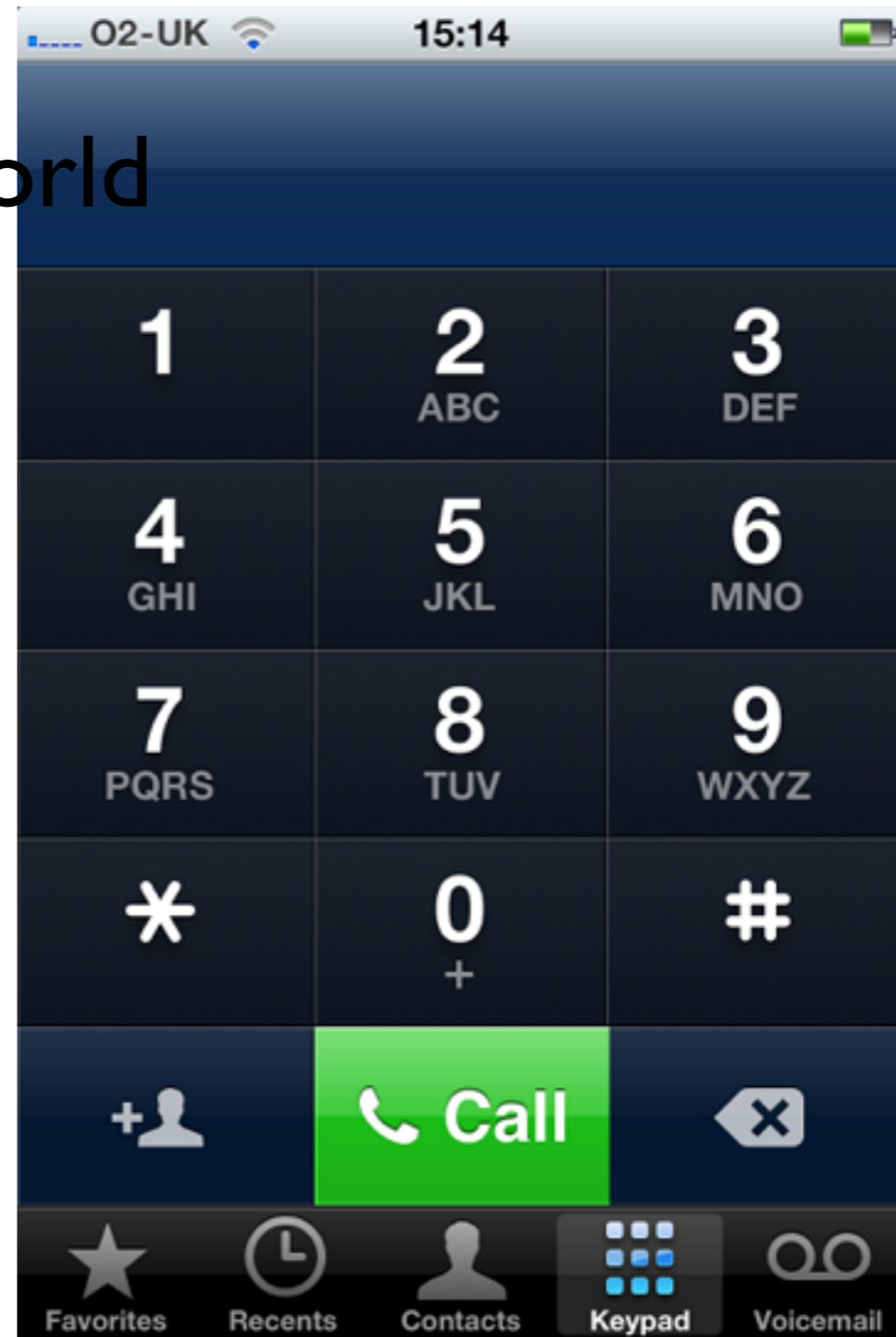
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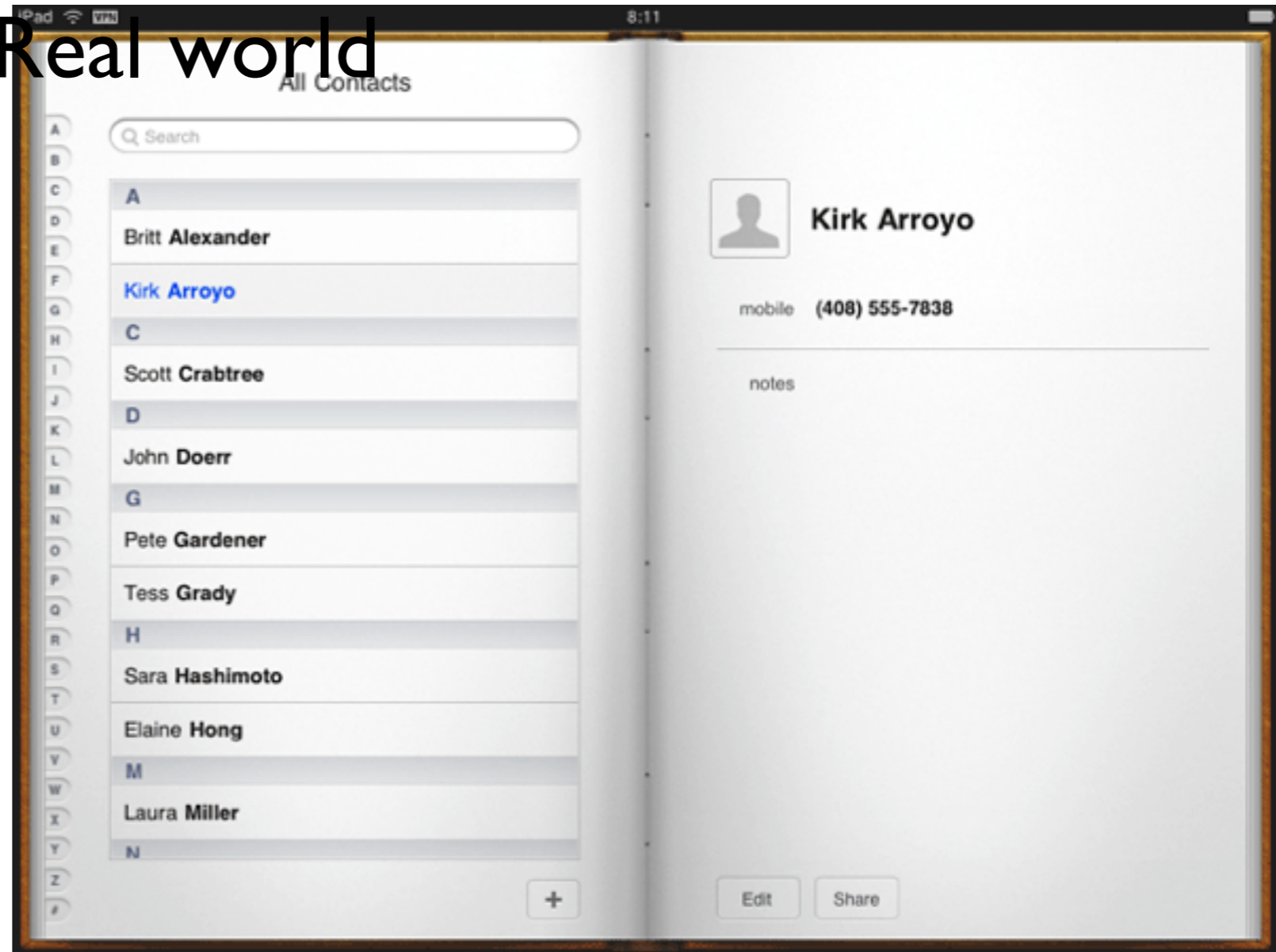
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Metaphors

- Virtual world \Leftrightarrow Real world
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User Control

- User initiate actions
- Empower
- Feels sense of control
- Warning / Avoid / Protect / Recover Errors
- Easy to understand / Predictable
- Confirm / Cancel Operation
- Confirm “Delete”

Design Principles

- Creates App's Definition
- Designs App for the device
- Customization
- Prototype

Create App's Definition

- Lists all features (wish list)
- Thinks out of box
- Knows your audience
- “Your App's Features”

Design App for the device

- Follows IOS UI
- Simple & Clear
- Universal Apps (iPhone iPad iPod)

Web-Based Design

- Expectation of IOS App
- User can do something
- Touch based / Scroll
- Should provide Web App icon

Customization

- Productive purposes
- Simple & Clear & Neat
- Reasonable
- Easy to Understand

Prototype

- Tests App ideas
- Validates App's functionality & user experience
- Uncovers something (features or bugs)

Case Study: IOS Apps



[Download](#)

<http://developer.apple.com/library/ios/#documentation/userexperience/conceptual/mobilehig/Introduction/Introduction.html>
<http://developer.apple.com/library/ios/navigation/>