

# MOBILE INPUT



LUKE WROBLEWSKI

UX IMMERSION

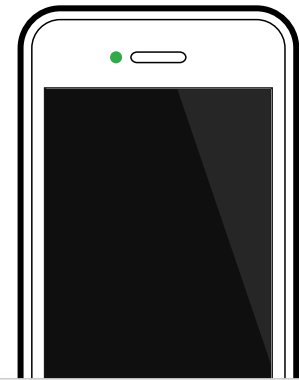
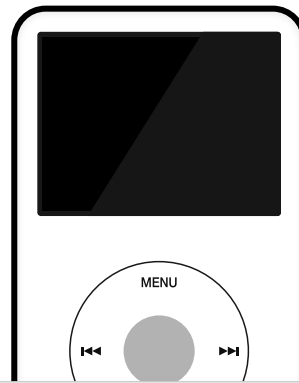
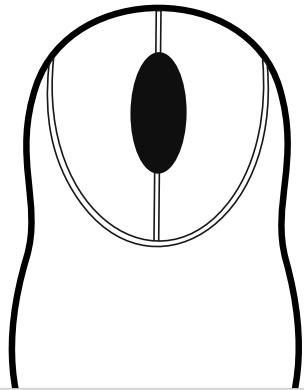
# WHY INPUT?

---



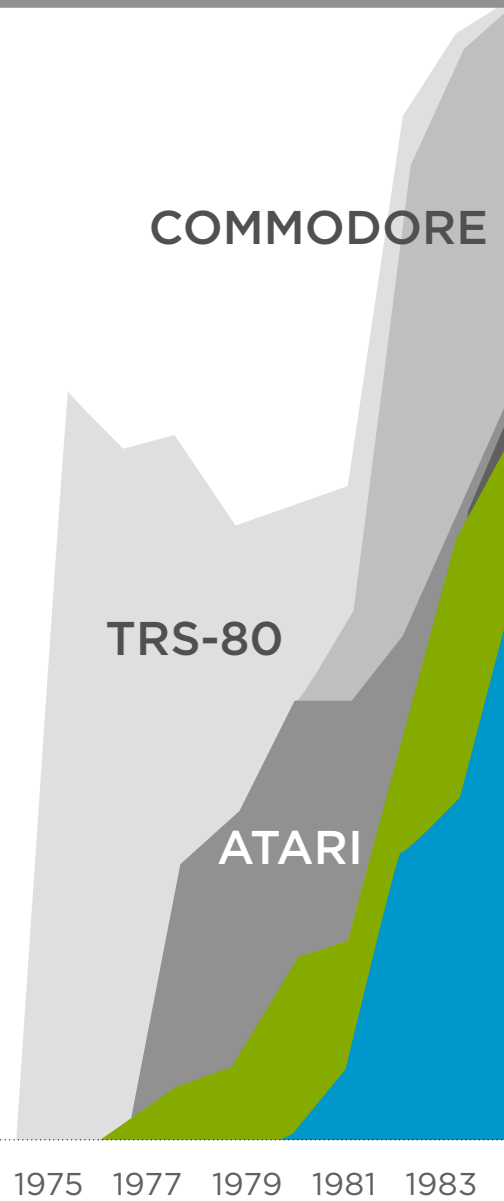
# NEW INPUT METHODS

---



“Each new input method led to not just a disruption but new platforms and new business models.”

# Share of Personal Computing



Source: <http://bit.ly/xDzag2>

# Mobile Phone Profits

Q2/2007    Q1/2008



Source: <http://bit.ly/udBlqO>

# WHY MOBILE?

---



The rule of thumb is to limit the use of forms in the mobile context.

Mobile Web Design & Development, O'Reilly 2009

---

Filling out forms for web based services on mobile devices is a very time consuming and frustrating task for users.

ACM Pervasive and Mobile Computing, 2008

---

In general, using input elements is difficult for users. Avoid text input where possible.

Sprint Web Style Guide, 2005

# SMS Messaging

---

**4.1 B**

text messages sent per day in US in 2009

**73%**

of US mobile phone use SMS messaging

**92%**

of smartphone users sent SMS message



**109.5**

average number of messages/day (18-24 US)

**41.5**

average number of messages/day (adults US)





During a typical day...

84% at home

80% during misc. times throughout the day

74% waiting in lines

64% at work

Flickr photo by Laughing Squid

# Input Matters

- **12M** users in 12 months
- **30M** users in 16 months
- **1M** users in 12 hours
- **1B** acquisition by Facebook





# Input Matters

- **1M** downloads in 9 days
- **35M** downloads in 6 weeks
- **50M** downloads in 50 days
- **210M** acquisition by Zynga



# EMBRACE INPUT

---

- Despite challenges, people use mobile for input
- Anywhere, anytime inspiration strikes
- Encourage, don't limit input

# YOUR TURN

---

What one question do you most want answered today?

and what phone do you carry?

# Questions to Answer

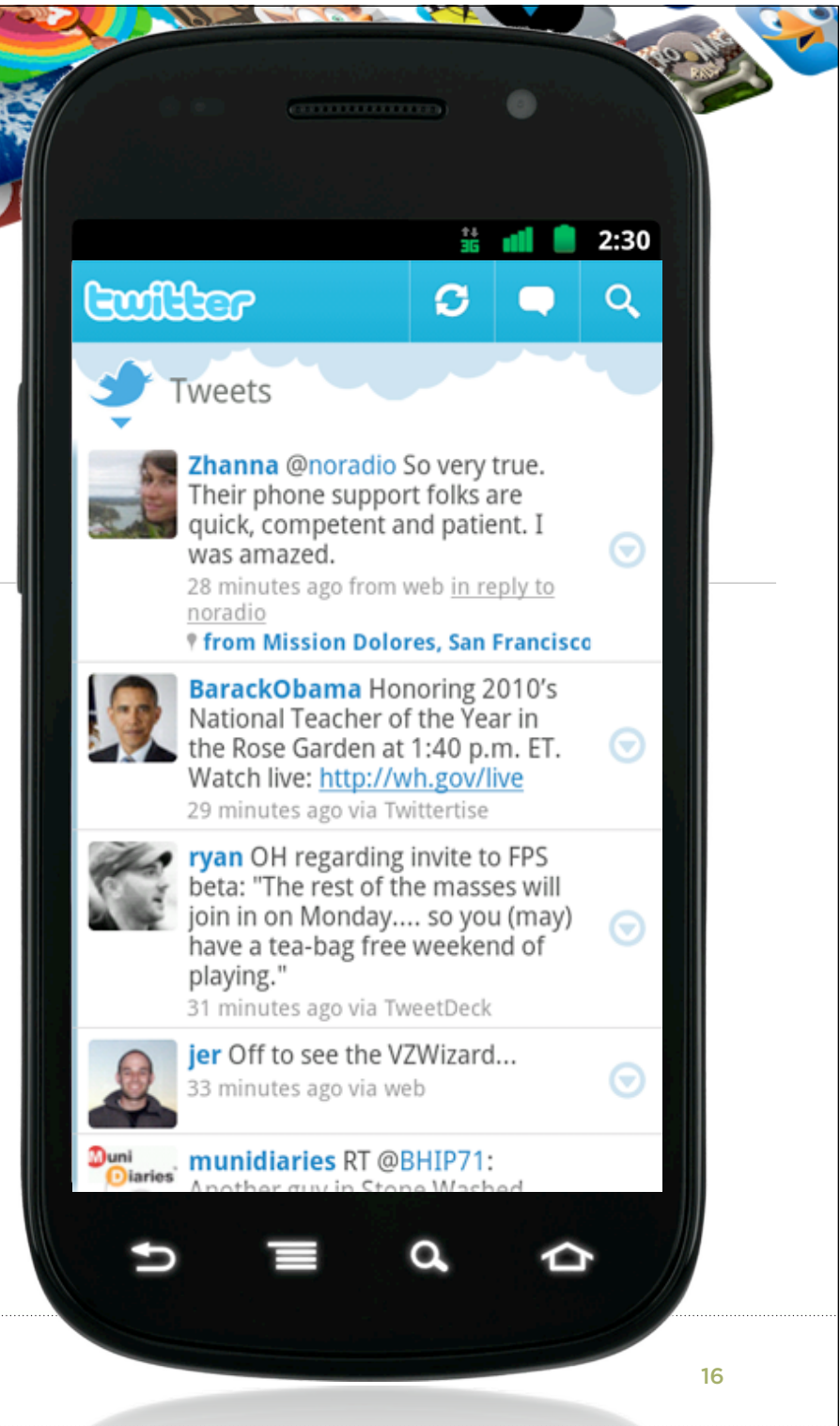
---

1. Add...

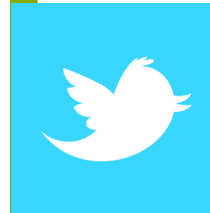
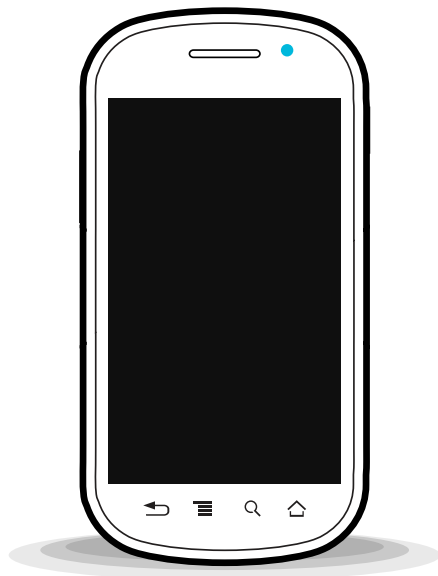
# NATIVE & WEB

# SMARTPHONES

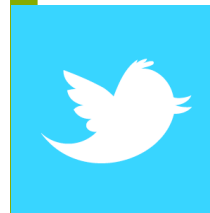
Don't most people just use native mobile applications to access the Internet?



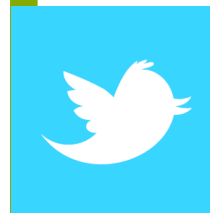
# TWITTER



**55%** of users on mobile

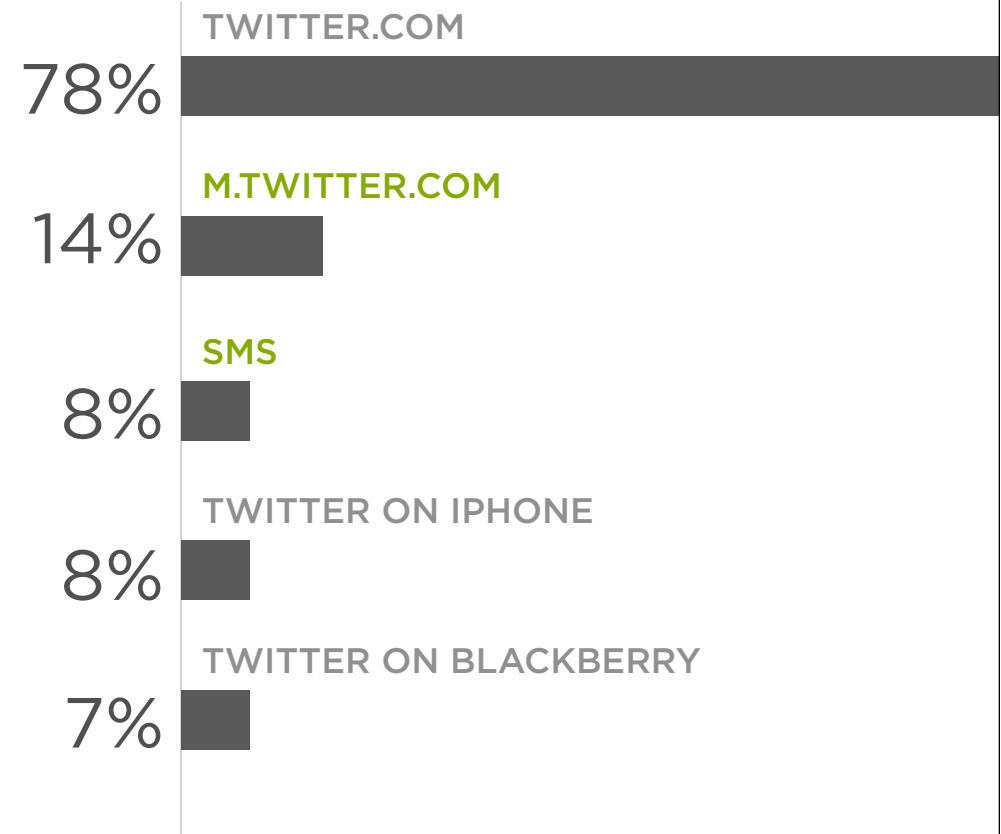
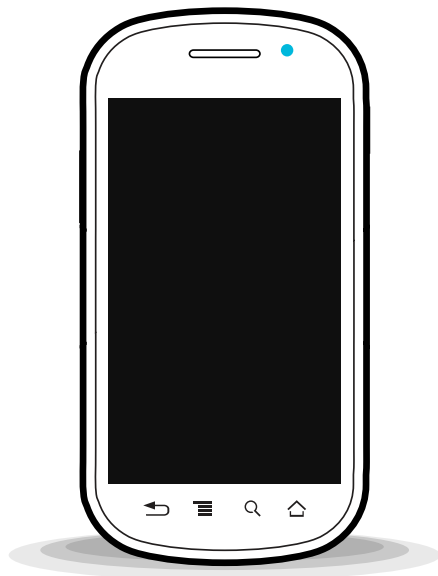


**40%** of tweets from mobile

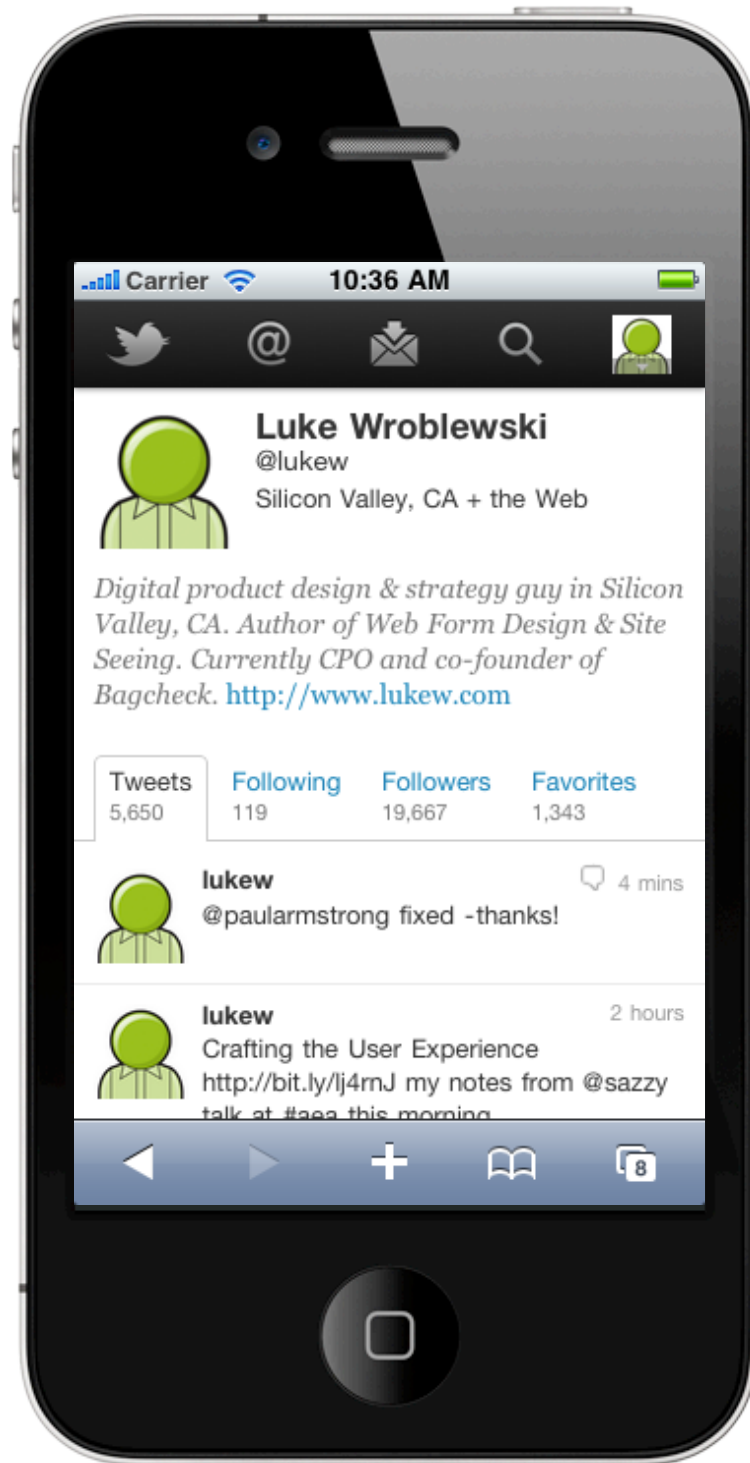
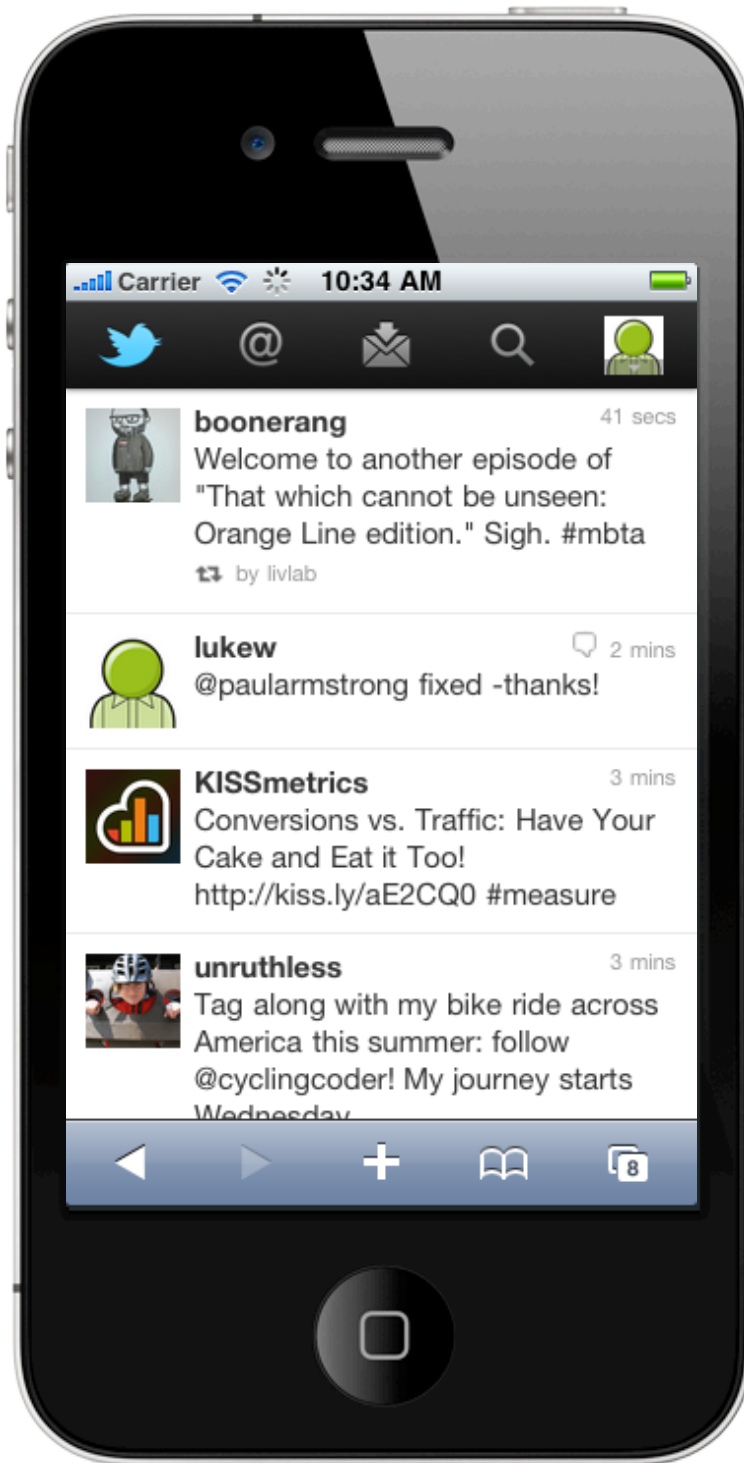


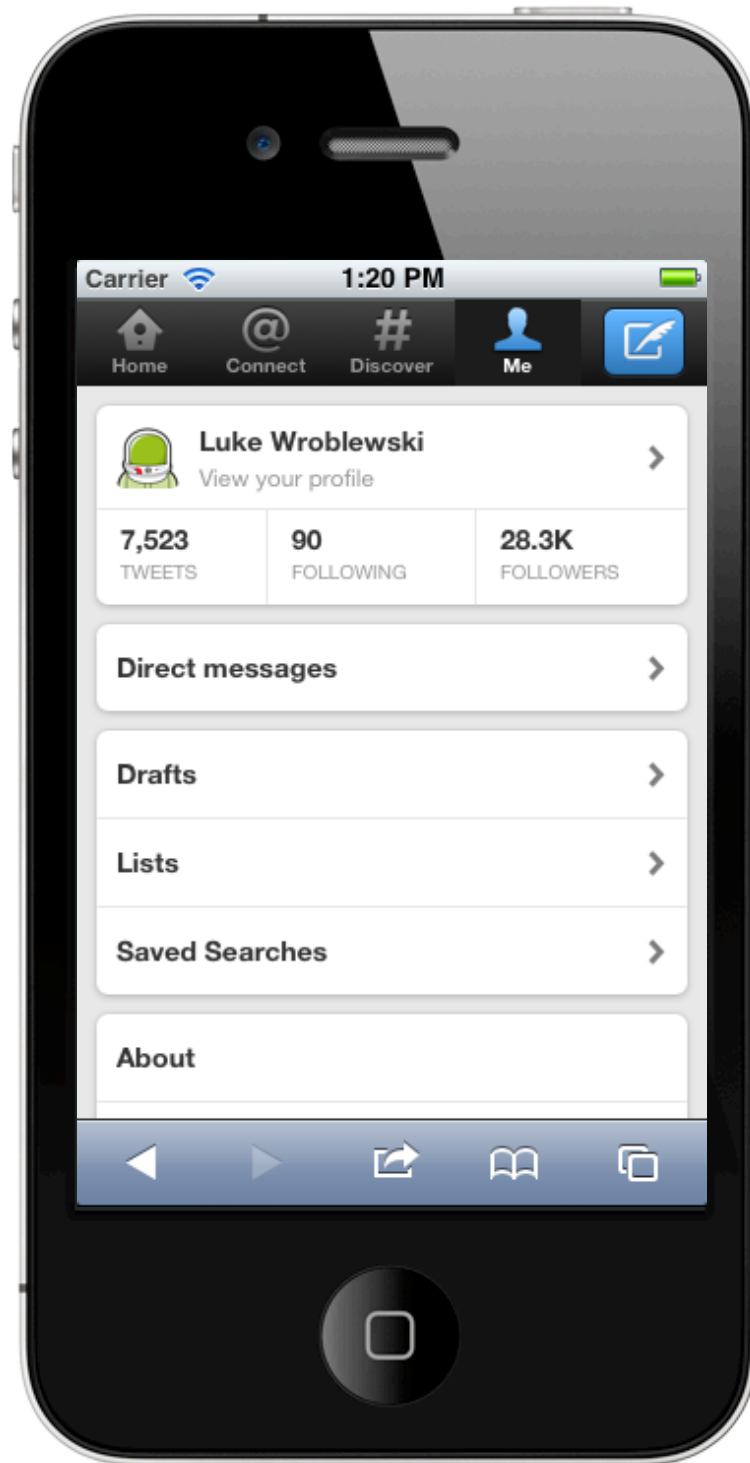
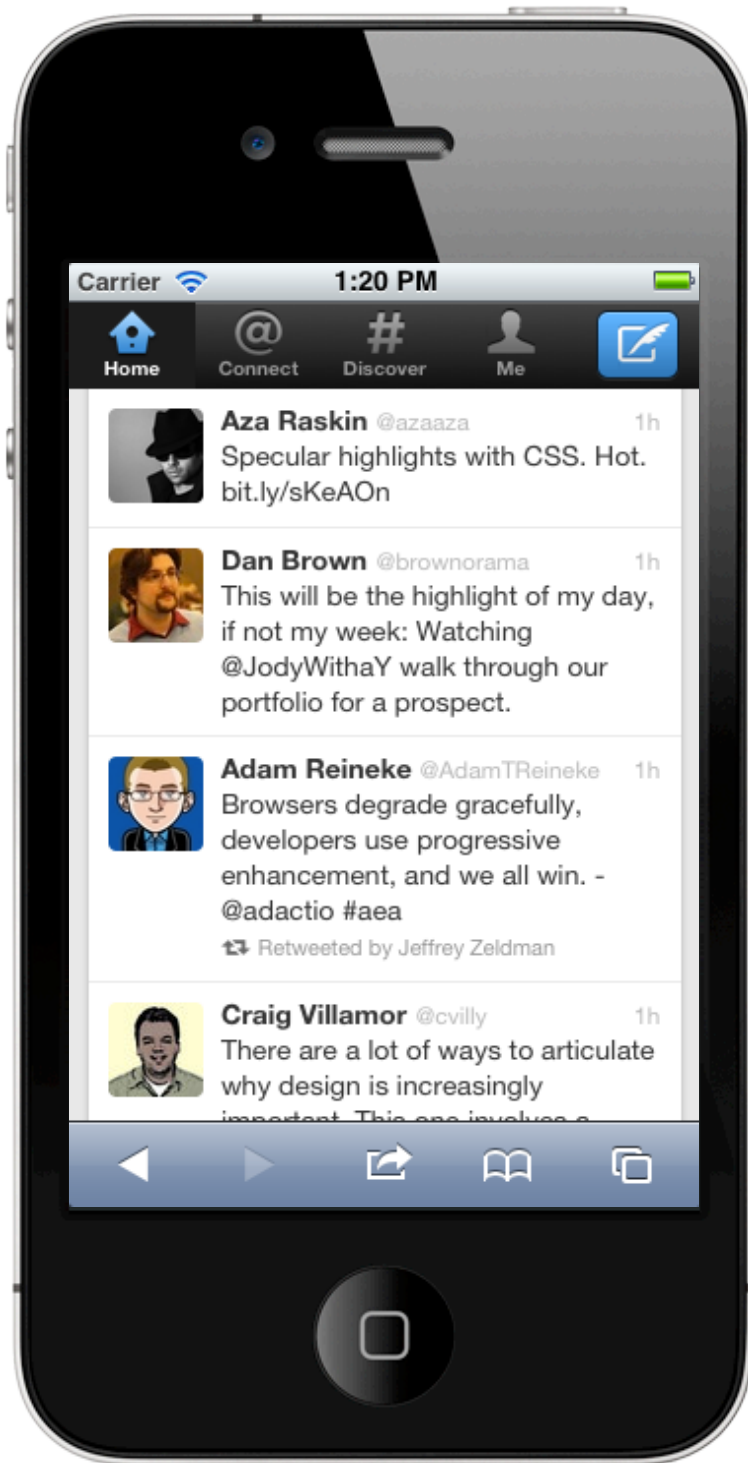
**16%** of new users start on mobile

# TWITTER

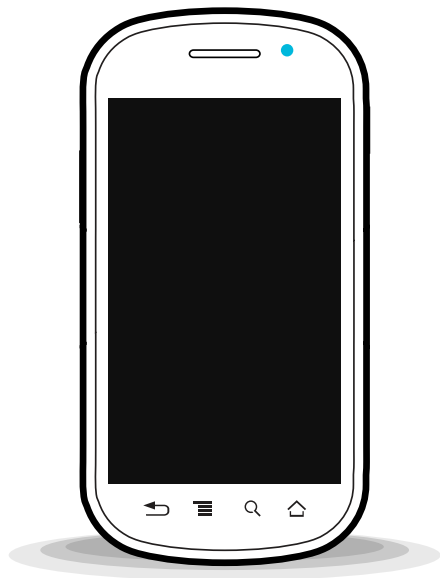








# FACEBOOK



**50%** of users on mobile



**50%** of mobile web traffic



**2X** more desktop use if also use mobile

# Facebook Usage

---

**425 MILLION**

“We see more people accessing Facebook on the mobile web than from our top native apps combined”

Palm

Android

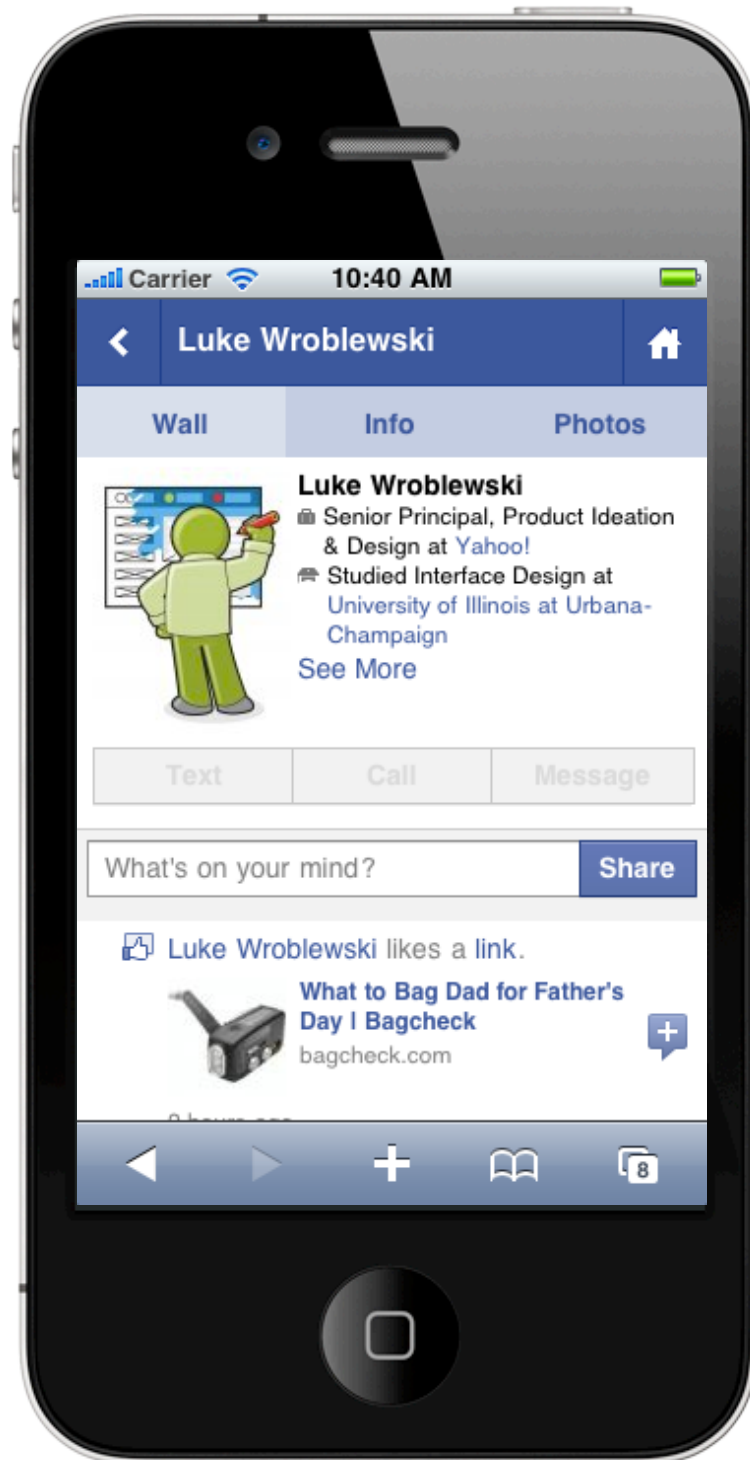
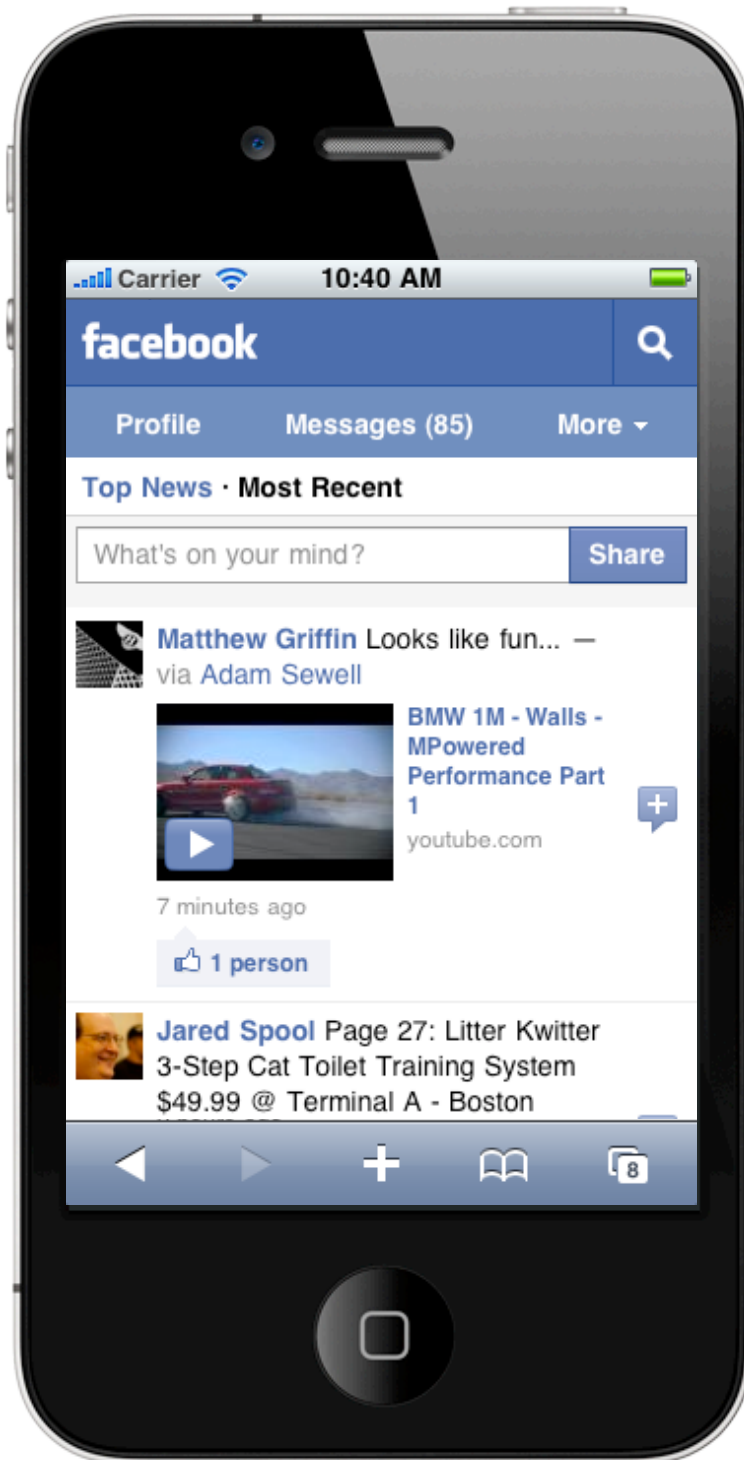
Sony Ericsson

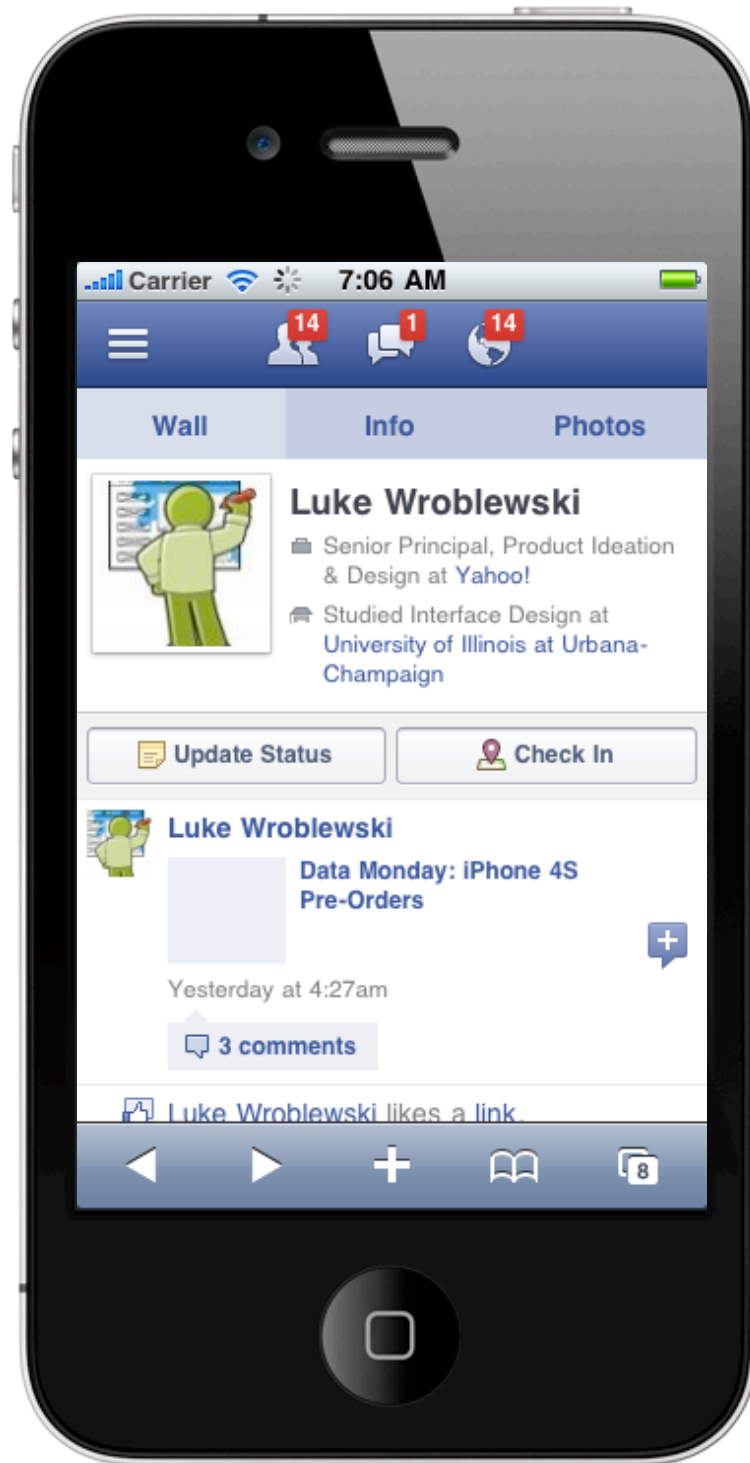
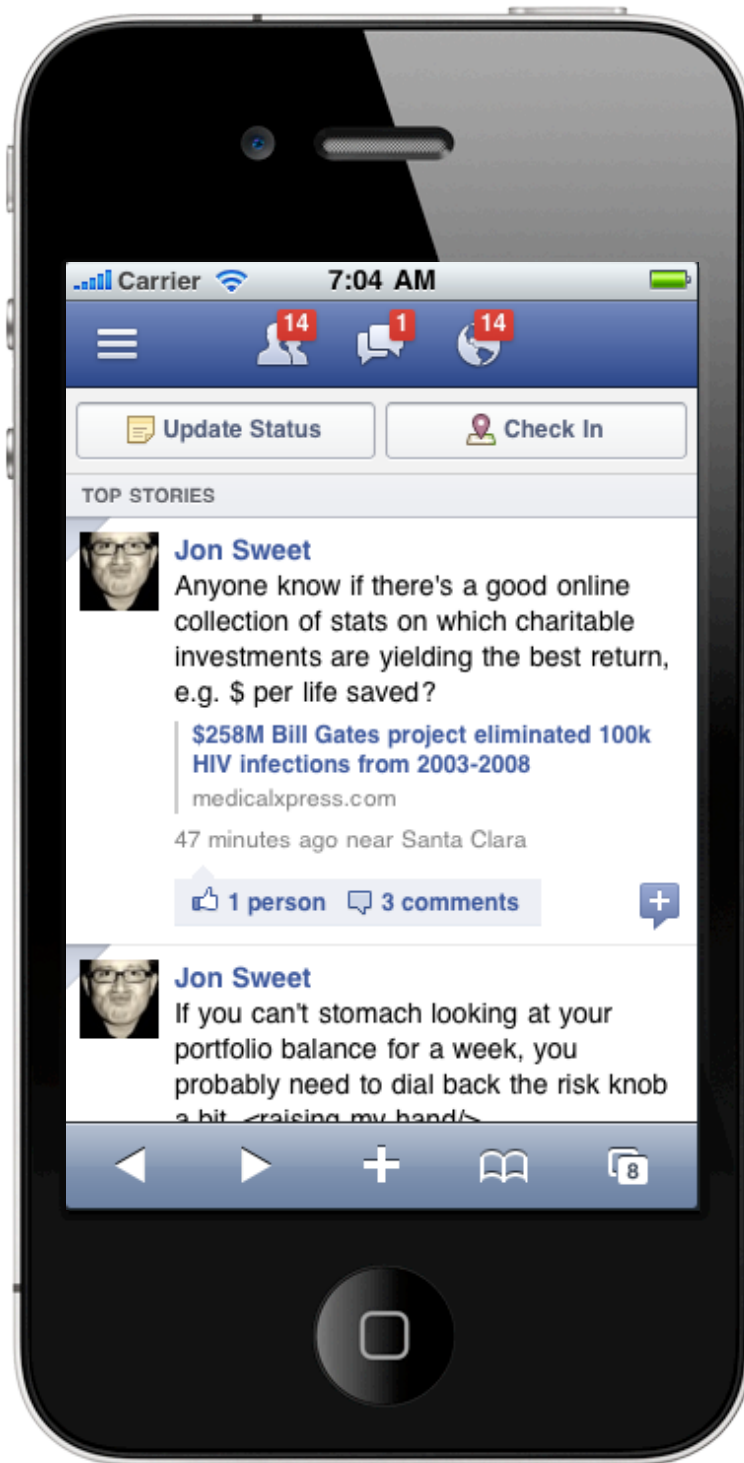
Windows Phone

INQ

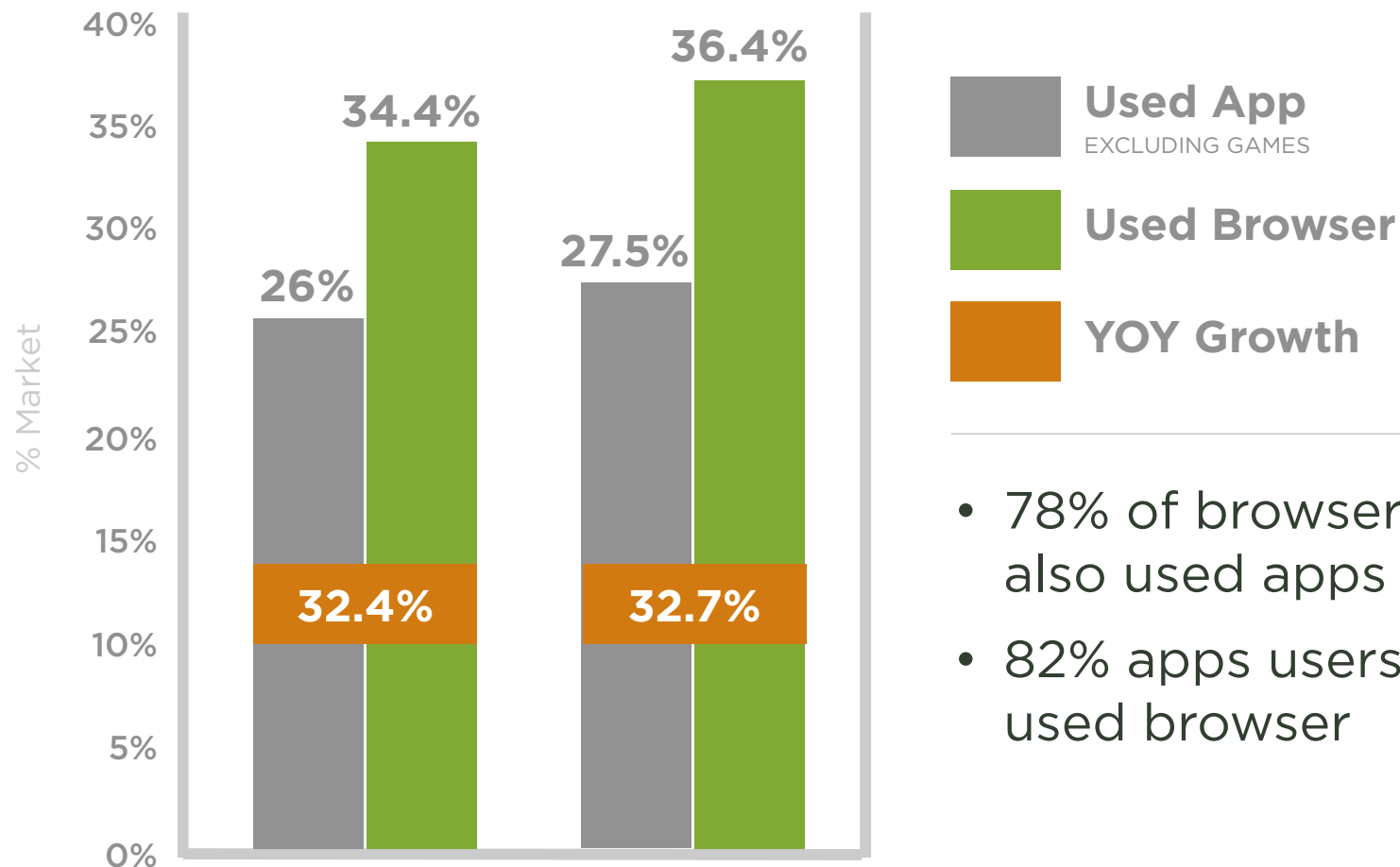
Sidekick

Blackberry



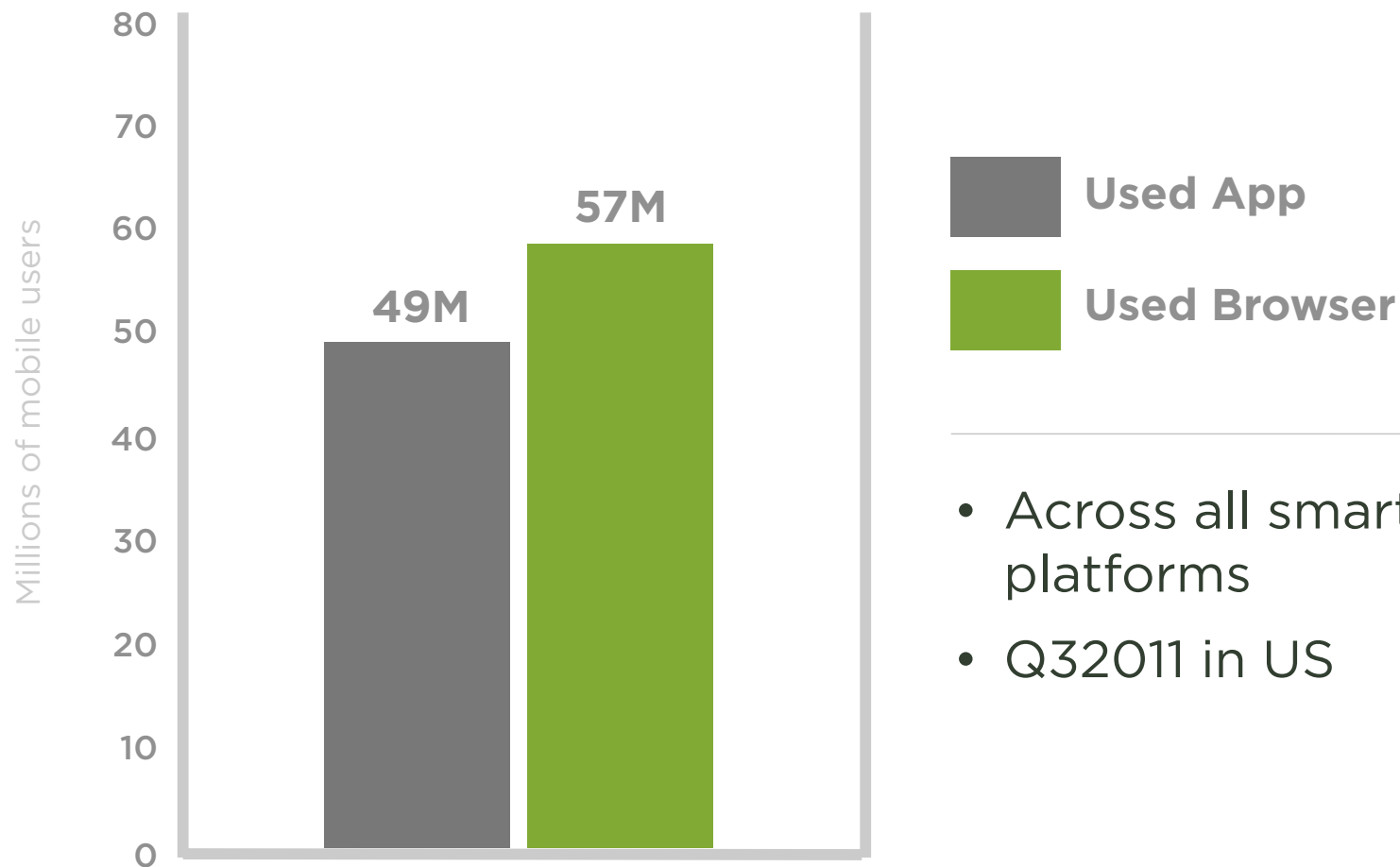


# Browser & App Usage



- 78% of browser users also used apps
- 82% apps users also used browser

# Browser & App Usage



- Across all smartphone platforms
- Q32011 in US



# Native App

---



- Deeper hardware access
- Multi-tasking (background)
- App & in-app sales
- Integrated placement: app stores & home screens

# Native Mobile Applications

**68%**

of adults with apps on their phones  
reported actually using them

**31%**

use more than 6 different apps a week

**38%**

iOS & Android users stick with an app after one month

**14%**

iOS & Android users stick with an app after six months



# Native Mobile Applications

**26%**

of all apps downloaded are opened only once and then never used again

**26%**

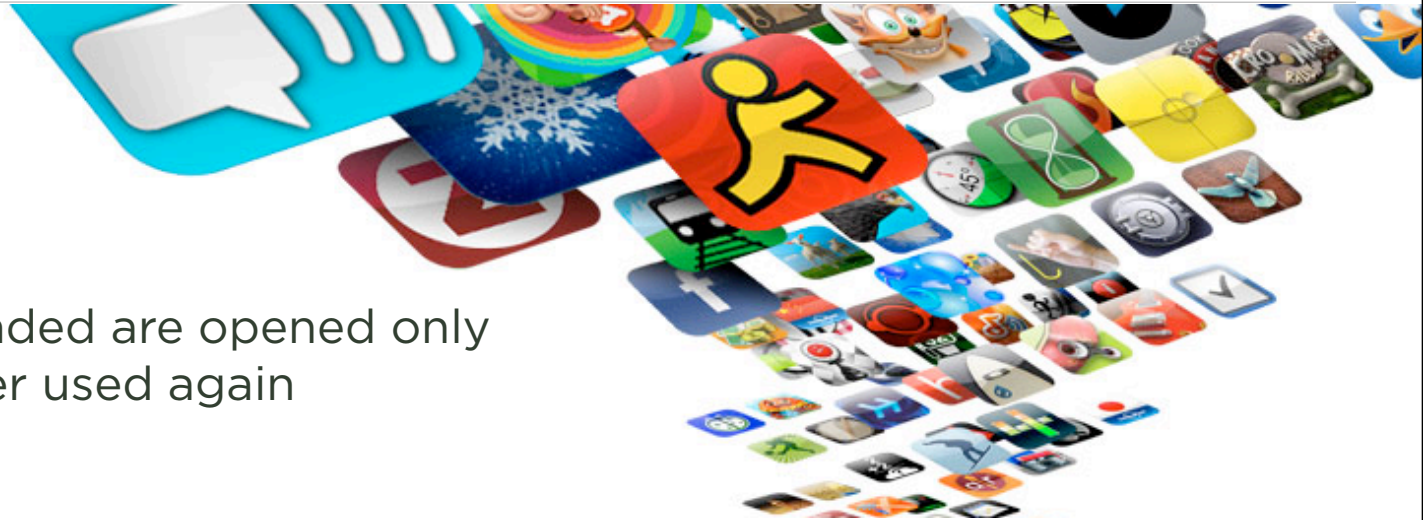
of mobile apps are used 11 times or more

**2.5**

new apps added by average smartphone user per month

**80,000**

downloads required to make it into iOS top app charts



# Native Application Strategies

From Suzanne Ginsburg

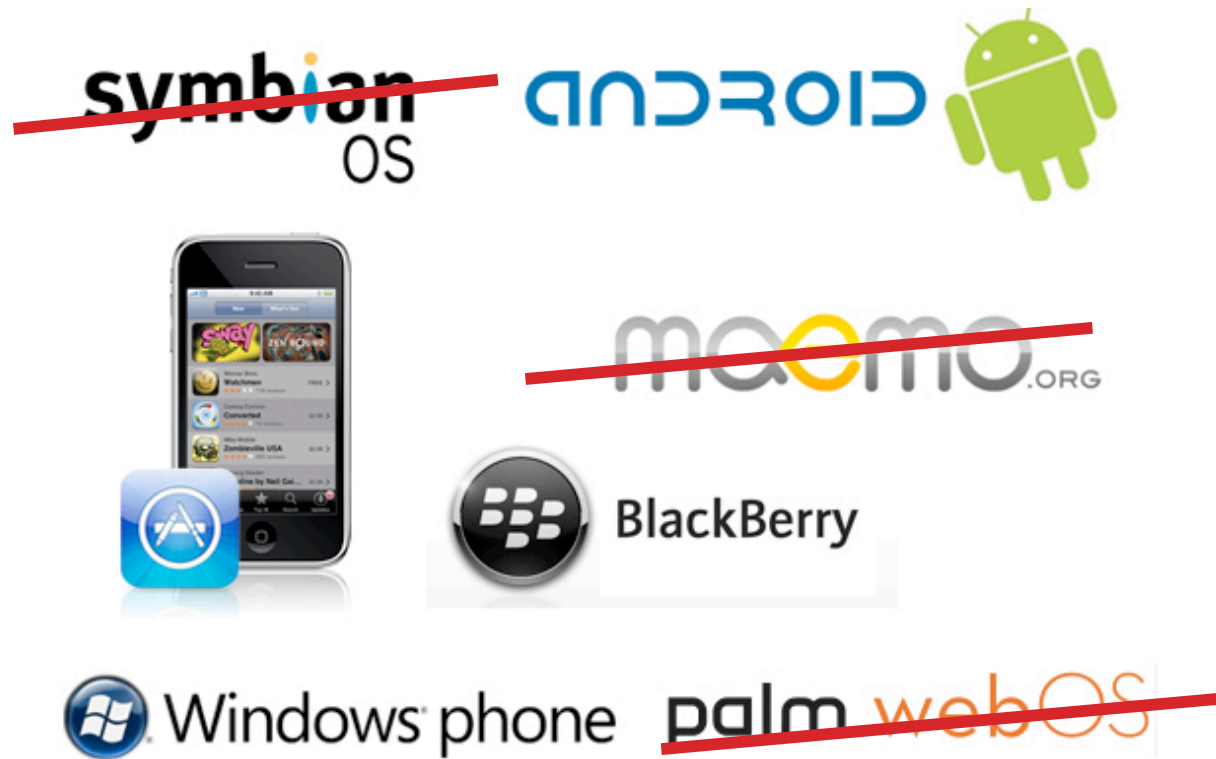


An icon by Hide Itoh (1200% enlargement)

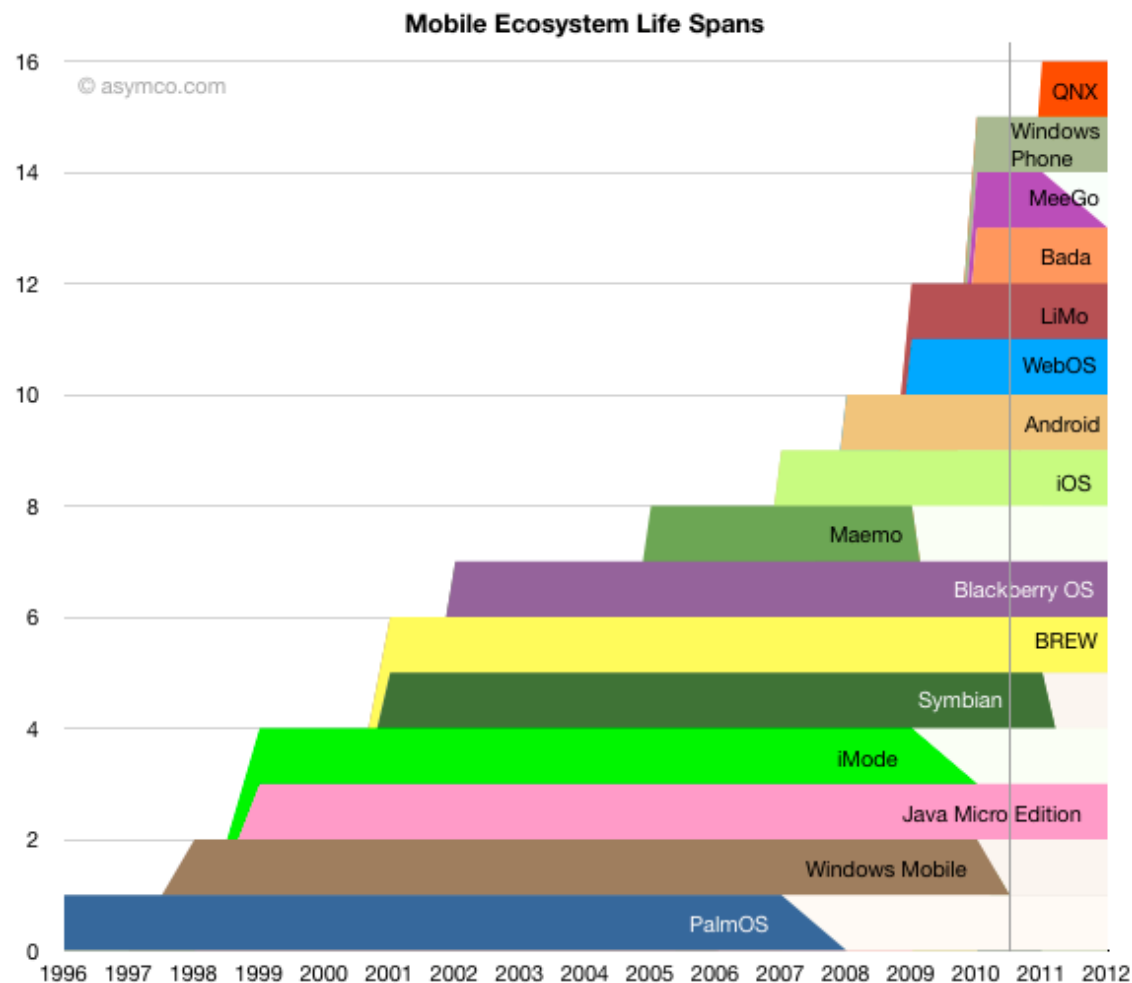
- **One trick pony**  
Build for one native platform if your user base is mostly on that platform or your must-have features are only on that platform
- **OK Corral**  
Design your app for 2-3 flagship platforms. Use this approach if your users are on a few platforms and you want the best experience possible on each.
- **Trojan Horse**  
Create Web apps with native app capabilities by wrapping Web apps within native application code.

# Native Application Platforms

---



# Native Application Platforms



# Native Application Platforms

---

Gowalla



Apple iPhone



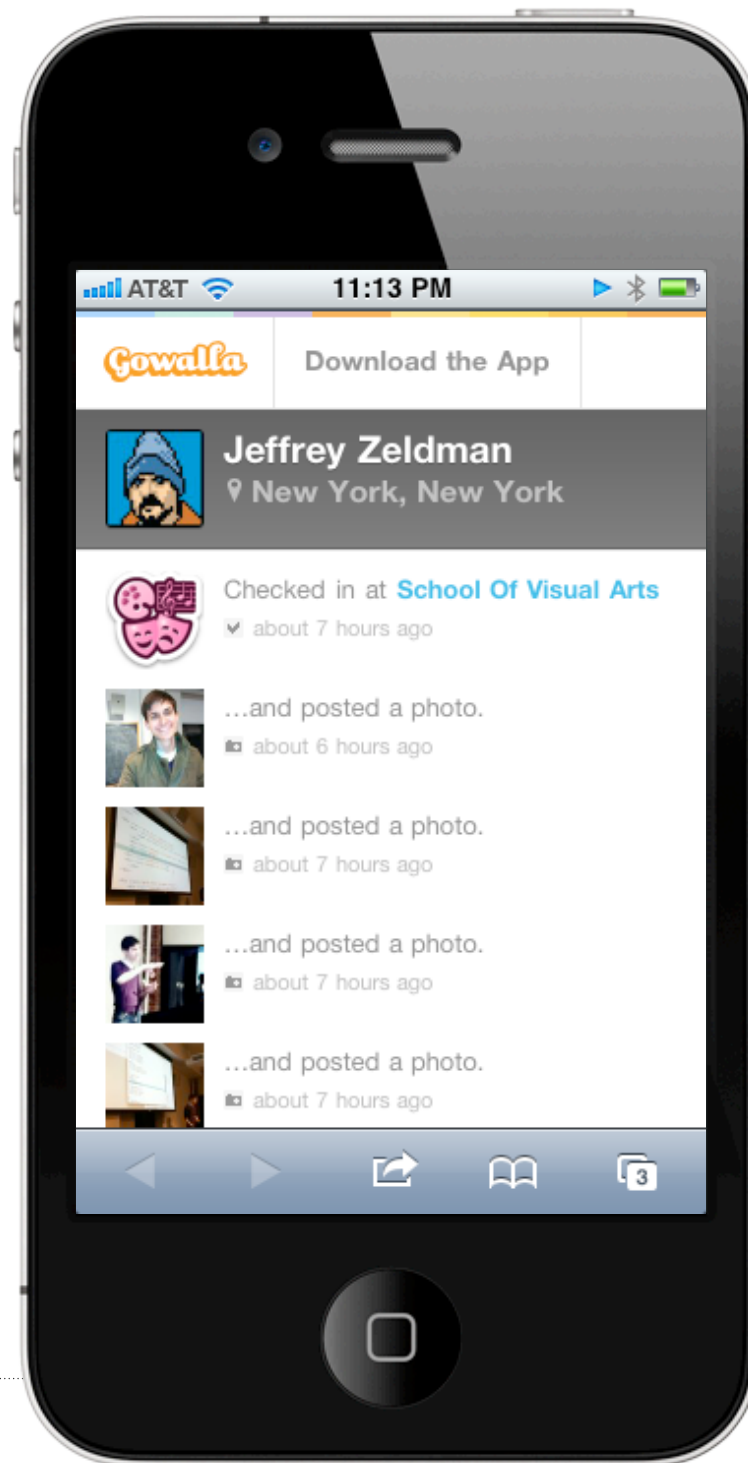
ANDROID



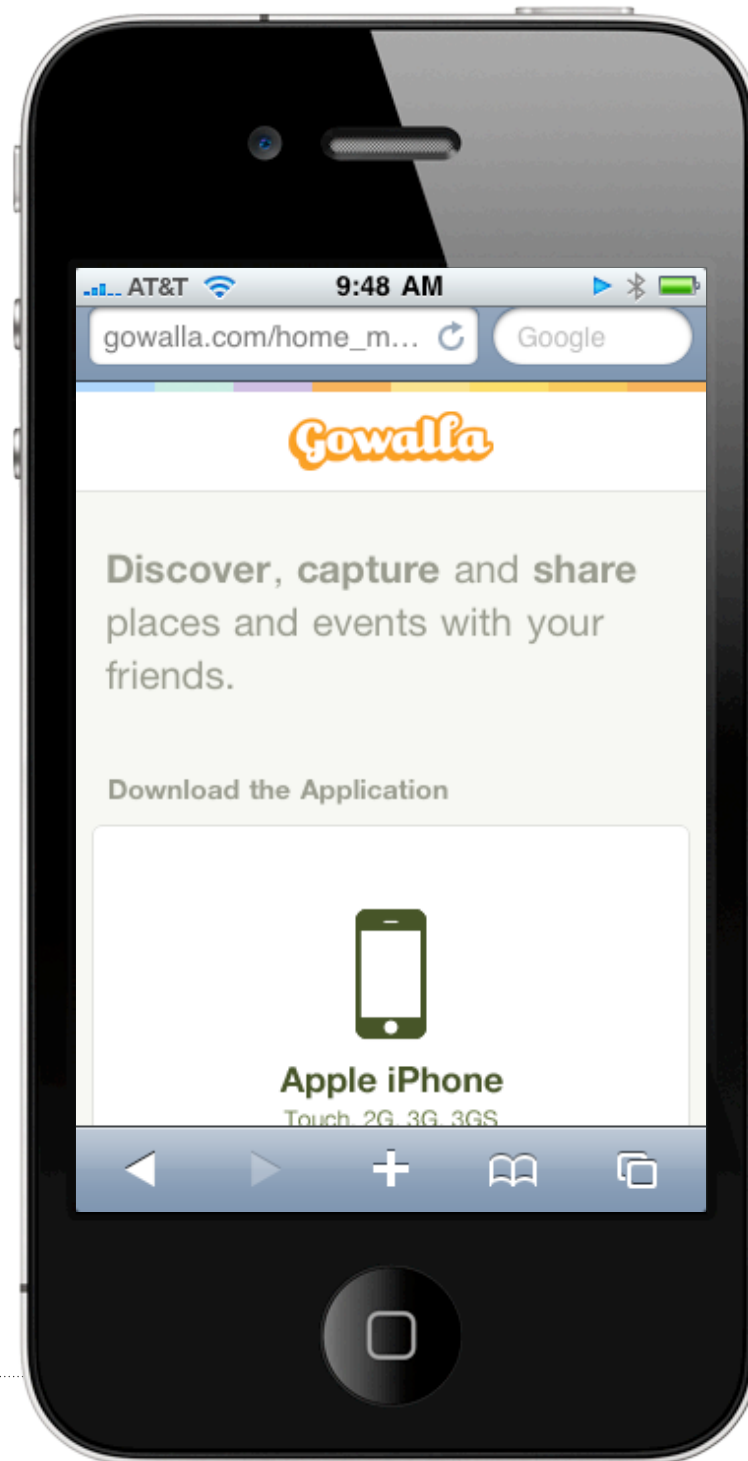
BlackBerry



iPad







# Mobile Strategy

---



**@jamespearce**










James Pearce

2008: "We must have an iPhone app"  
2010: "We must have an Android app"  
2011: "We must have a... whoa: wait a minute"

7 hours ago via Nambu ☆ Favorite ↺ Undo Retweet ↻ Reply

# YouTube Mobile Strategy

**400M views/day**    **15% of daily views**  
on YouTube mobile (up 3x year)

Access Choice	Android	Blackberry	iPhone	Nokia S60	Windows	Others
Pre-installed YouTube application						
Download from m.youtube.com/app						
Web-based version on m.youtube.com						

# Mobile Strategy

Platform	Android	Blackberry	iPhone	Nokia S60	Windows	Others
Native Application	✓		✓			
Take advantage of capabilities						
Web-based version	✓	✓	✓	✓	✓	✓
Access across all platforms						

# Mobile Strategy

Platform	Android	Blackberry	iPhone	Nokia S60	Windows	Others
Native Application	✓		✓			
Take advantage of capabilities						
Web-based version	✓	✓	✓	✓	✓	✓
Access across all platforms						

# Mobile Strategy

Of course you need to know what your **core value** is!

Make core value faster or easier

1. technology
2. home screen access
3. payments
4. high-value customers

Integrate non-core content & actions

## Platform

Android

Blackberry

iPhone

Native Application



Take advantage of **capabilities**

Web-based version

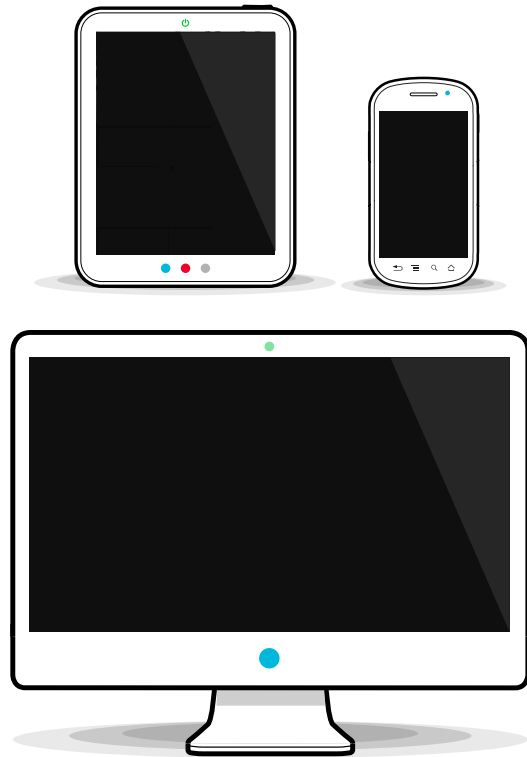


**Access** across all platforms

# THINK CROSS CHANNEL

“All channels should support each other:  
SMS grows apps, Web grows mobile, stores  
grow SMS.” -Walgreens

# CROSS CHANNEL



*Walgreens*

2M SMS opt-ins

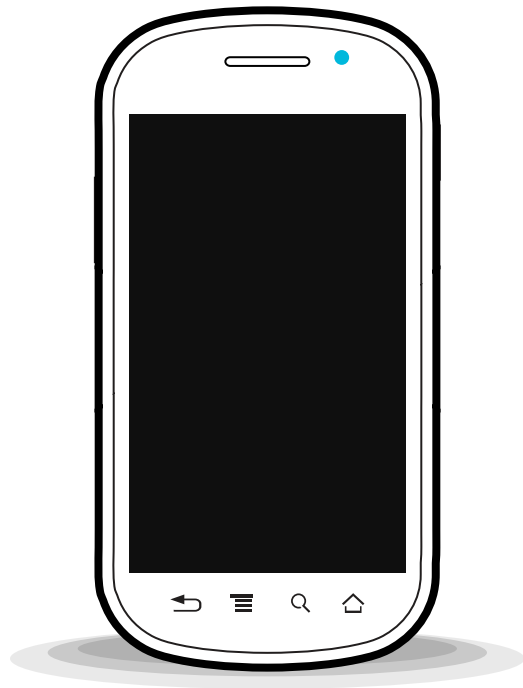
18% SMS opt-in rates

40% of online RX from mobile scanning

50% of Web visitors go to store next

3X more value from cross channel user





## SOFTWARE

1. Constraints
2. Input fields, types, masks...
3. Mobile forms

## HARDWARE

1. Capabilities
2. Rethinking forms



Coffee Mug



Big Screen



Power Supply



Consistent Network



Keyboard



Mouse



Chair



Desk



# INTENSELY PERSONAL



Small Screen



Battery



Fingers



Sensors

**1024x768**



**AT&T**





ONE EYEBALL

Partial attention requires focused design

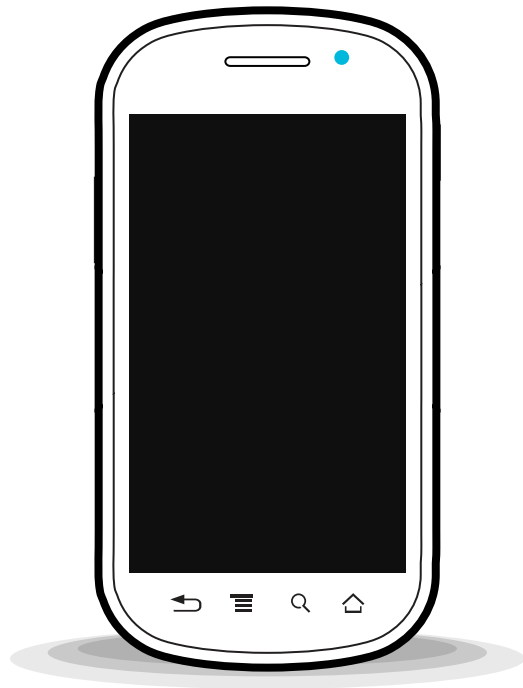
ONE THUMB

PHOTO BY STEVE RHODES

# CONSTRAINTS

---

- Are good for design & business
- Screen size: severely limited space
- Speed: performance matters
- Usage: used anywhere & anytime



## SOFTWARE

1. Constraints
2. Input fields, types, & more
3. Mobile forms

## HARDWARE

1. Capabilities
2. Rethinking forms



Input Type	HTML
checkbox	<code>&lt;input type="checkbox"&gt;</code>
radio button	<code>&lt;input type="radio"&gt;</code>
password field	<code>&lt;input type="password"&gt;</code>
drop-down lists	<code>&lt;select&gt;&lt;option&gt;...</code>
file picker	<code>&lt;input type="file"&gt;</code>
submit button	<code>&lt;input type="submit"&gt;</code>
plain text	<code>&lt;input type="text"&gt;</code>

# select on iPhone

Device Optimized  
UI Control

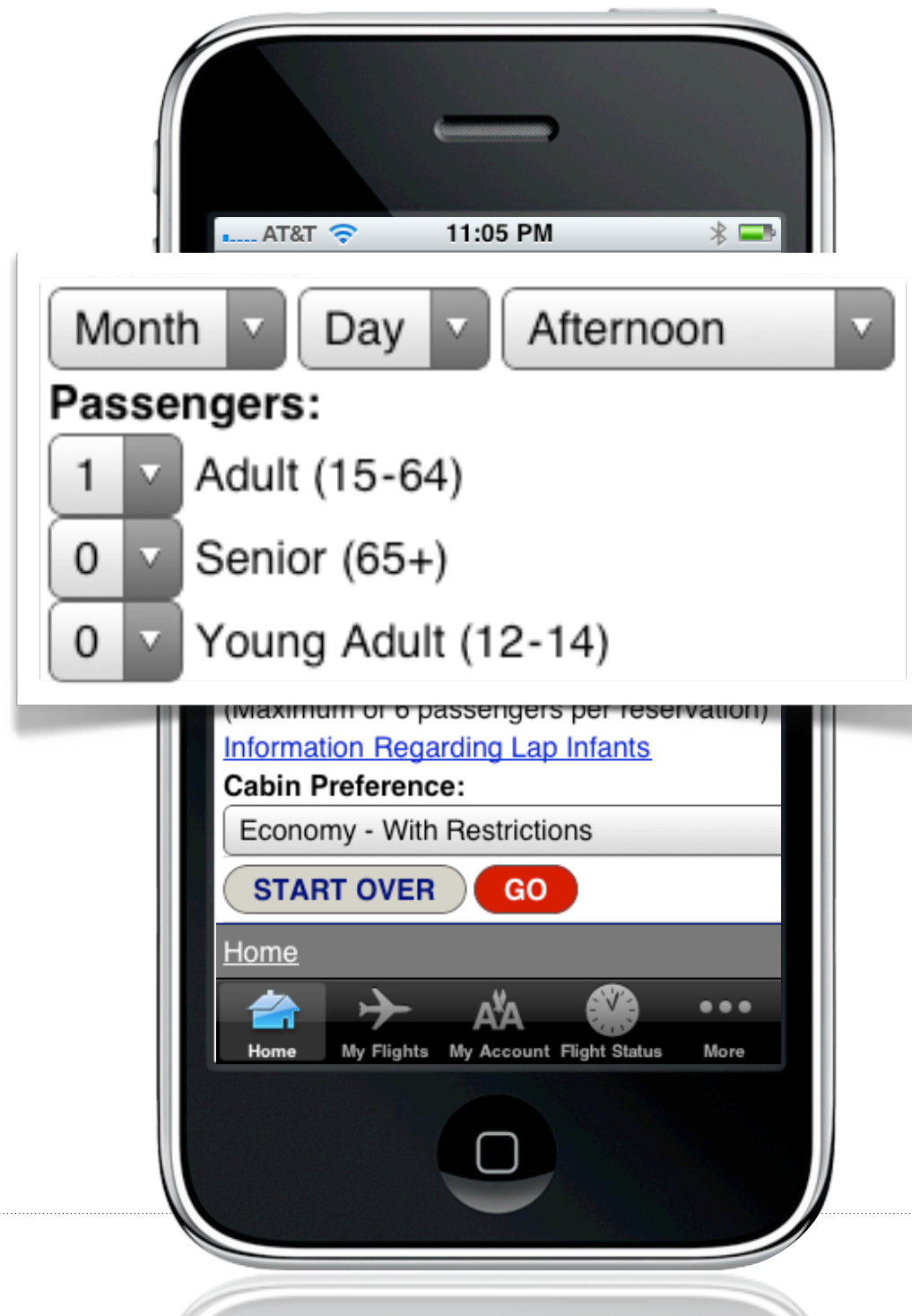


# select on Android

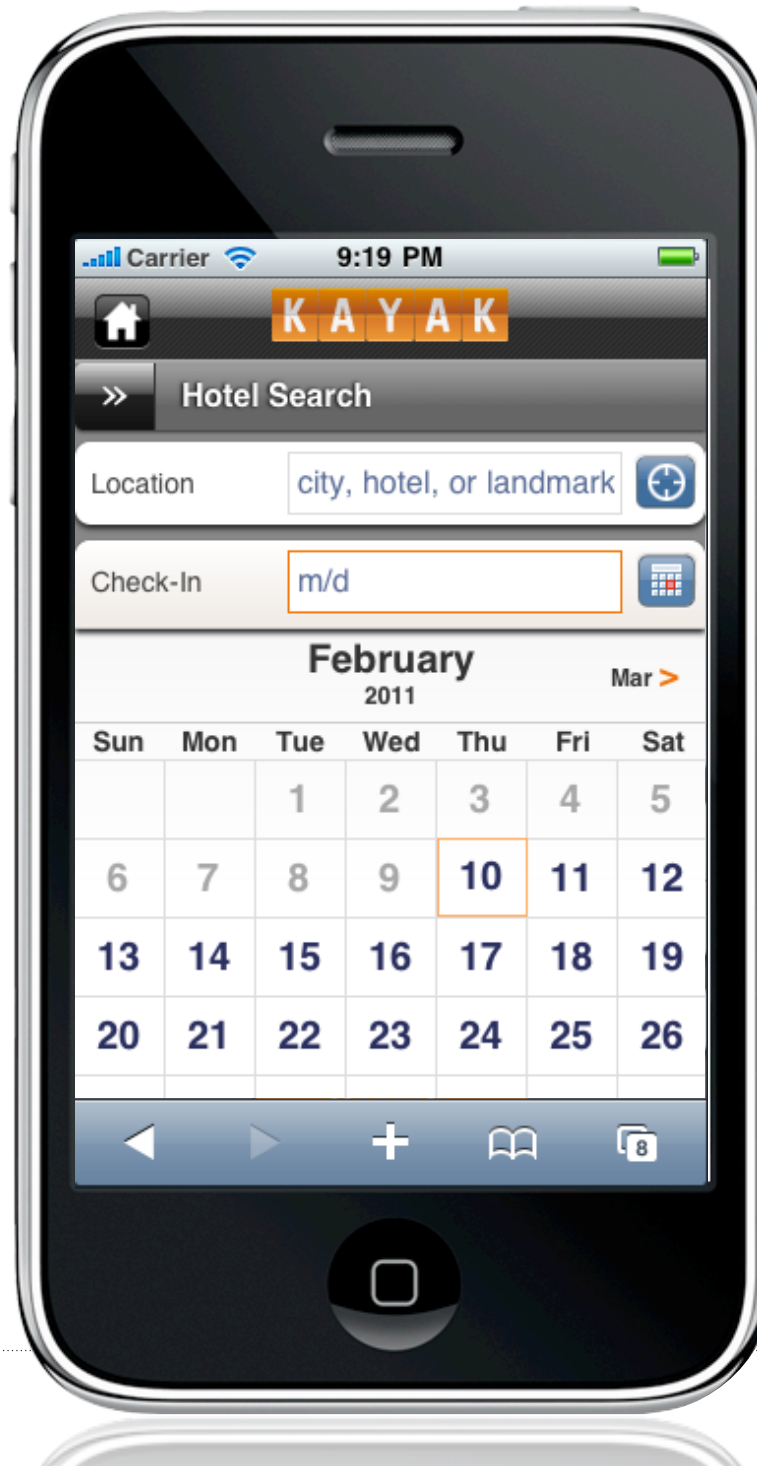
Device Optimized  
UI Control





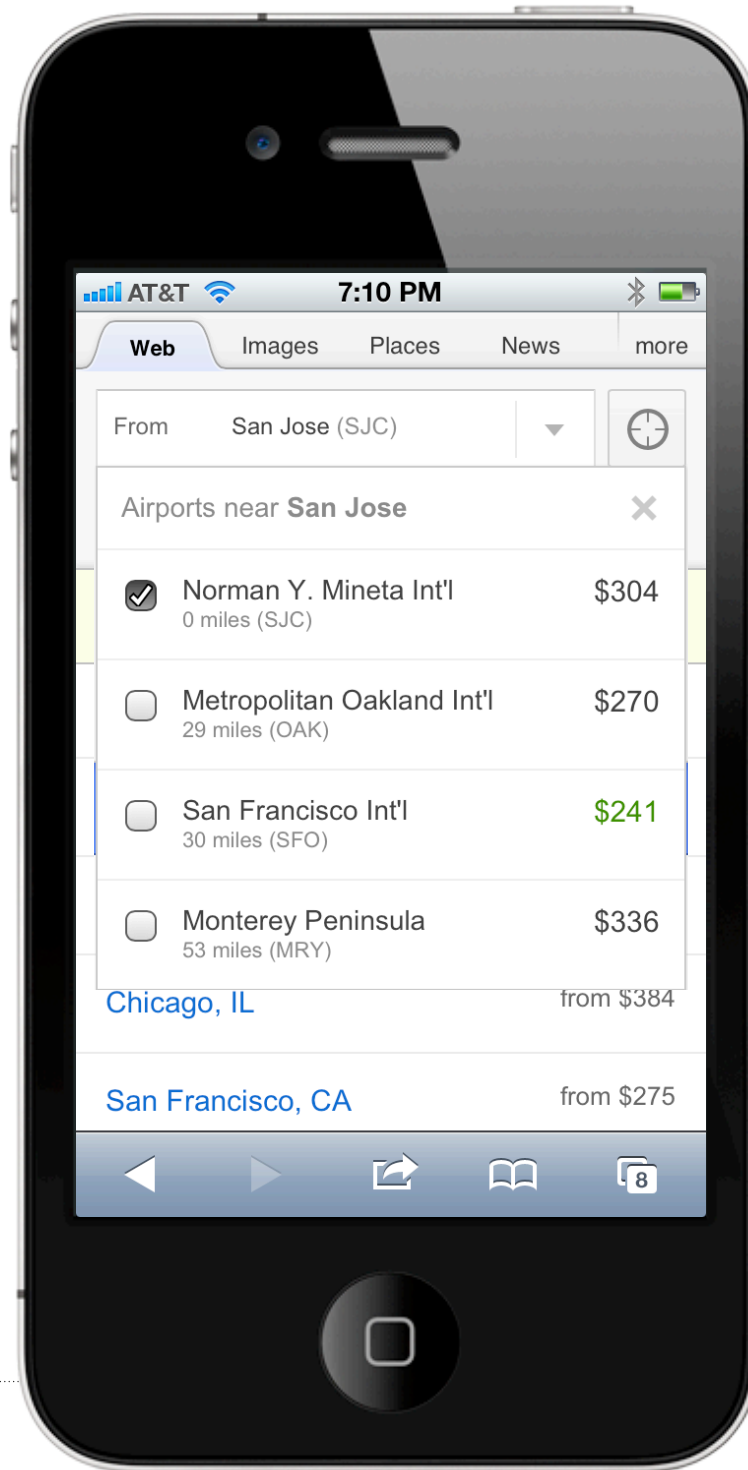


Steppers

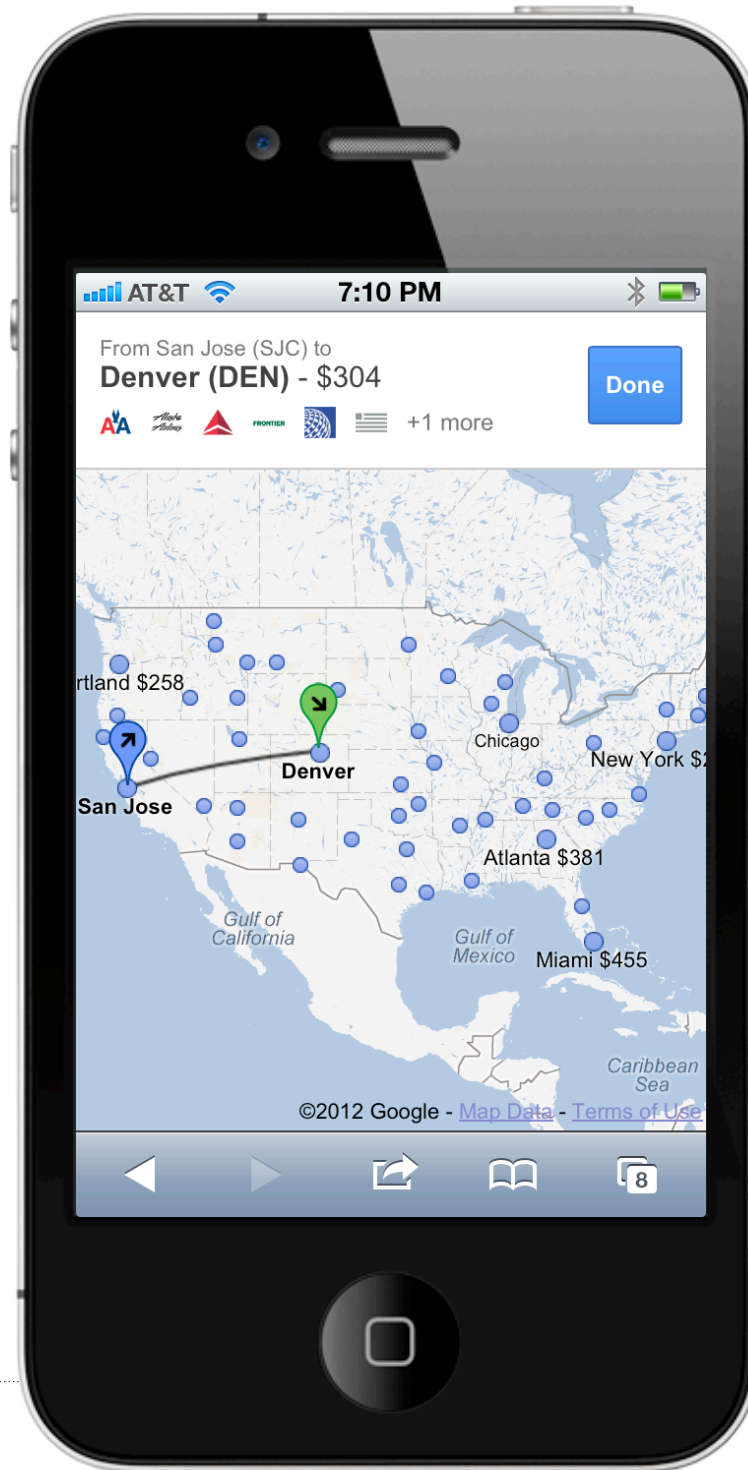


Touch Target Sizes

## Touch Target Sizes



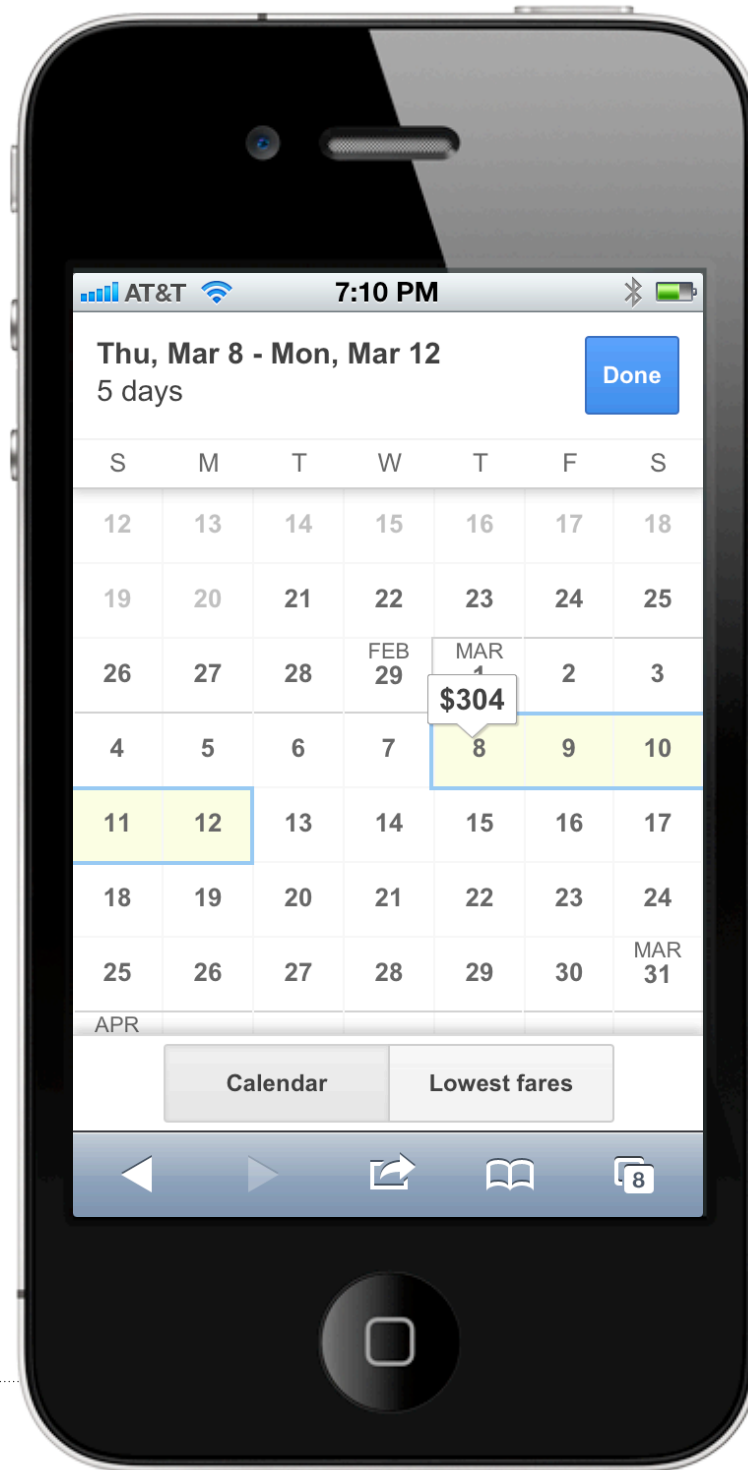
## Location Detection

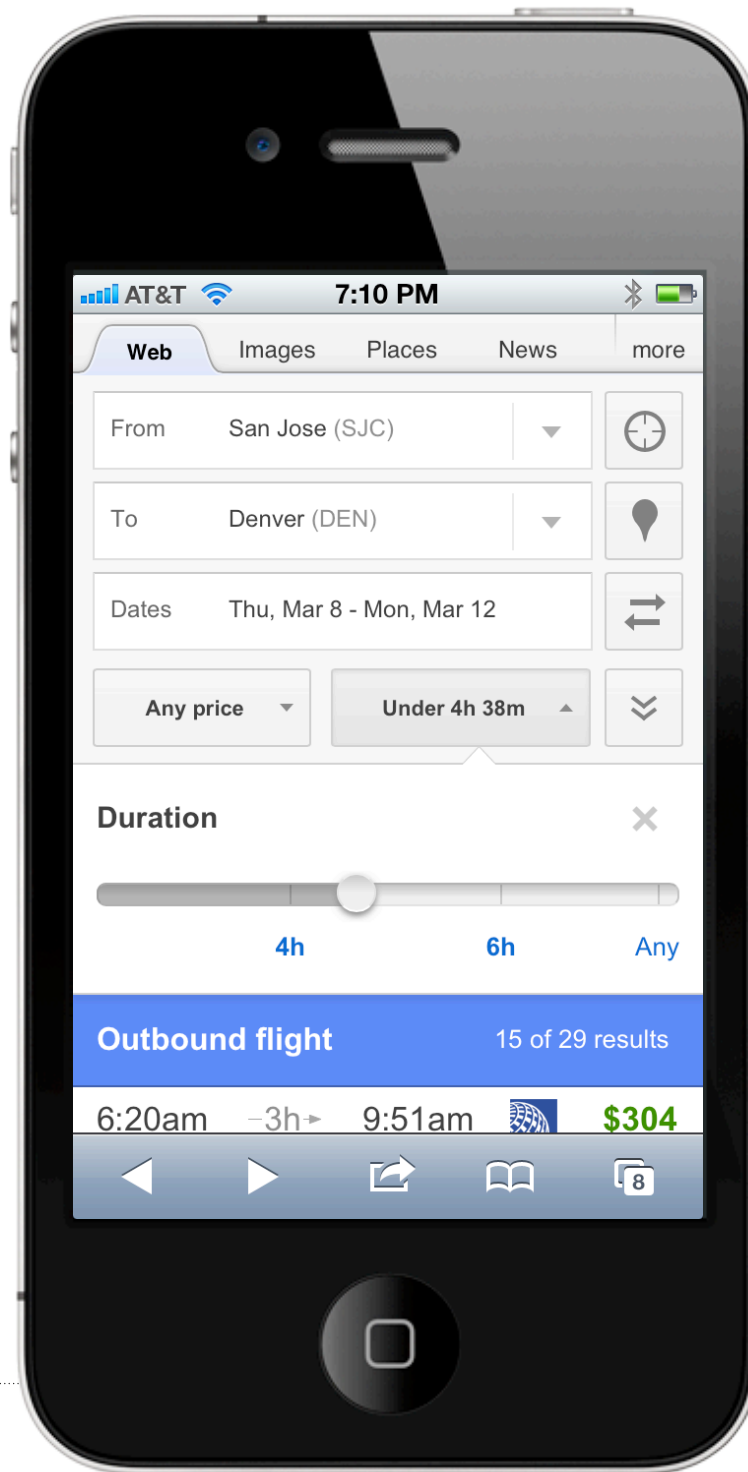


Touch  
Alternative to  
Typing



# Touch Target Sizes





» weather 🔍

🌐 Use my location Choose a location ▼

Bellevue, WA

☁️ 55°F | °C Humidity: 64%  
Wind: 4 mph

Overcast

11 AM 2 PM 5 PM 8 PM 11 PM



Tue



72°  
46°

Wed



61°  
45°

Thu



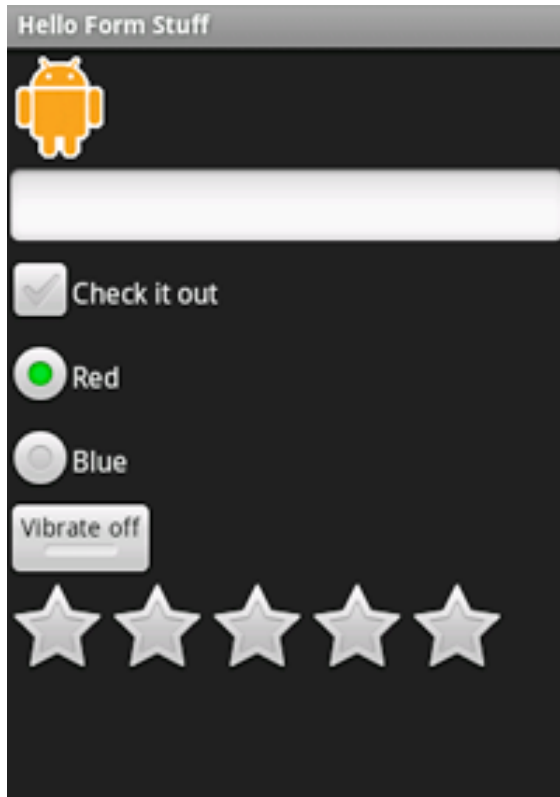
61°  
43°

Fri

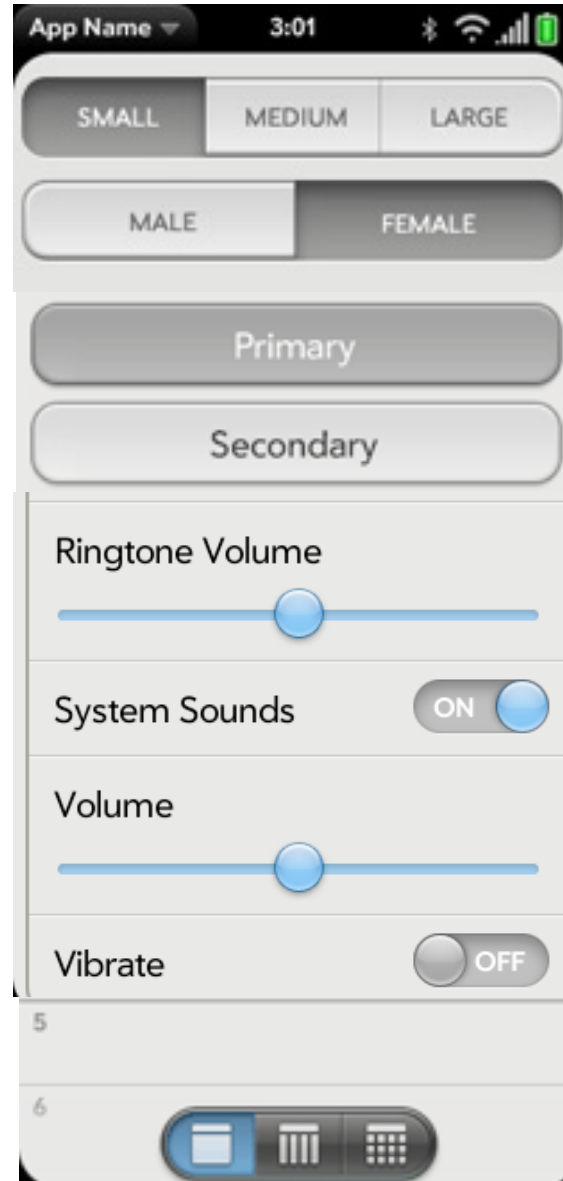


61°  
41°

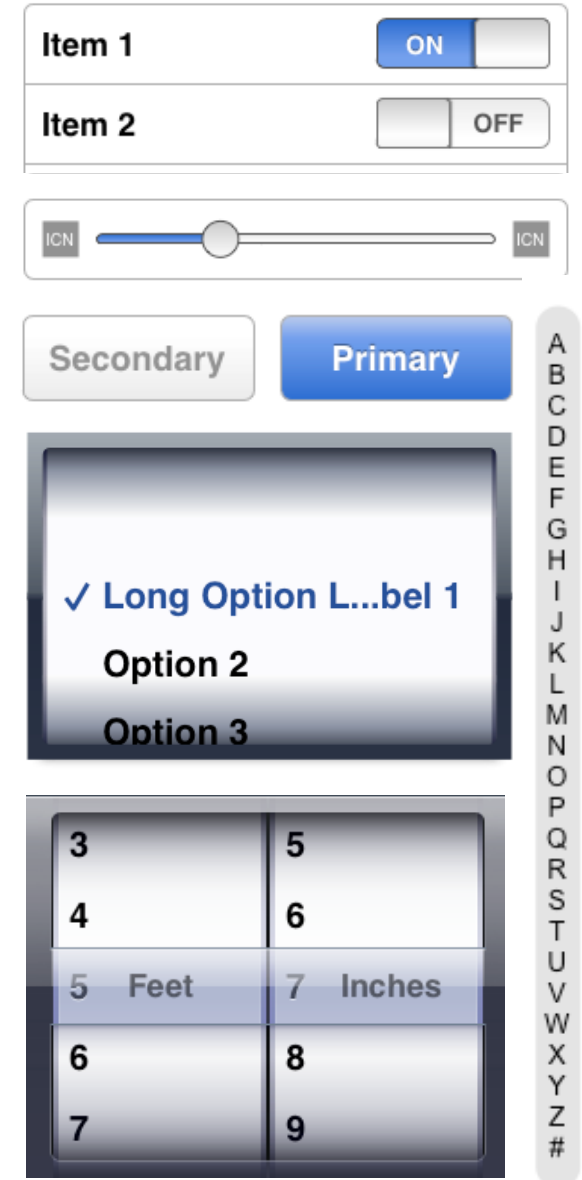
## Android



## WebOS



## iPhone OS

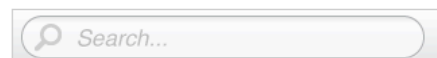




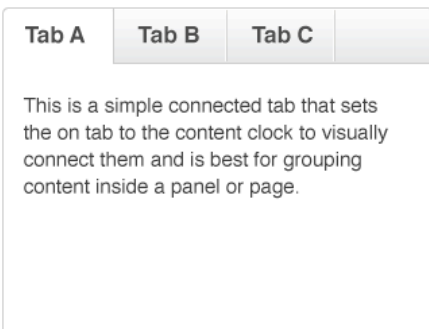
## Toolbar



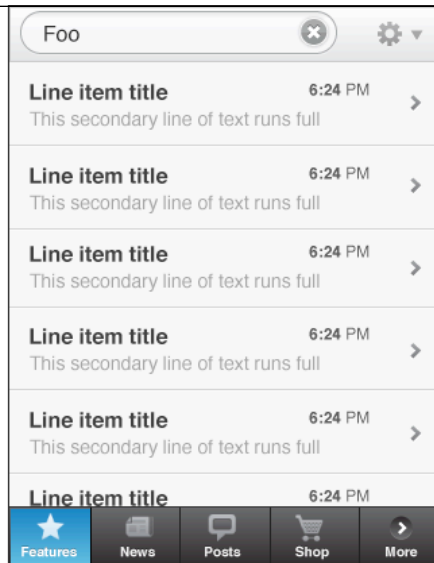
## Search bar



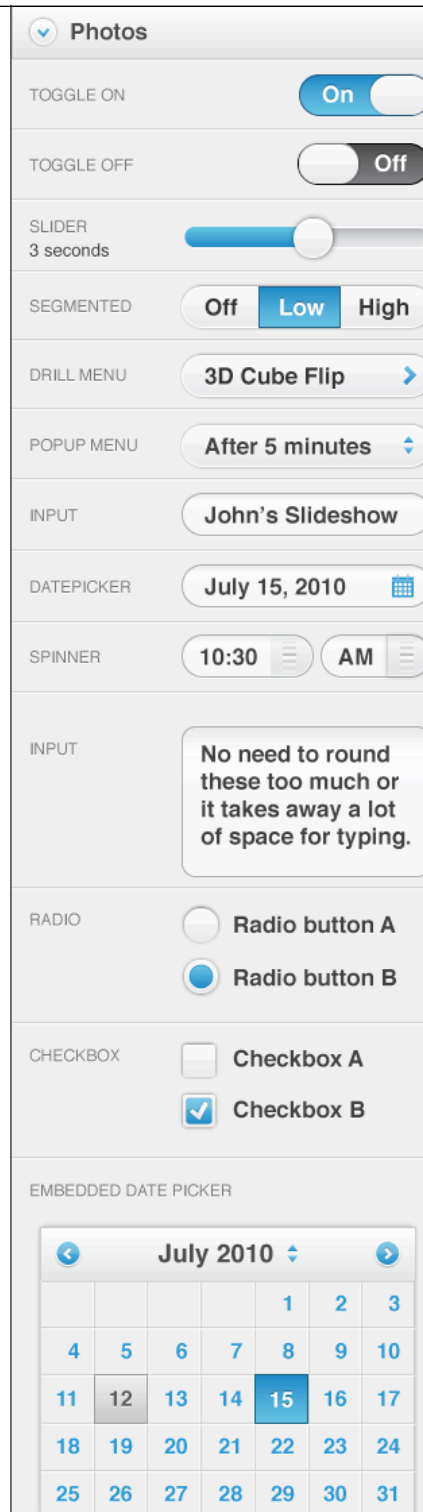
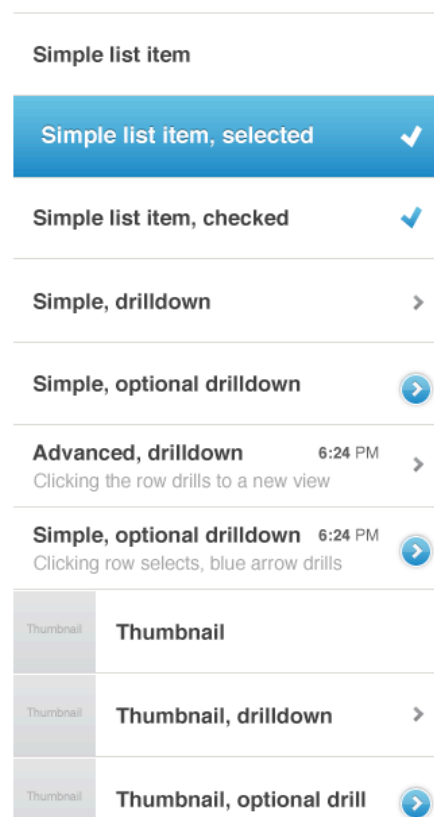
## Connected tabs



## Disconnected tab bar

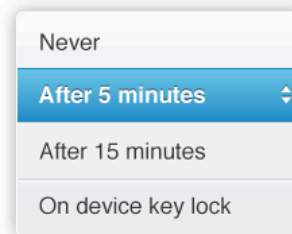


## List item variations

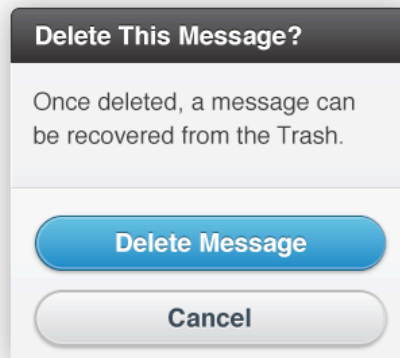


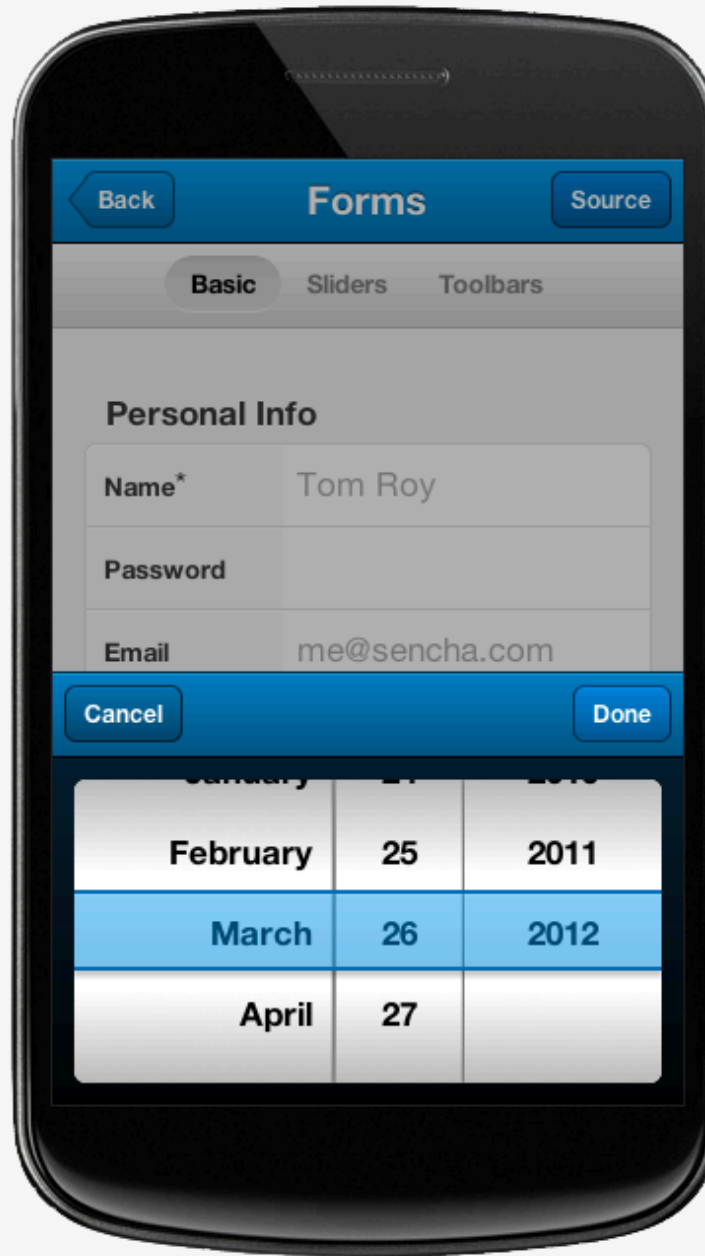
## Popup menu

(4-6 items max, drill page for more)



## Dialog





Month	Day	Year
February	25	2011
March	26	2012
April	27	

# NATIVE COMPONENTS

---



# ios

Purpose Description

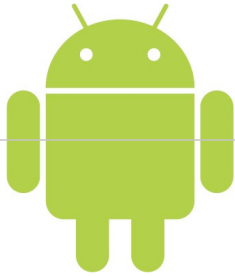
Name: First & Last

Placeholder

## Text Field

- accepts a single line of user input
- labels & placeholder text can be included within
- custom images on left (indicate purpose) or right (additional actions)





☒ DONE

PHONE

1 650-37

MOBILE

×

Add new

EMAIL

Email

HOME



## CONTROLS

# edit box

Edit box group label

This is an example of an edit field that has two lines of text.

Edit box group label

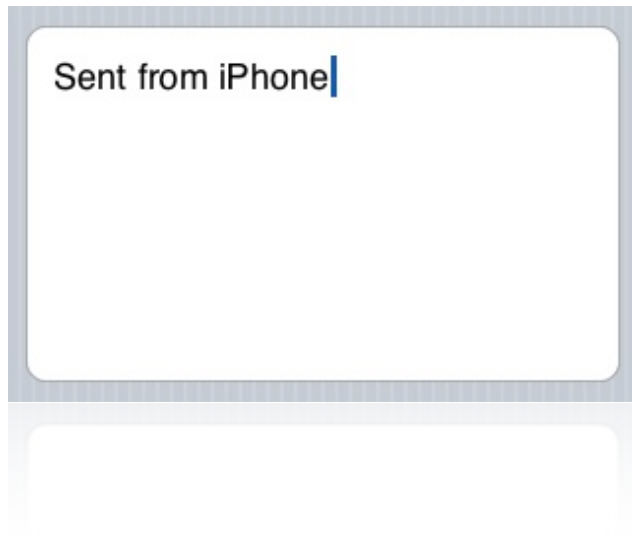
This is an example of an edit field that has three lines of text. This is an example of an edit field.

Edit box group label

This is an example of an edit field that has four lines of text. This is an example of an edit field that has four lines of text. This is an example of an edit field.

# ios

## Text View



- accepts & displays multiple lines of text
- any height & supports scrolling when the content doesn't fit
- font, color, and alignment can be set only for **all** text

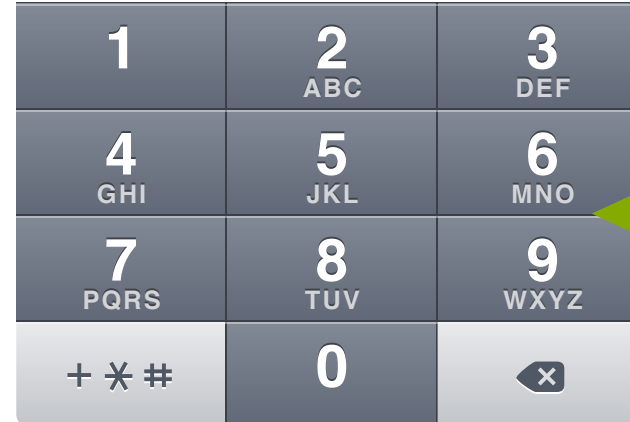
# ios



numbers meh

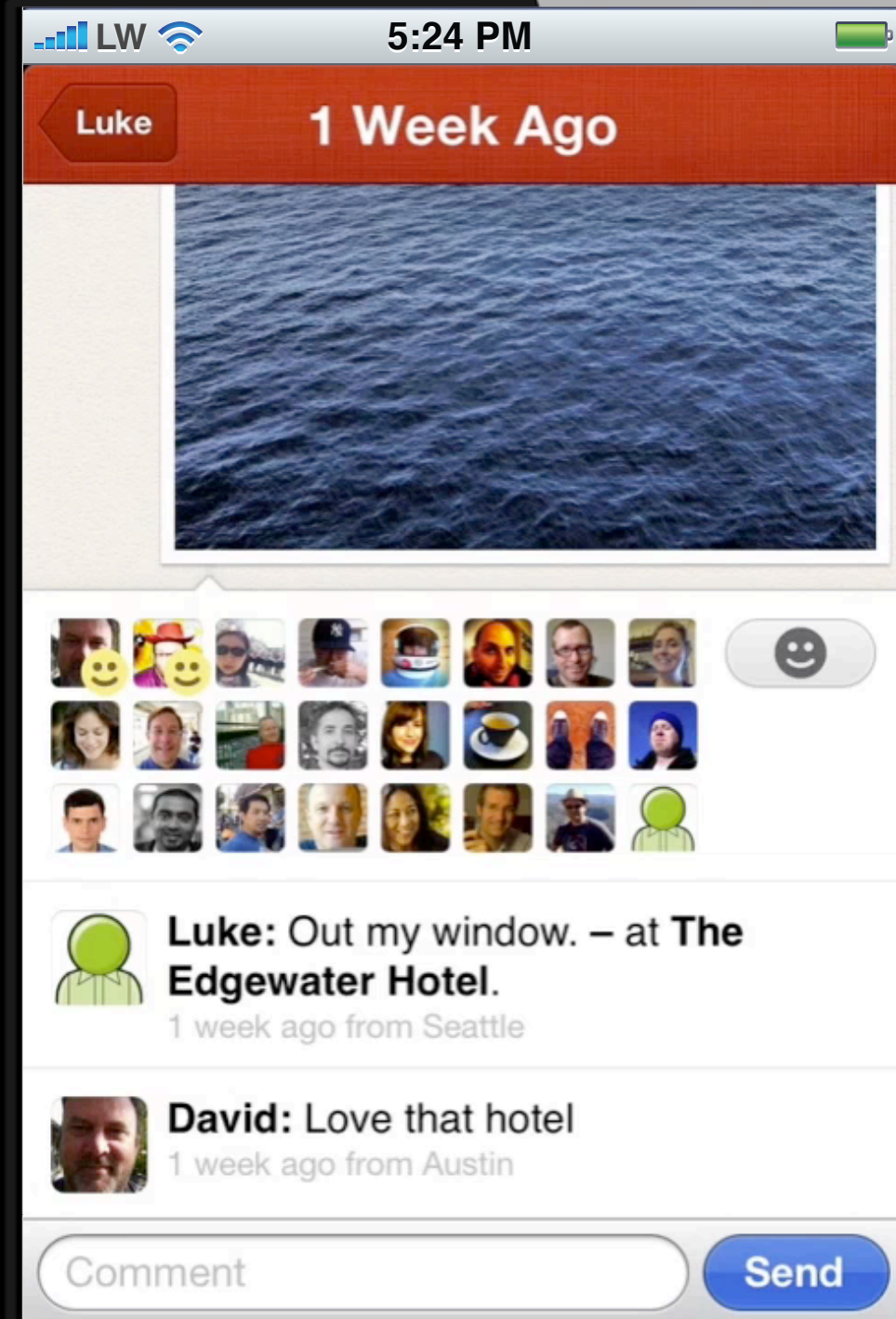


types!



numbers yah!

## Virtual Keyboard Access



# ios

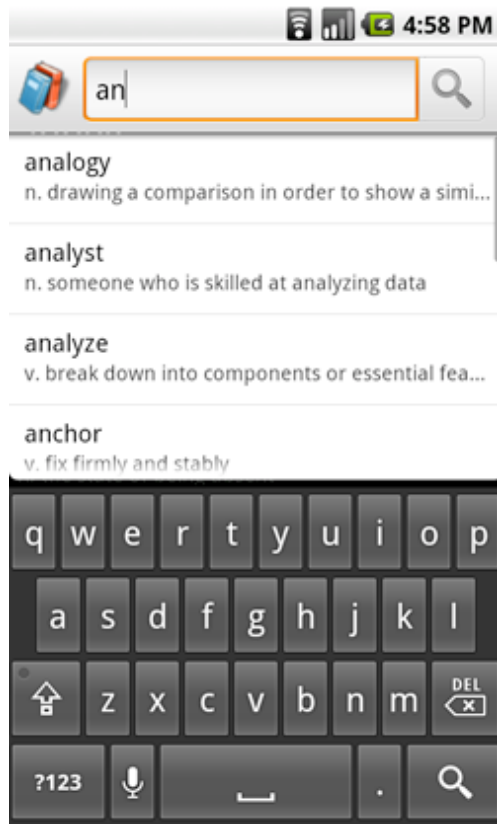
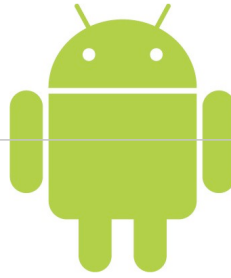
Purpose Description



Clear action

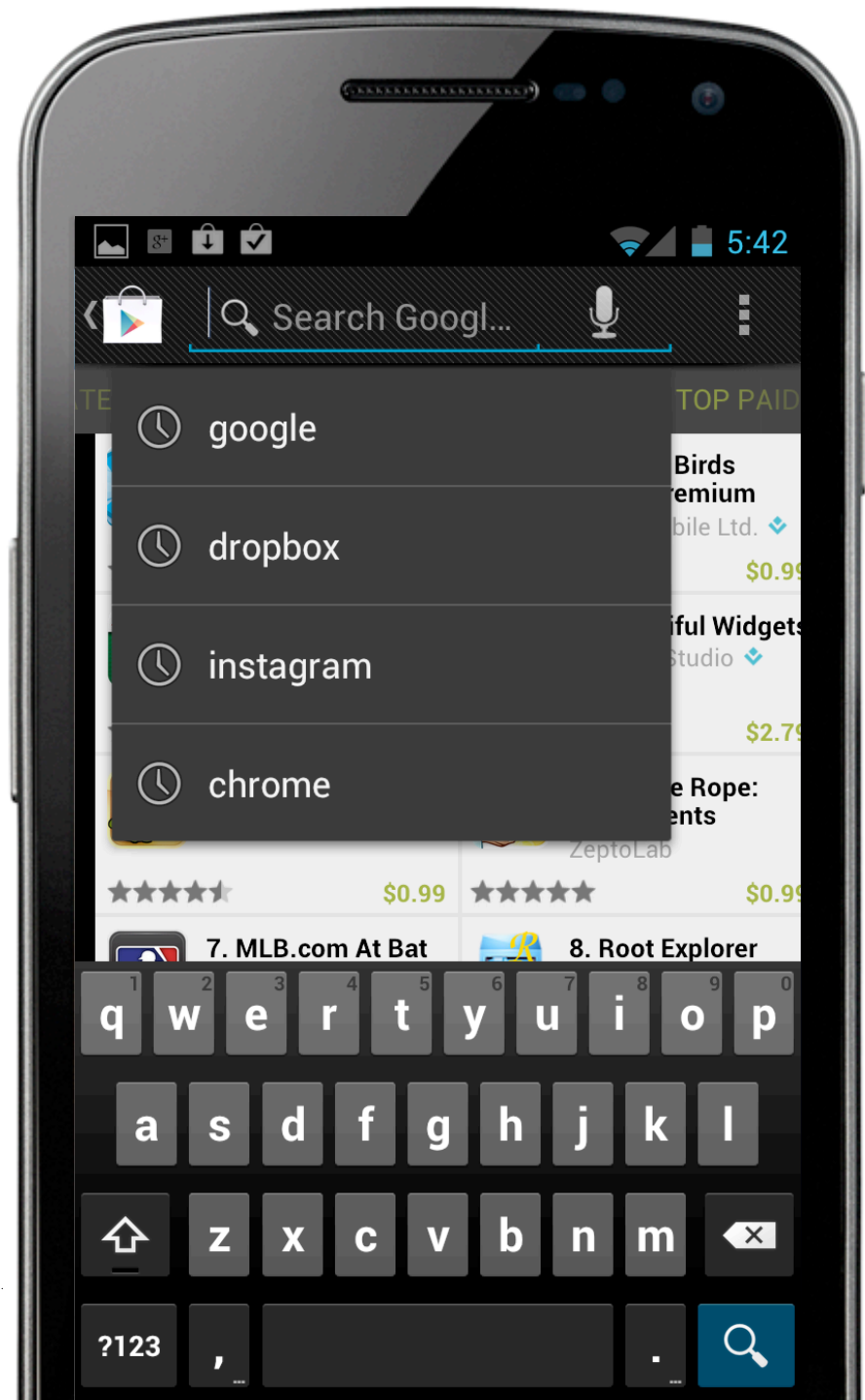
## Search Bar

- accepts text to use as search input
- options: placeholder, bookmarks, clear button, results button, and prompt
- can set custom background image or tint color

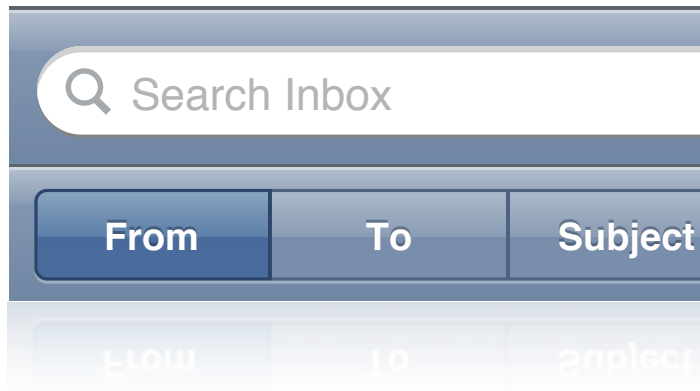


- SearchView widget “iconified” by default
- voice search option
- recent query suggestions
- custom query suggestions

icon, placeholder, voice search,  
recent query suggestions



# ios



## Scope Bar

- used to define scope of search
- only in conjunction with search
- use for clearly defined categories to narrow results
- customize: background, dividers, active/inactive states

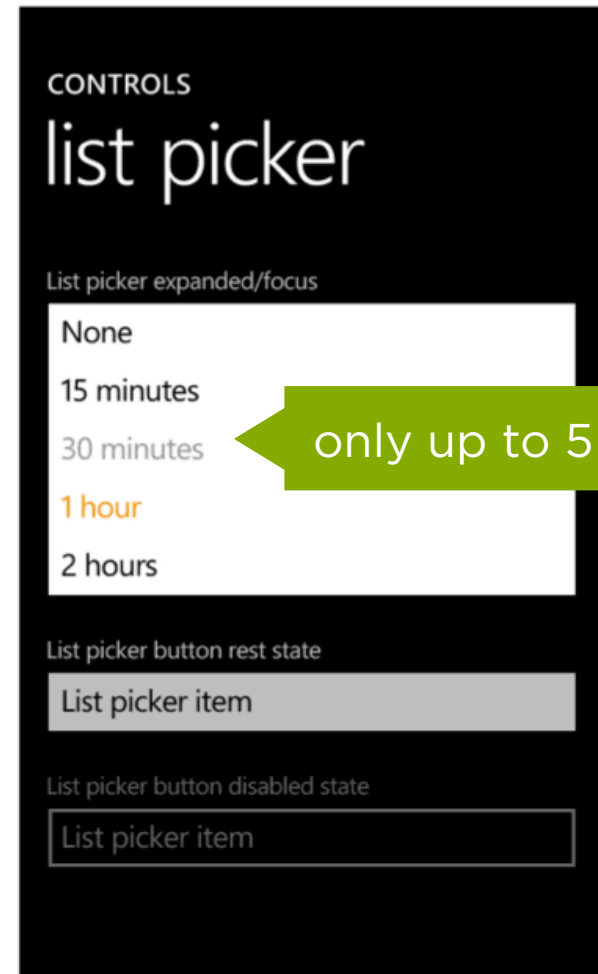
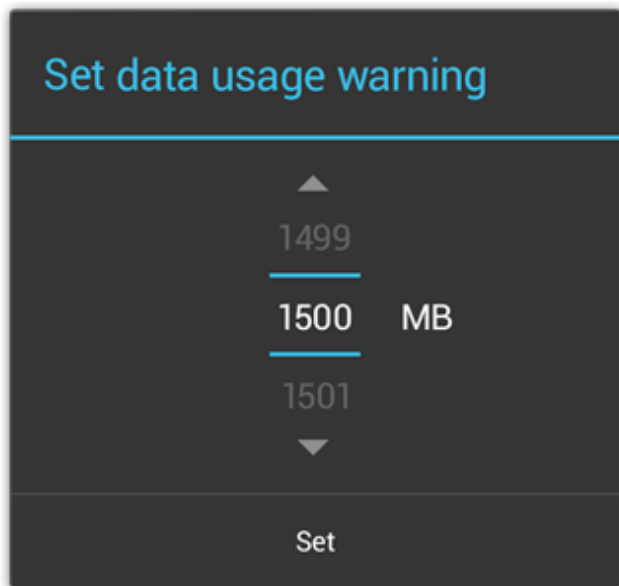
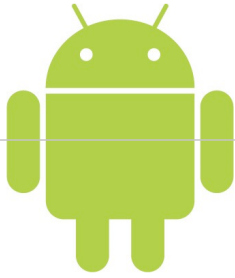


# ios

## Picker Menu



- display set of values to select from
- best when values are known as they are hidden by default
- consider using a table if you have lots of or long values





## CONTROLS

# picker box

Picker entry point rest state

None

Picker entry point finger down state

None

Picker entry point disabled state

None

## PICKER BOX HEADER

Text example showing

Text example showing screen

Text example

Text example showing screen

Text example

Text example showing screen

Text example

## PICKER BOX HEADER

☐ Lorem ipsum  
Lorem ipsum dolor sit amet  
Lorem ipsum dolor sit amet

☒ Lorem ipsum  
Lorem ipsum dolor sit amet  
Lorem ipsum dolor sit amet

☒ Lorem ipsum  
Lorem ipsum dolor sit amet  
Lorem ipsum dolor sit amet

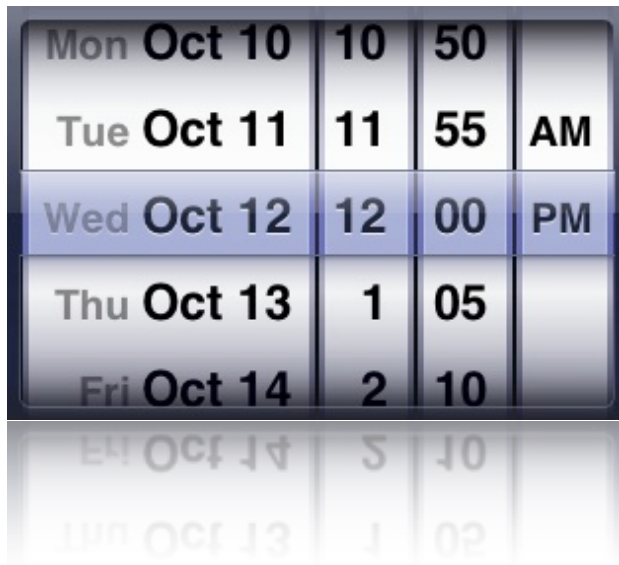
☒ Lorem ipsum  
Lorem ipsum dolor sit amet  
Lorem ipsum dolor sit amet

☐ Lorem ipsum  
Lorem ipsum dolor sit amet  
Lorem ipsum dolor sit amet

done

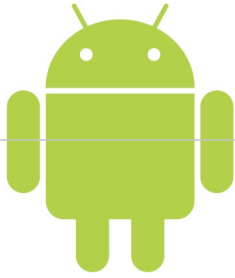
cancel

# ios



## Multiple Picker Menu

- allow users to pick values consisting of multiple parts
- up to four independent wheels
- final value is composed of content in all wheels
- values should have small range & be commonly known
- date & time, date, time, countdown



Set time

▲	▲	▲
7	29	
8	:	30
9		PM
▼	▼	▼

Cancel	Set
--------	-----



12:38

SELECT START DATE

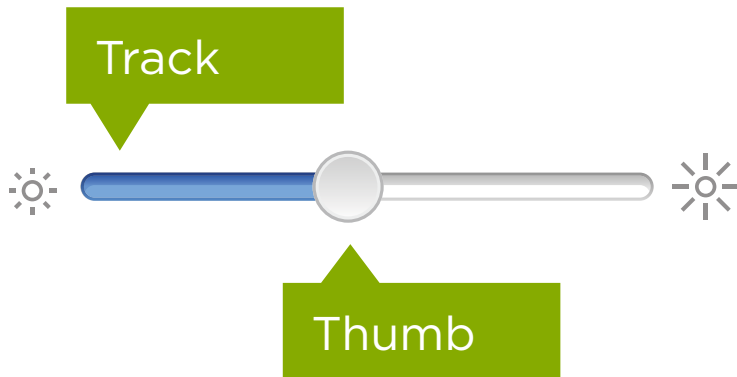
12 december		
01 january		
02 february	23 wednesday	2010
03 march		
04		

done	cancel
------	--------

# ios

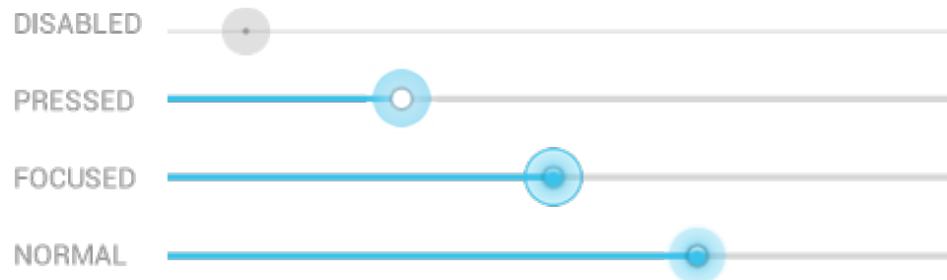
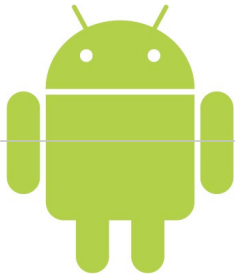


# ios



## Slider

- make adjustments to a value throughout a range of allowed values
- use for fine-grained control
- customize with: images on sides, vertical/horizontal, width, different track and/or thumb



## CONTROLS slider

12:38

Set sample value



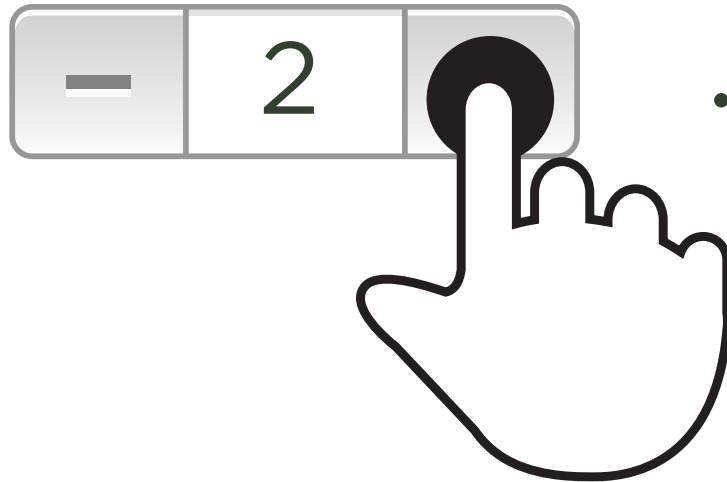
Set sample value





# iOS

iOS 5



## Stepper

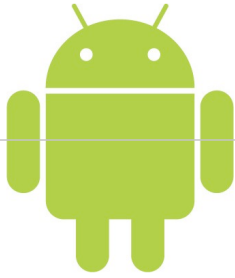
- increase or decrease value by a constant amount
- to make small adjustments to a value
- by default does not display values

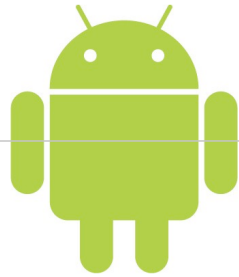
# ios



## Switch

- two simple, diametrically opposed choices
- two mutually exclusive states
- customize: tint for on-state





	NORMAL	FOCUSED	PRESSED	DISABLED	DISABLED FOCUSED
UNCHECKED	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
CHECKED	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

UNCHECKED	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
CHECKED	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

CONTROLS

## check box

Check box group label

☐ Rest state    ☒ Rest state

☐ Finger down    ☒ Finger down

☒ Finger up    ☐ Finger up

☒ Disabled checked

☐ Disabled unchecked

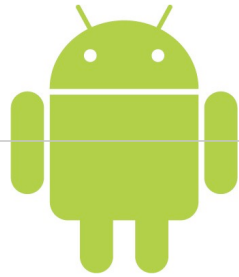
☐ Intermediate

# ios

Every 15 Minutes	
Every 30 Minutes	✓
Hourly	
Manually	

## Table View

- data in a single column of rows
- can be divided into sections or groups
- use checkmark to select options
- can limit the selection to one row or allow multiple selections
- use disclosure indicator for input (separate screen)



	NORMAL	FOCUSED	PRESSED	DISABLED	DISABLED FOCUSED
UNCHECKED					
CHECKED					

UNCHECKED					
CHECKED					

## CONTROLS

# radio button

Radio button interaction states

- Rest state
- Finger down
- Finger up
- Disabled unselected
- Disabled selected

# ios



## Segmented Control

- closely related, but mutually exclusive choices
- 5 or fewer segments
- can contain text **or** images
- customize with images or tints

# iOS



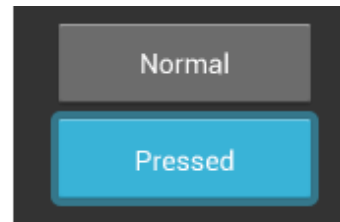
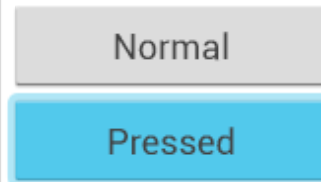
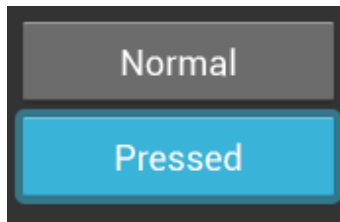
## Buttons

- initiate an application-specific action
- iOS provides numerous standard buttons for use in navigation bars and toolbars
- customize: iOS styles, custom images

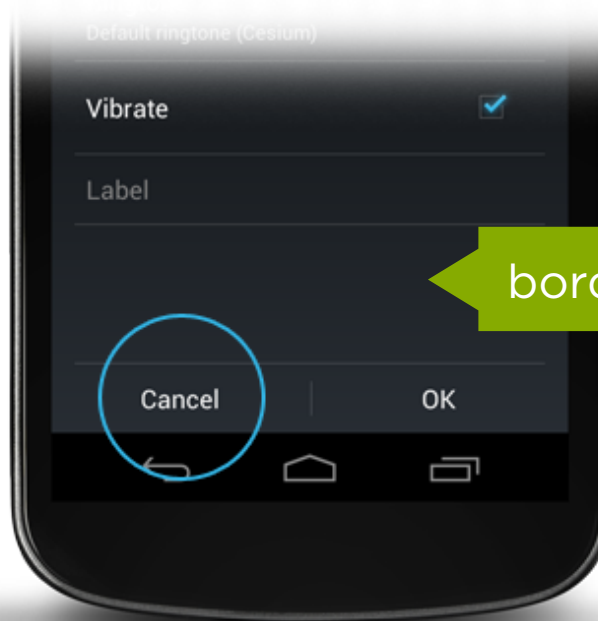
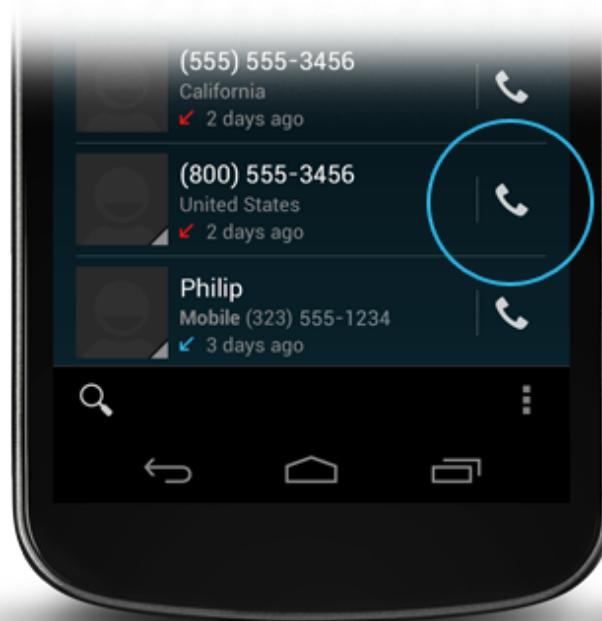
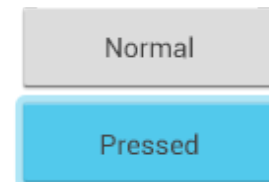




default buttons



small buttons



borderless buttons

## CONTROLS

# command buttons

### primary text

Lorem ipsum dolor sit amet, consectetur elit

### primary text

Lorem ipsum dolor sit amet, consectetur elit  
adipiscing elit, sed do eiusmod.



## CONTROLS

# push button

Push button rest state

button

Push button finger down

button

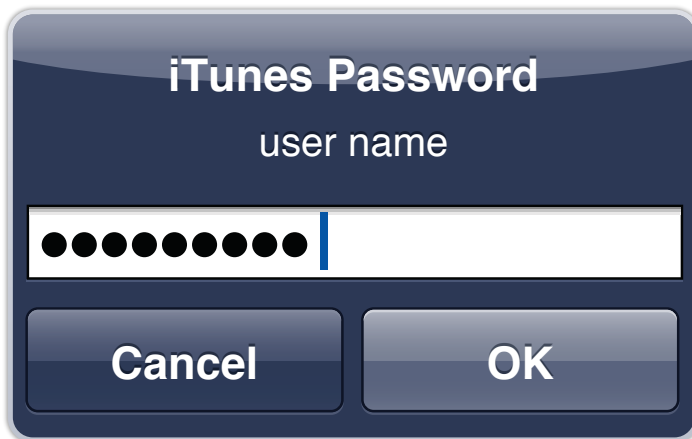
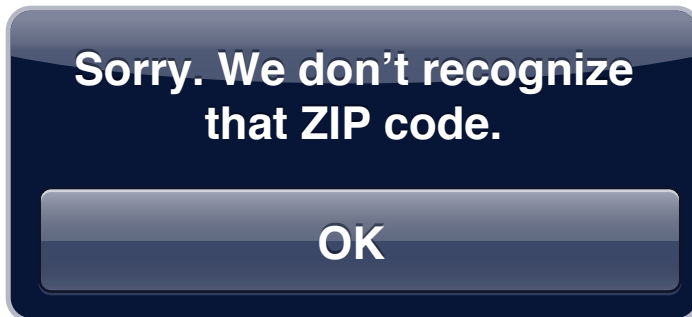
Push button finger up

button

Push button disabled state

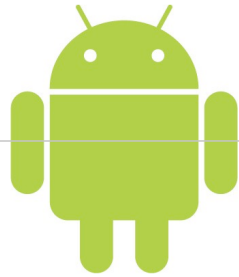
button

# ios



## Alerts

- provides important information
- for critical information: frequently used for input error messaging
- customize: title, message, buttons, up to text fields
- keep it short



Unfortunately, the process com.  
android.phone has stopped.

Report

OK

Playlist name

Playlist 1

Cancel

OK



12:38

Lorem ipsum dolor

Excepteur sint occaecat cupidatat non  
proident, sunt in culpa qui officia deserunt  
mollit anim id est laborum.

☒ Don't show again

lorem

ipsum

June 2, 2015 10:42 AM

Lorem ipsum dolor sit amet, consectetur  
adipiscing elit, sed do eiusmod tempor  
incididunt ut labore et dolore magna aliqua.  
Ut enim ad minim veniam, quis nostrud  
exercitation ullamco laboris nisi ut aliquip  
ex ea commodo consequat. Duis aute irure  
dolor in reprehenderit in voluptate velit



# ios



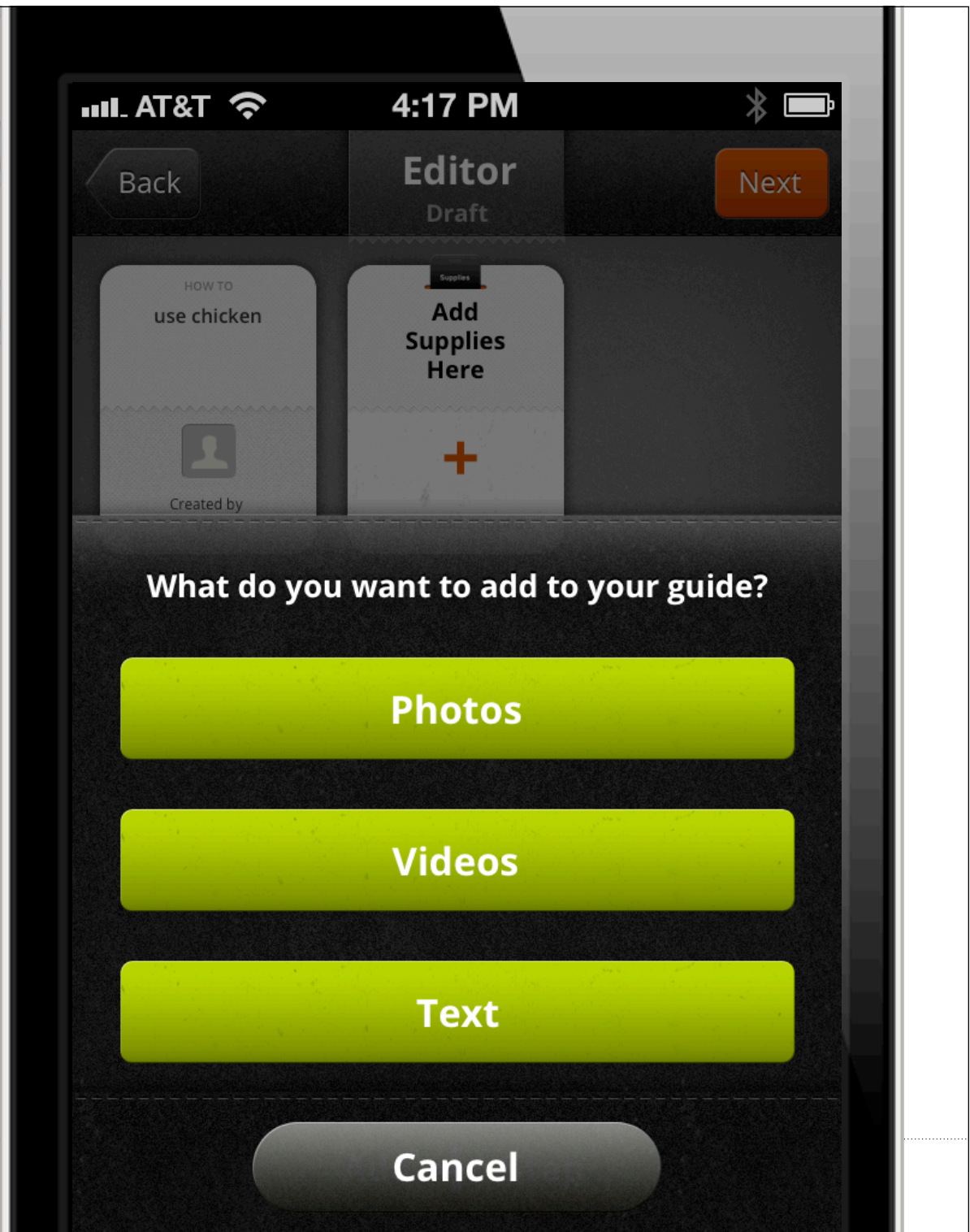
## Action Sheets

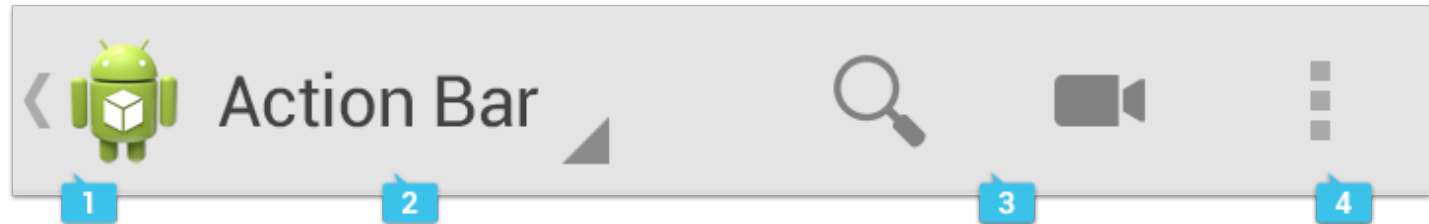
- displays a set of choices related to a task the user initiates
- provide alternate ways a task can be completed
- get confirmation before completing a potentially dangerous task
- include cancel actions
- customize: black/blue style, red button color

# Action Sheets

label

custom styling





reply  
forward  
mark as unread

reply



## Android



## iOS

## Windows Phone



ButtonView	Rounded Rectangle Button	Button
CheckBox	Table/Switch	CheckBox
EditText	Text Field/Label	TextBlock
EditText	Text Field/Text View	Edit Box
EditText	Text Field	PasswordBox
SeekBar	Slider	Slider
Picker	Picker	ListPicker/Box
TimePicker	Time Picker	Timepicker
RatingBar		
Toggle button	Switch	ToggleSwitch
DatePicker	Date Picker	Datepicker
RadioButton, RadioGroup	Table/Segmented Control	RadioButton

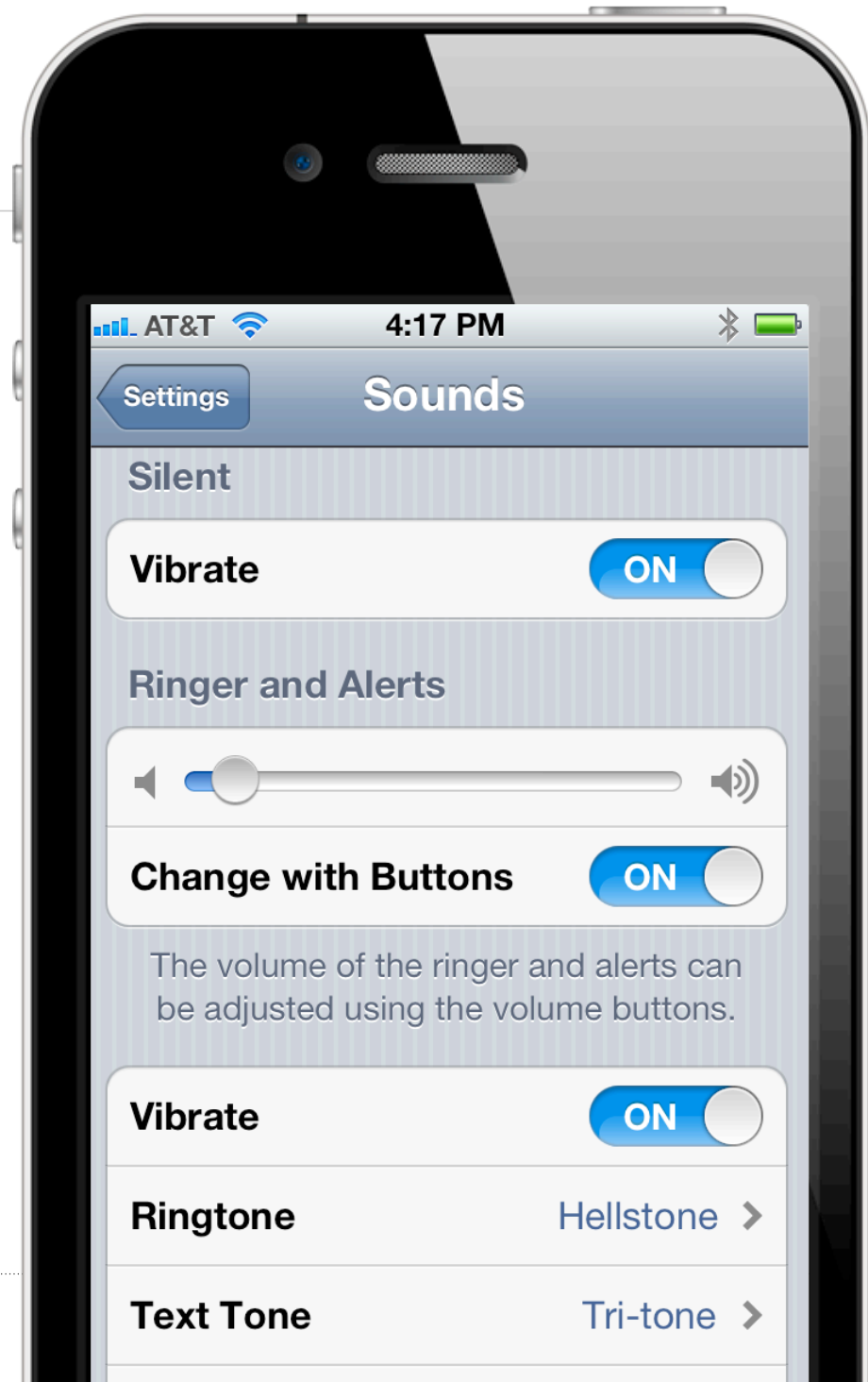


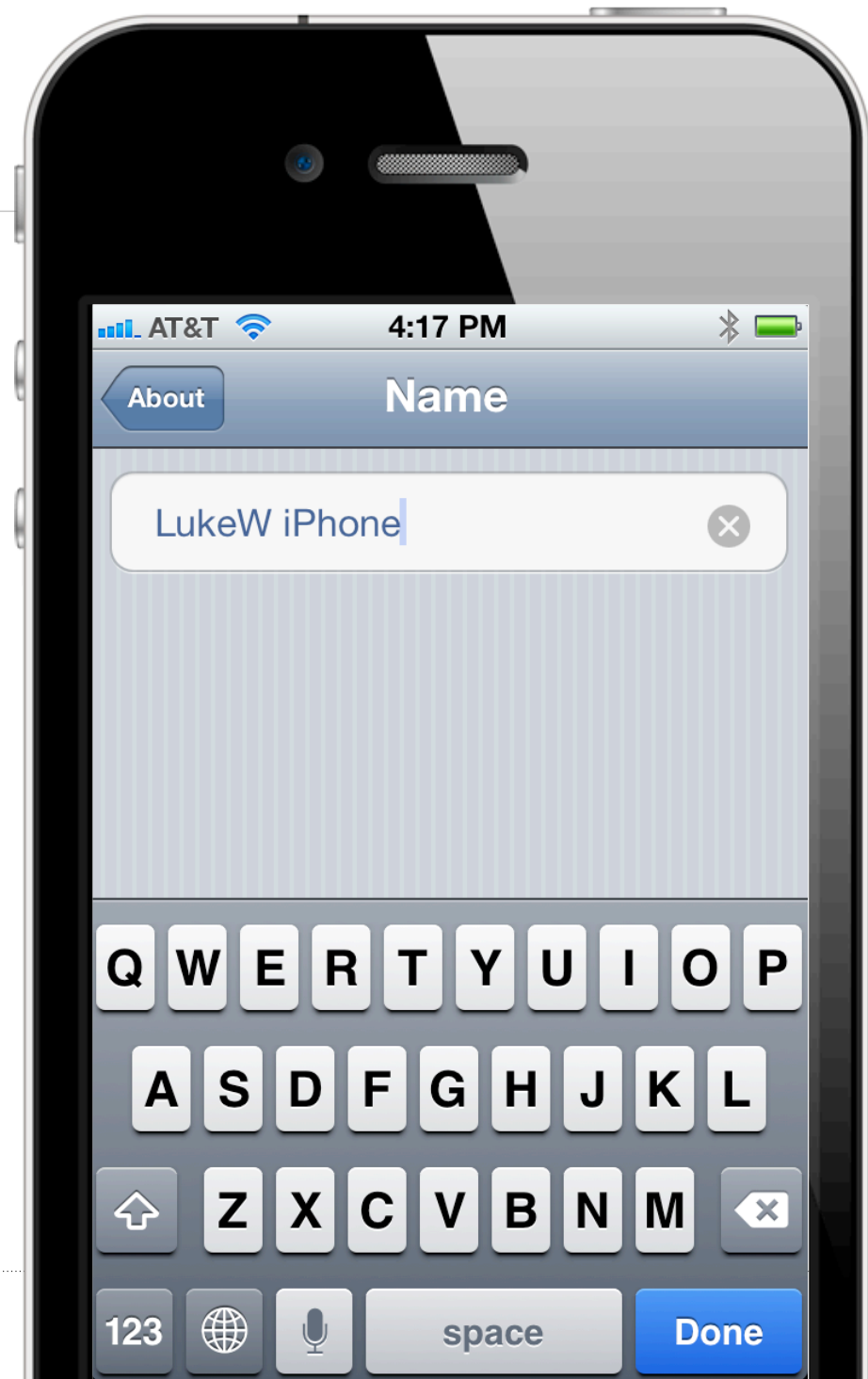
Label

Slider

Switch

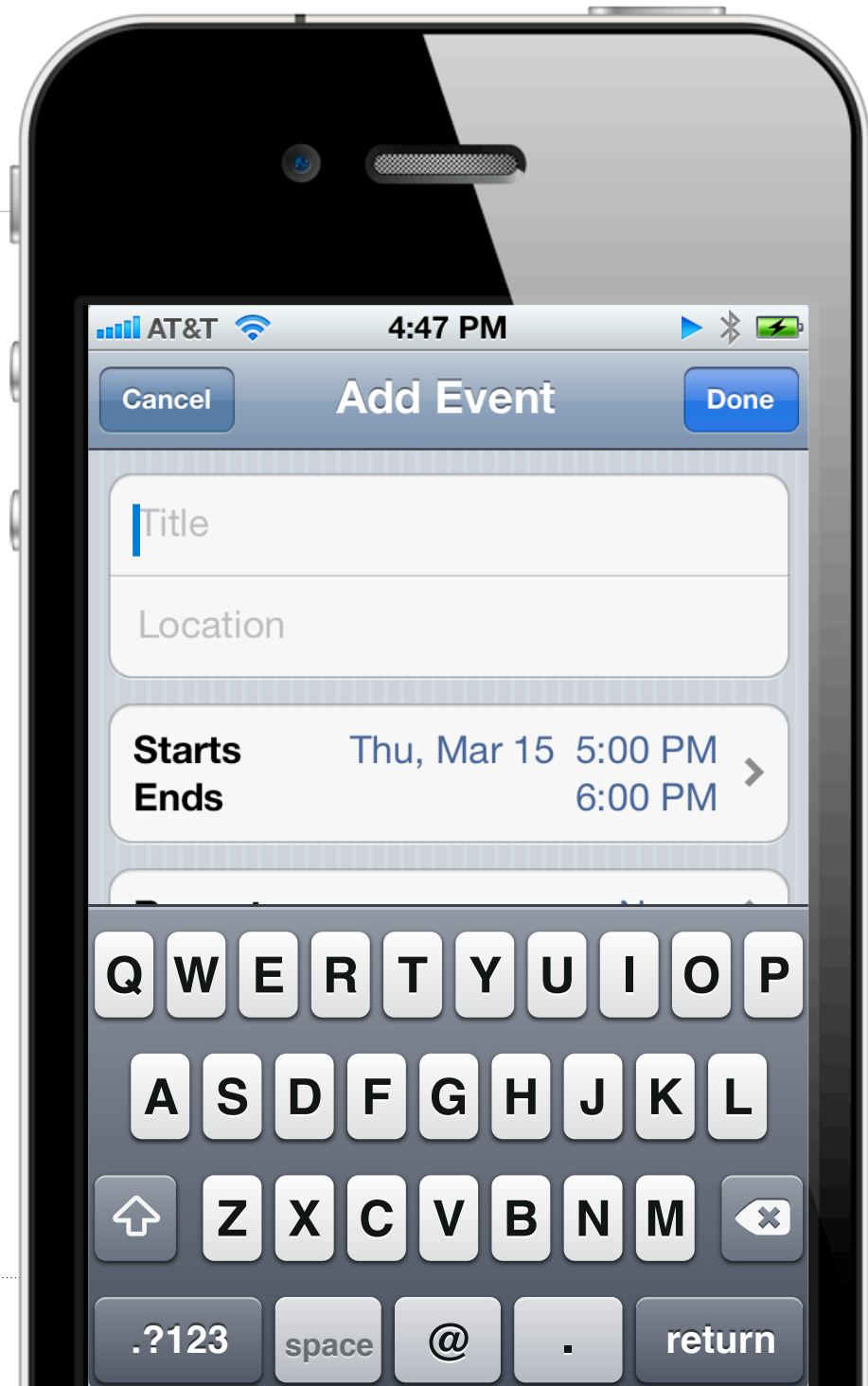
Disclosure Indicator

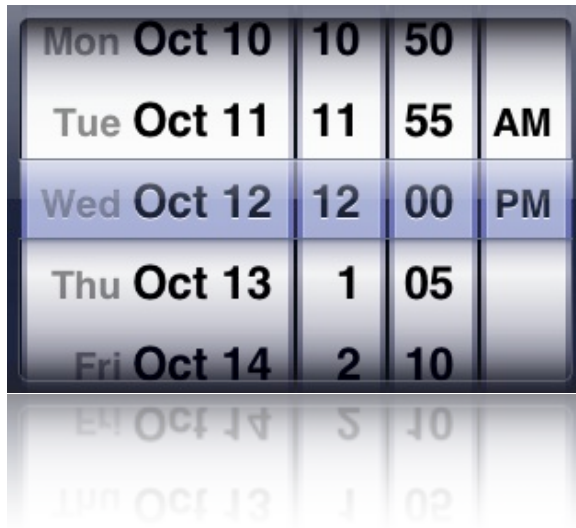




Text Fields

Instantly Jump Into  
Input Mode



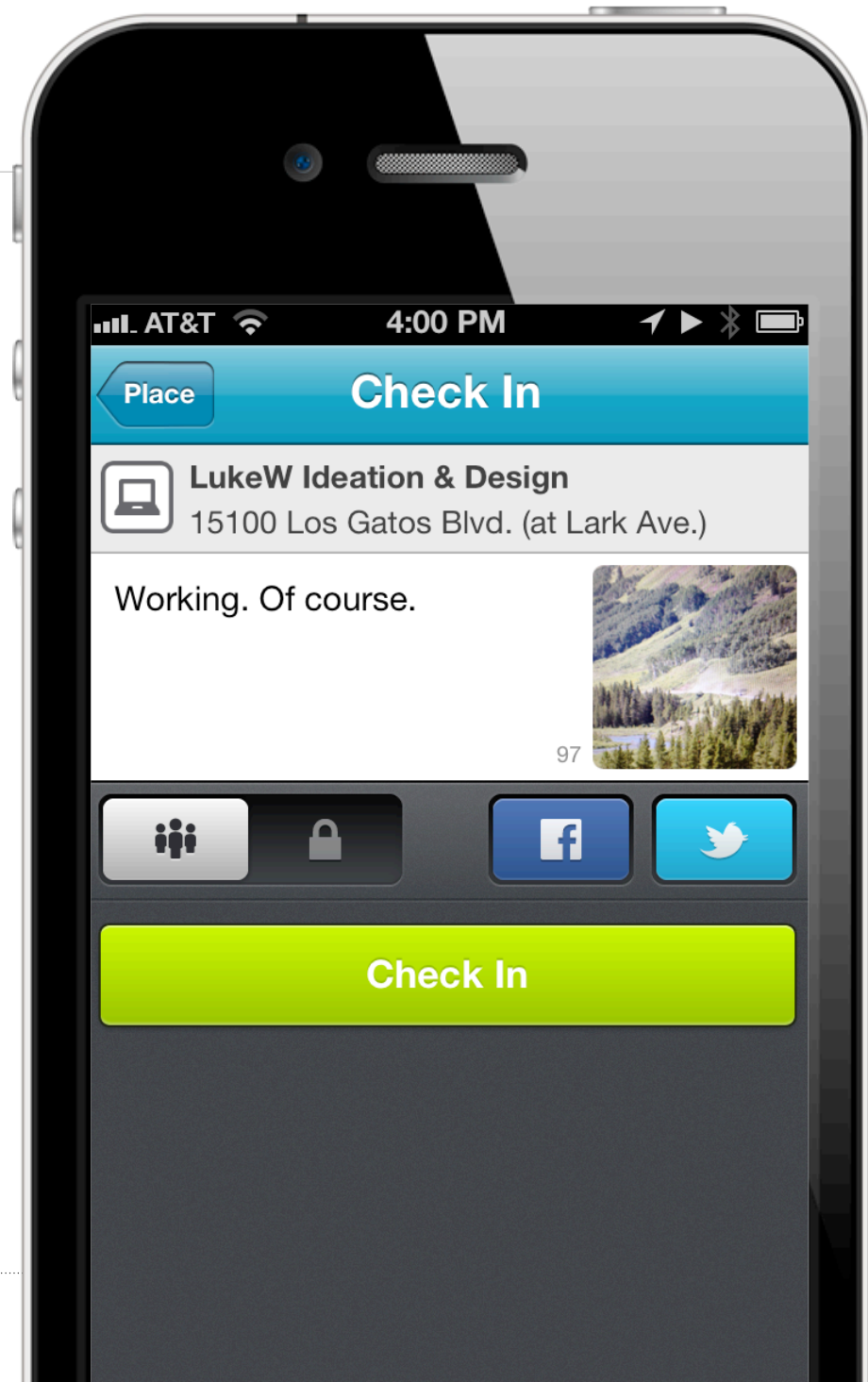


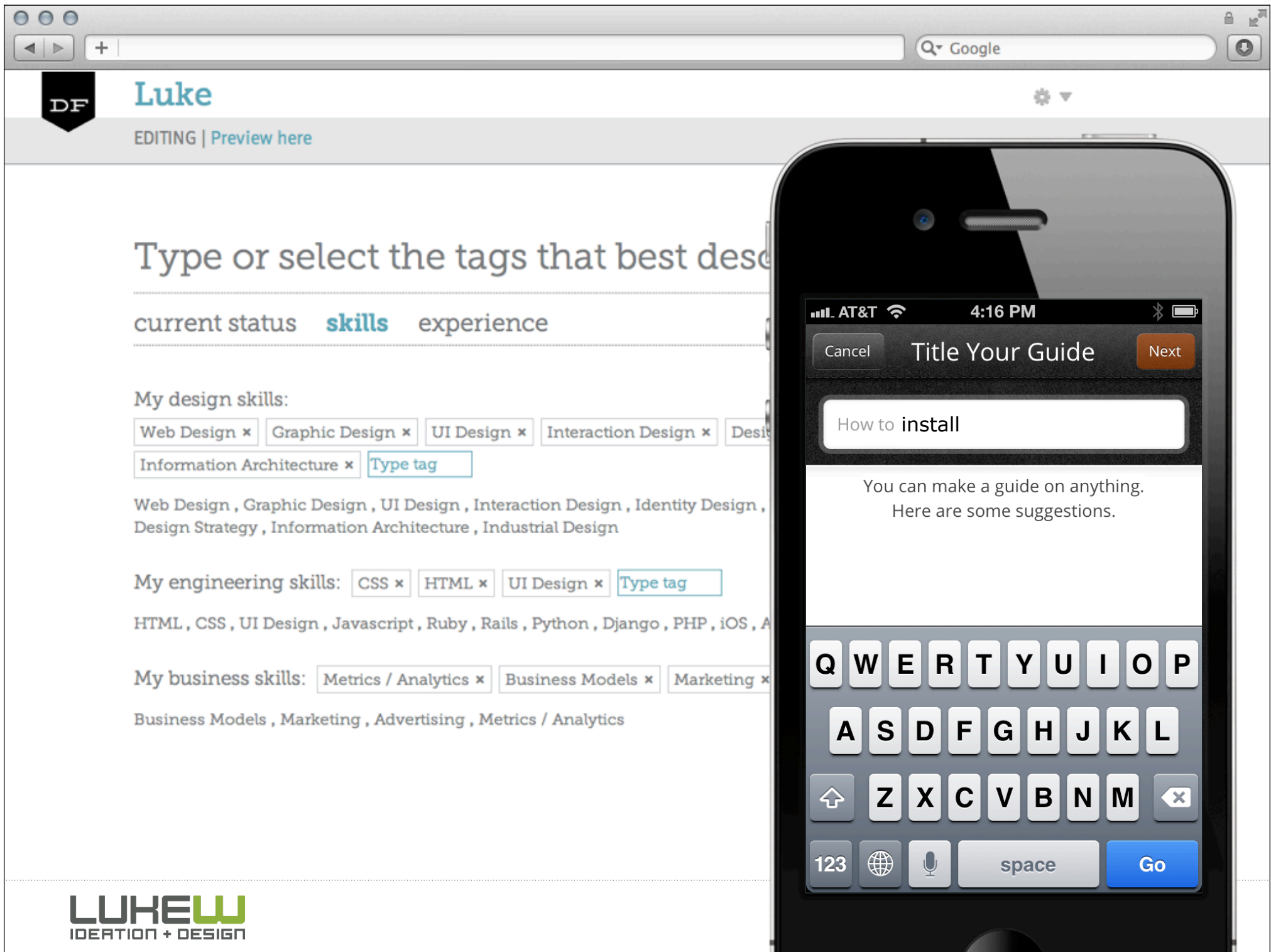
- **Touch First:** consider text fields your last option
- **Stay on Keypad:** condense UI where appropriate
- **Micro Tasks:** manage input in small pieces
- **Skip Steps:** get people into input mode asap

# Touch First



# Touch First





# MECHANICAL CONTROLS

Spinners



Switches

Tapes



Dials



# Mechanical





5:24 PM



Congratulations! Your Readability account has been created. You're moments away from saving anything you find on the web to your iPhone for reading on your terms—anytime, anywhere.

## Readability Everywhere

To get the most of Readability you can add it to all your devices and computers. Once installed, you'll be able to access or add to your reading list from anywhere. It's available for iPhone, iPad, Android, mobile Web, your favorite Web browser, Kindle,

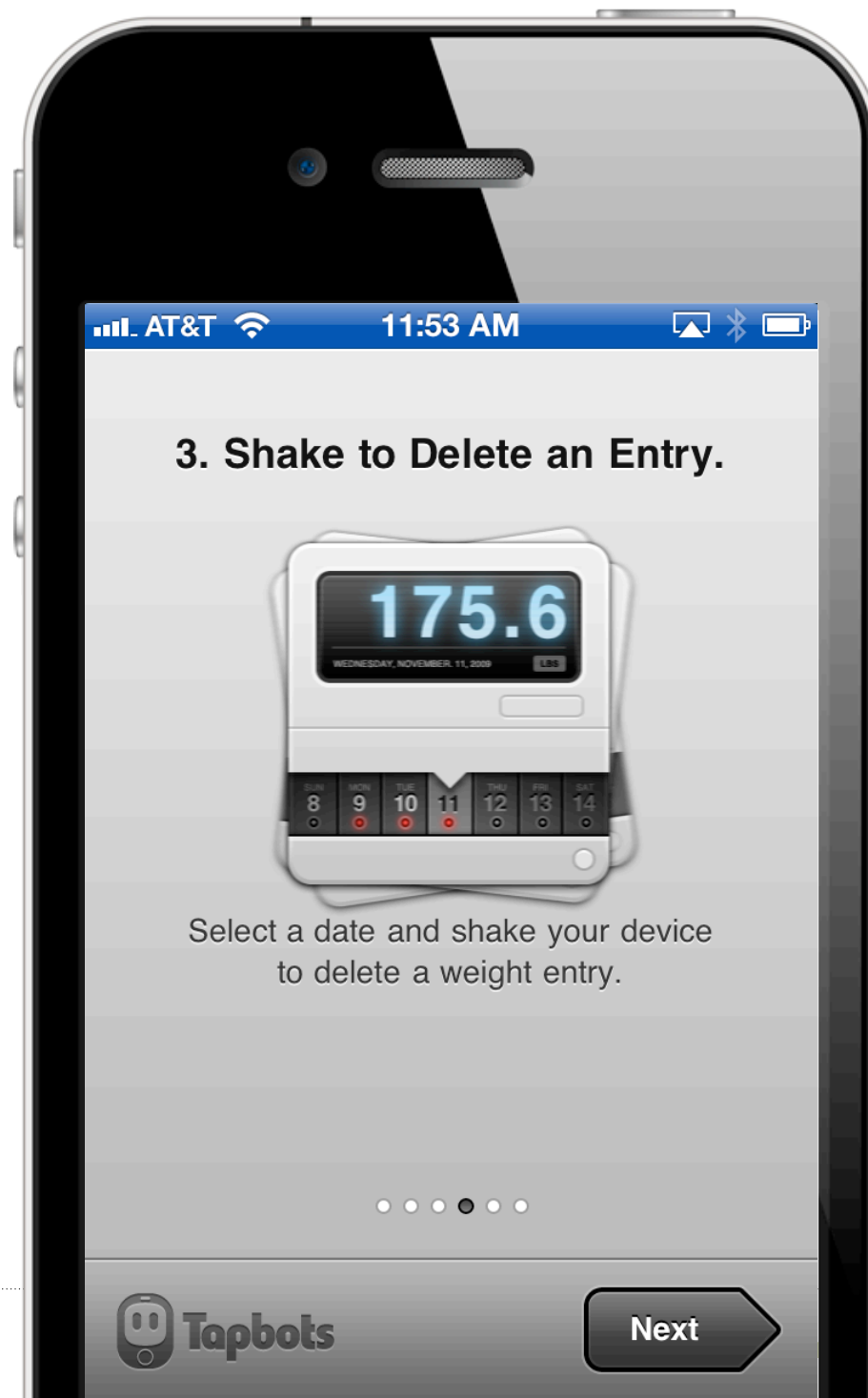
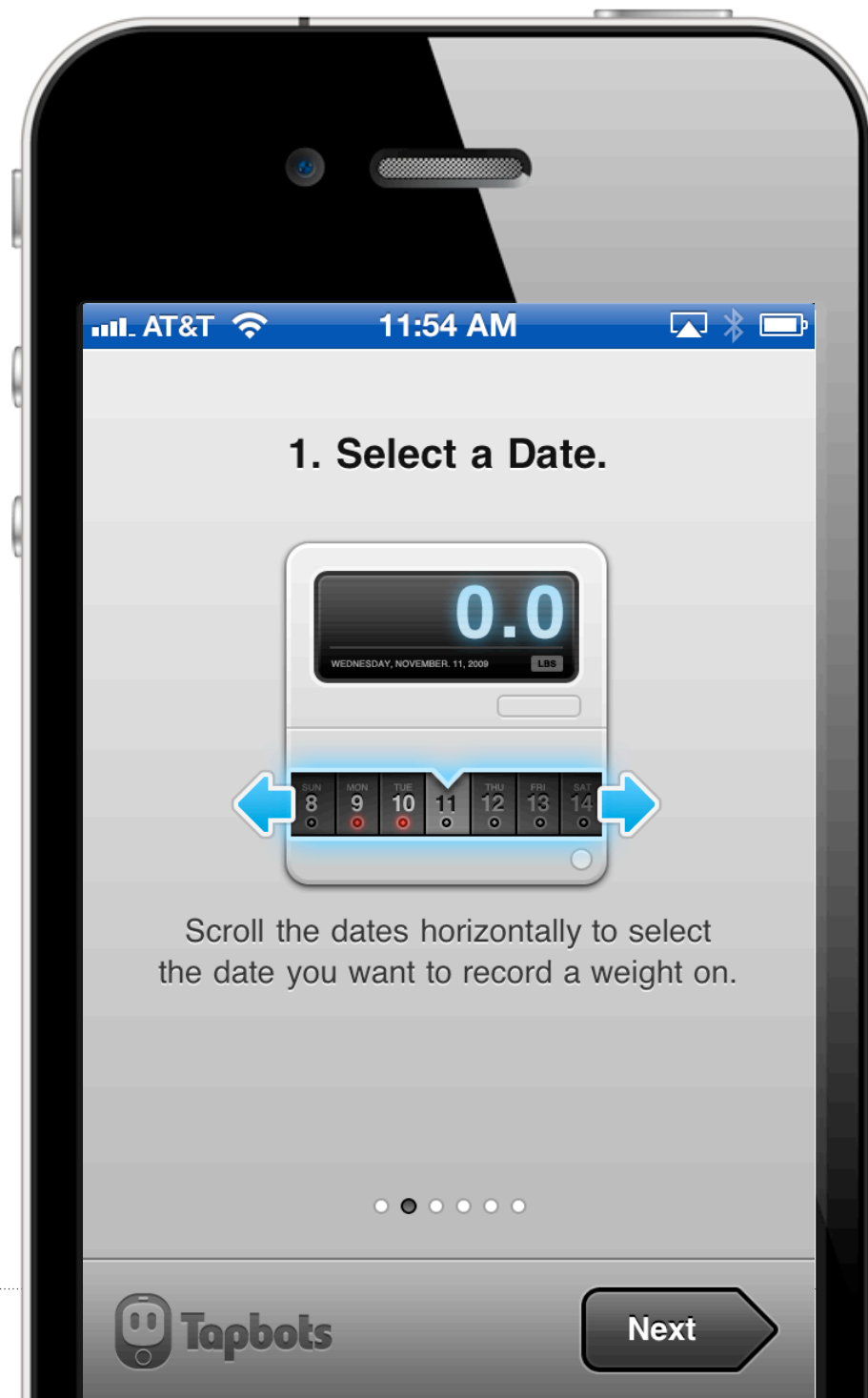


Aa

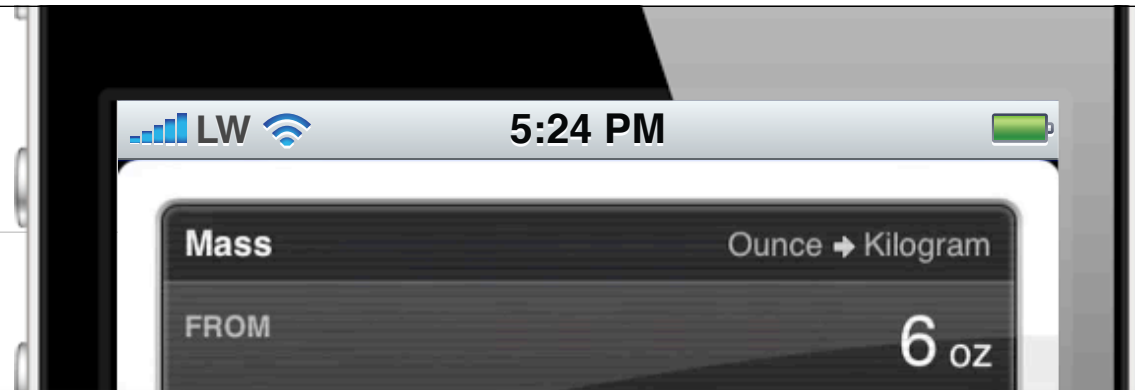


# Weightbot





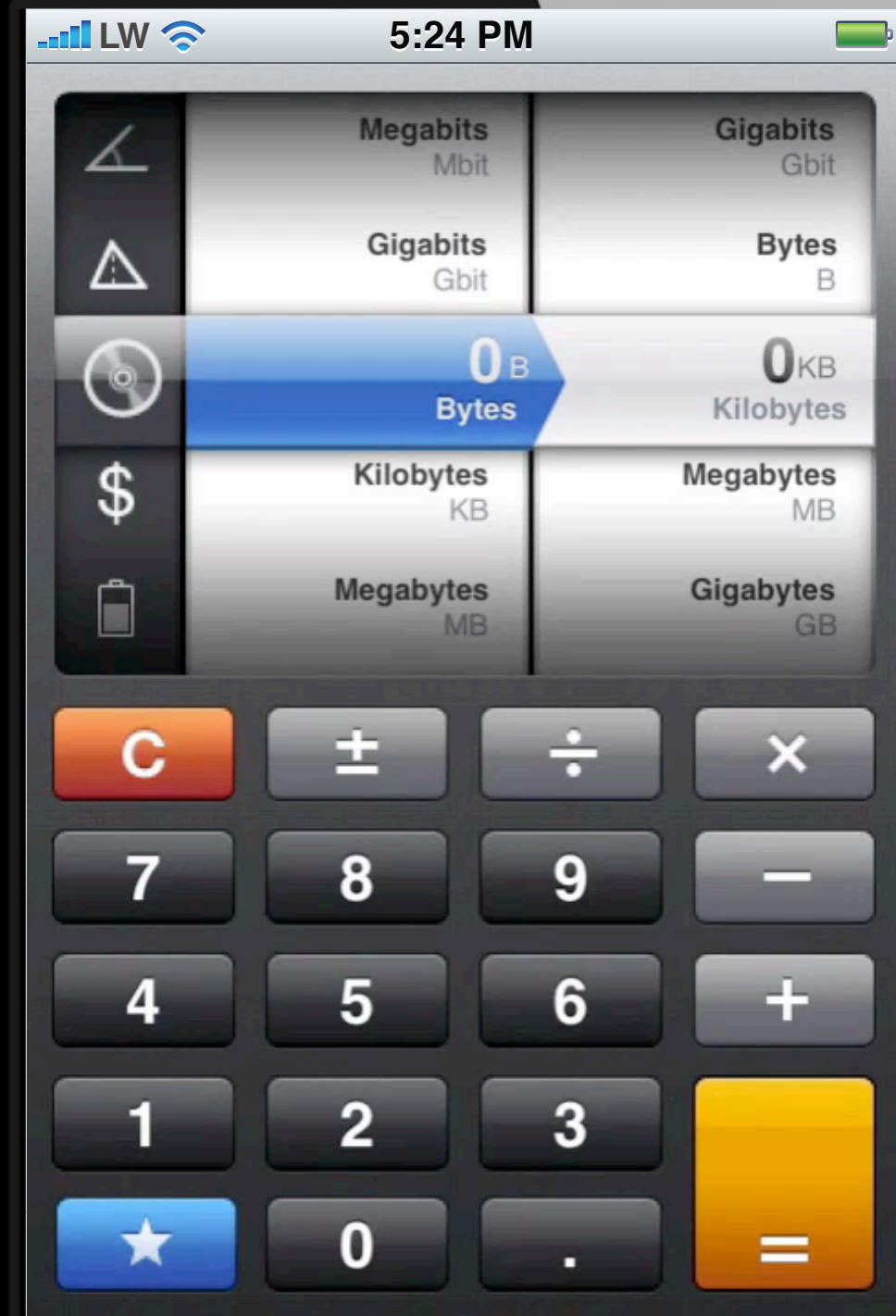
# Convertbot



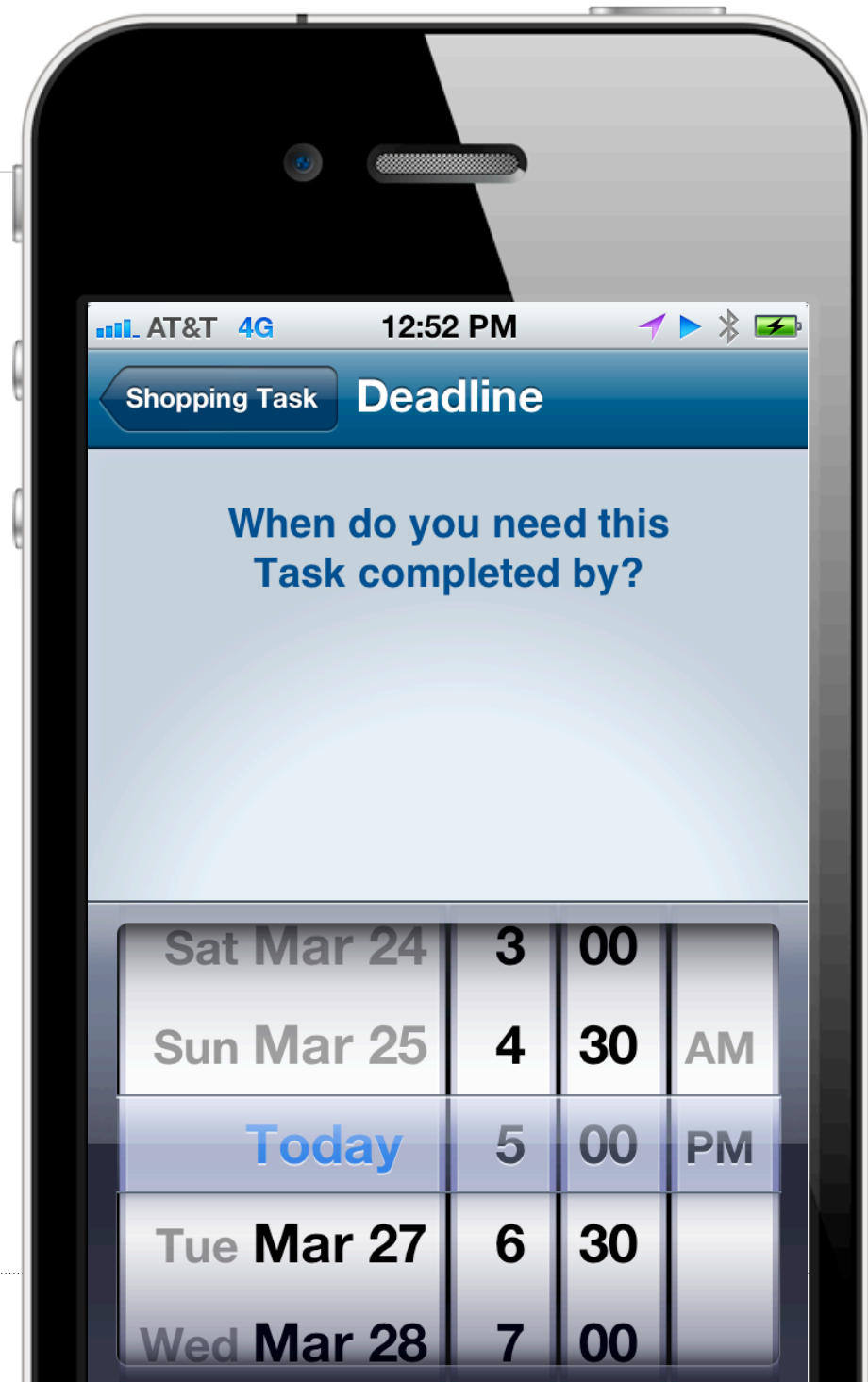
“Our primary goal wasn’t to be the most efficient unit conversion app.” -Tapbots



# Efficiency



# Custom Controls





## Native

## HTML

🍏 🤖 text field

🪟 text box

```
<input type="text">
```

---

🤖 checkbox/switch

🪟 checkbox/toggle

🍏 switch/table

```
<input type="checkbox">
```

---

🤖 radio button

🪟 radio button

🍏 segmented control/table

```
<input type="radio">
```

---

🍏 🤖 picker

🪟 list picker/box

```
<select><option>...
```



# Multi-Field Picker Menus

AT&T 9:23 PM

Enter personal profile information

Previous **Height** Next

Height 5 Feet, 7 Inches

3	5
4	6
5 Feet	7 Inches
6	8
7	9

AT&T 9:23 PM

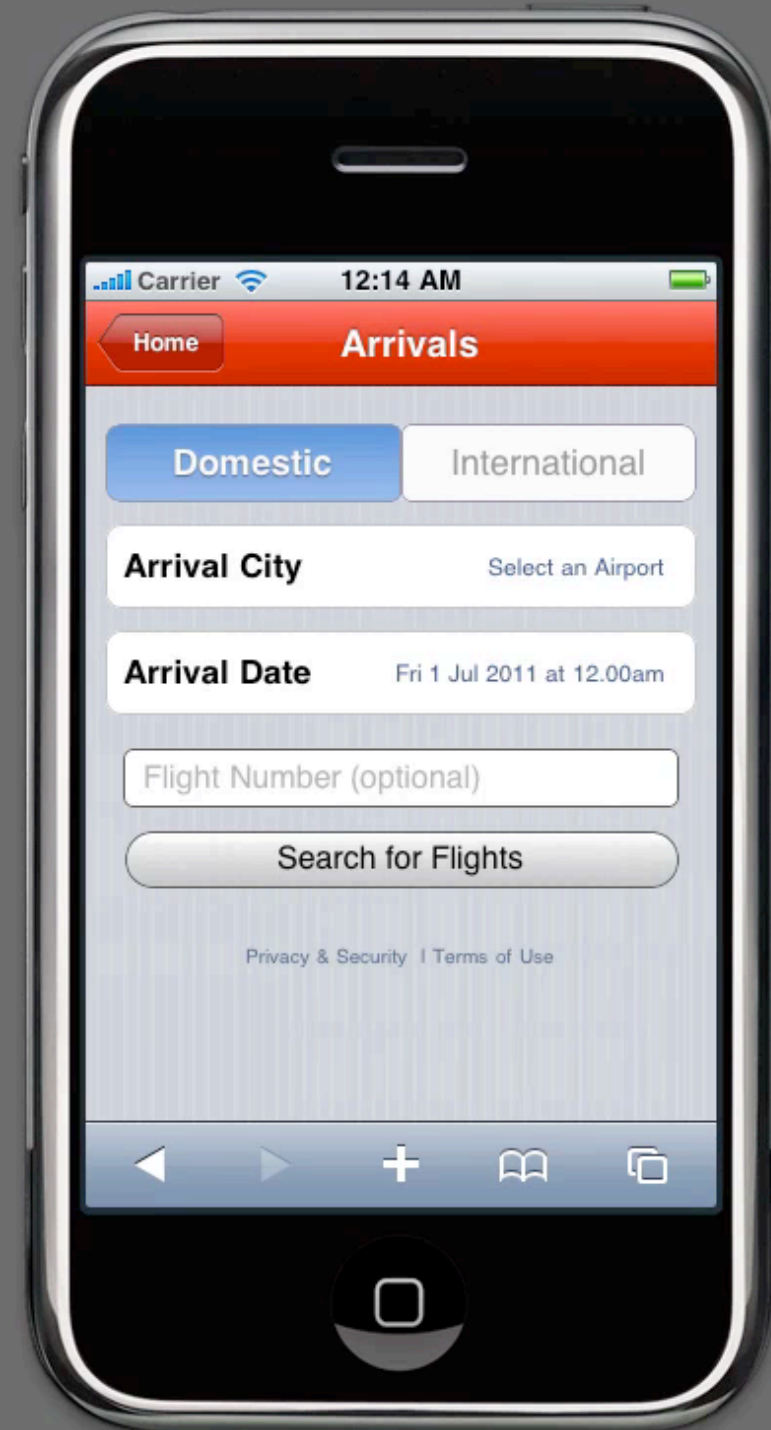
Enter personal profile information

Previous **Birthday** Next

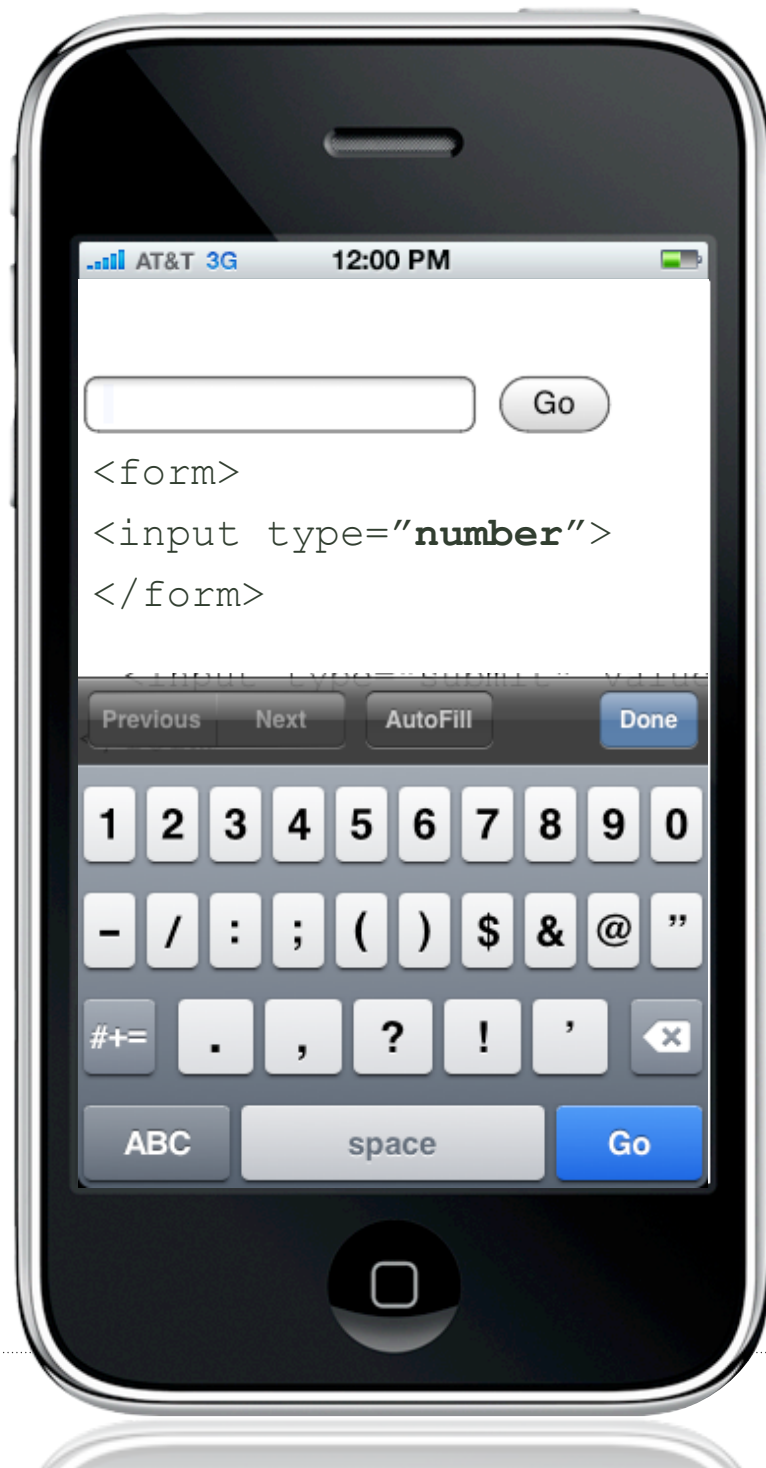
Birthday Jan 1 1975

November	30	1973
December	31	1974
January	01	1975
February	02	1976
March	03	1977

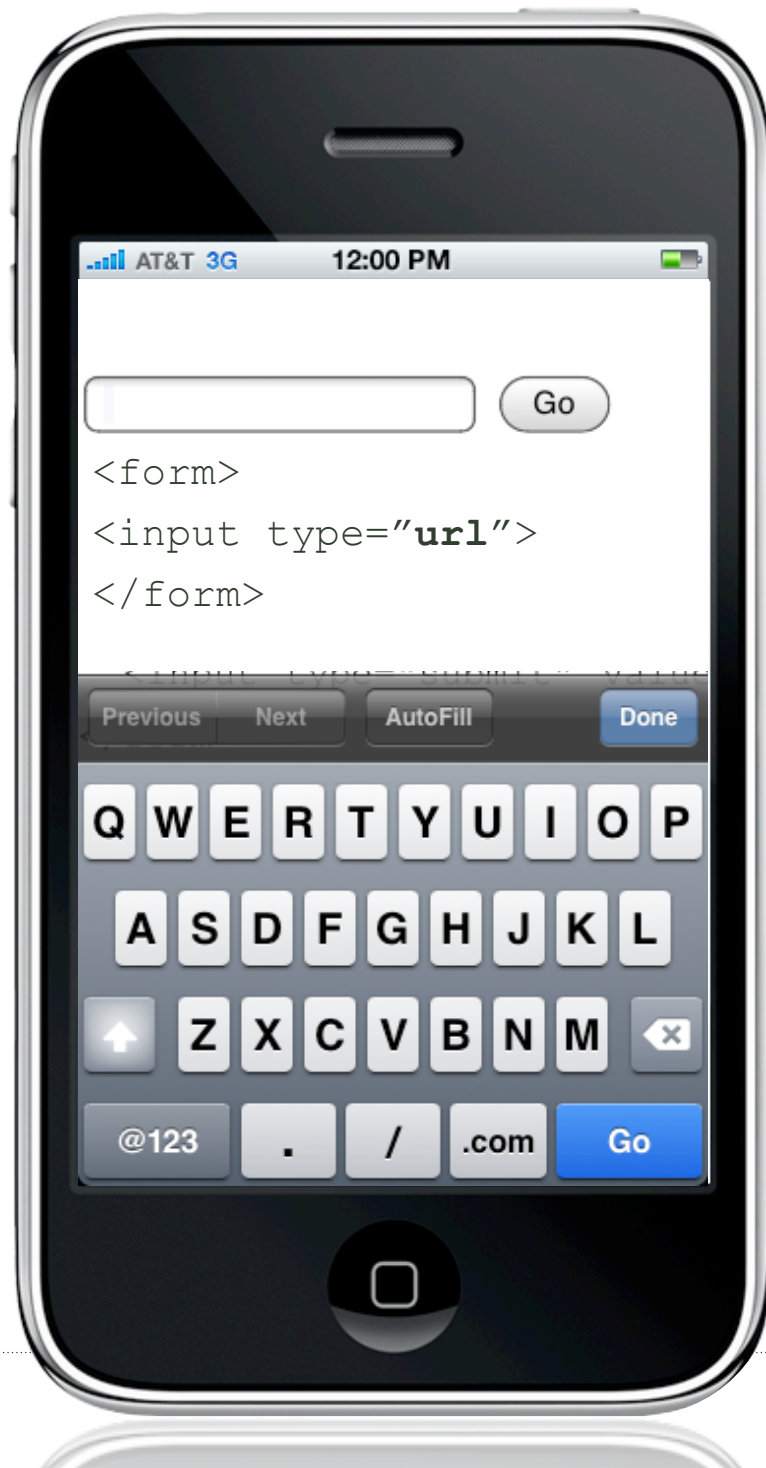
# In the Browser



Input Type	HTML
number	<code>&lt;input type="number" min="2" max="10" step="2" value="6"&gt;</code>
email	<code>&lt;input type="email"&gt;</code>
url	<code>&lt;input type="url"&gt;</code>
date	<code>&lt;input type="date"&gt;</code>
range	<code>&lt;input type="range" min="2" max="10" step="2" value="6"&gt;</code>









Available in iOS 5



Available in iOS 5

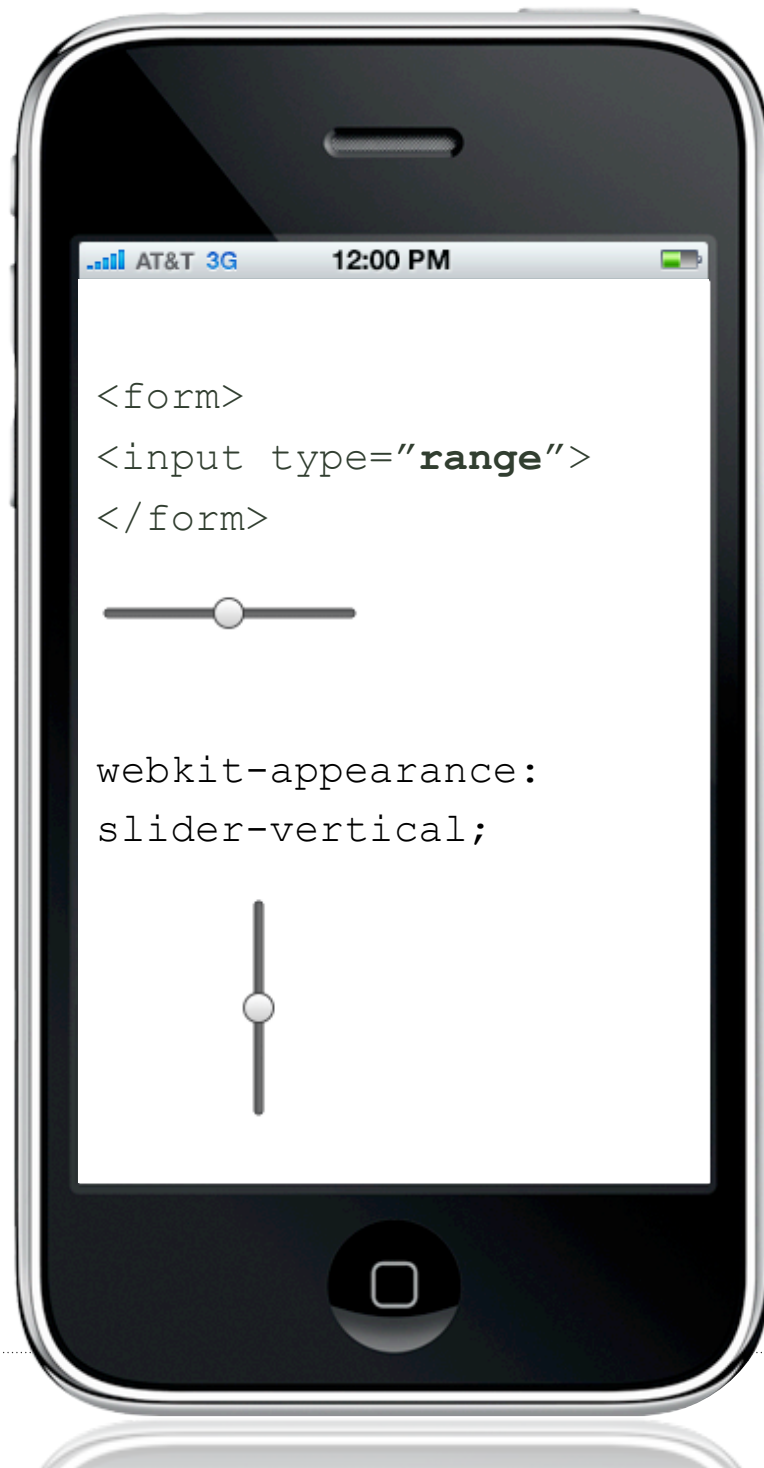




Available in iOS 5



Available in iOS 5

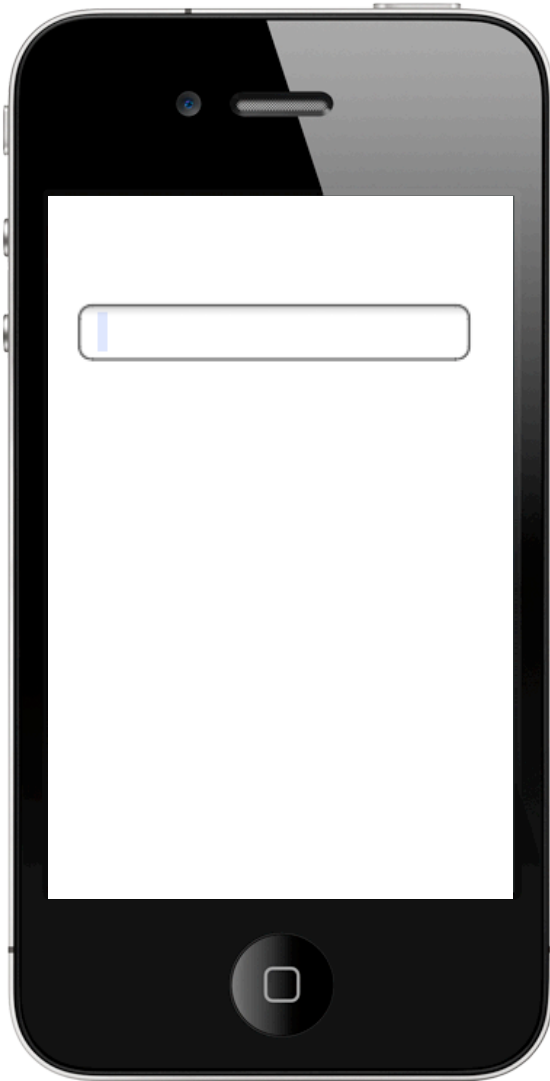


Available in iOS 5



<http://bit.ly/fdSf6T>

# text Inputs



## auto-capitalize

- Turn off on email, password, URL, and other case-sensitive inputs

## auto-correct

- Turn off on email, password, URL, and other non-alpha inputs
- Trim trailing spaces that may come from auto-correct

## Language, Mode, Format

- Specify if supported by devices

# Numerical Inputs



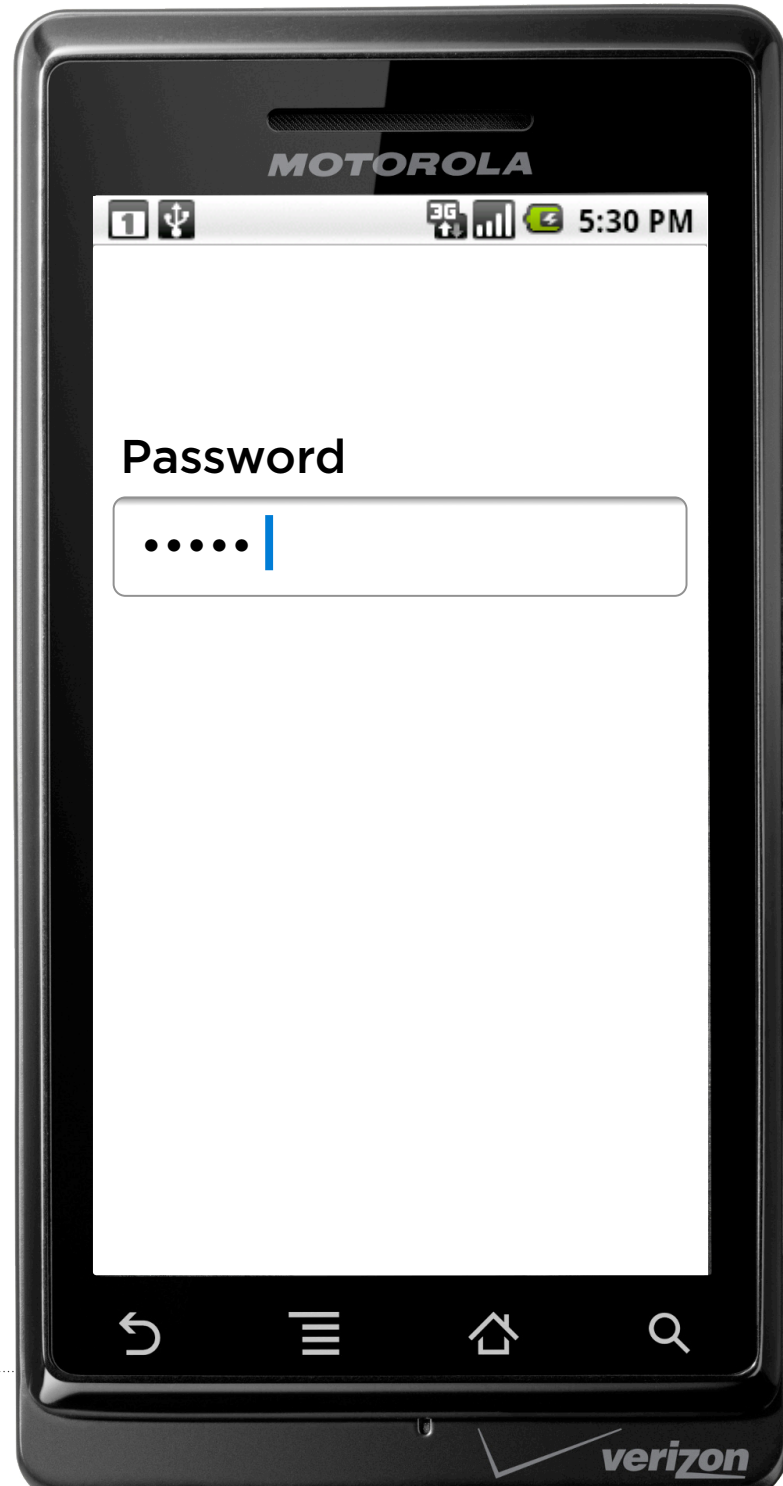
## Number Declarations

- Define input types using HTML5, Wireless CSS, or CSS-MP
- On devices without virtual keyboards, people will not have to switch into number mode

## Common Numerical Inputs

- Use a single line field for phone numbers
- Don't split up price fields (period is present on keyboards)

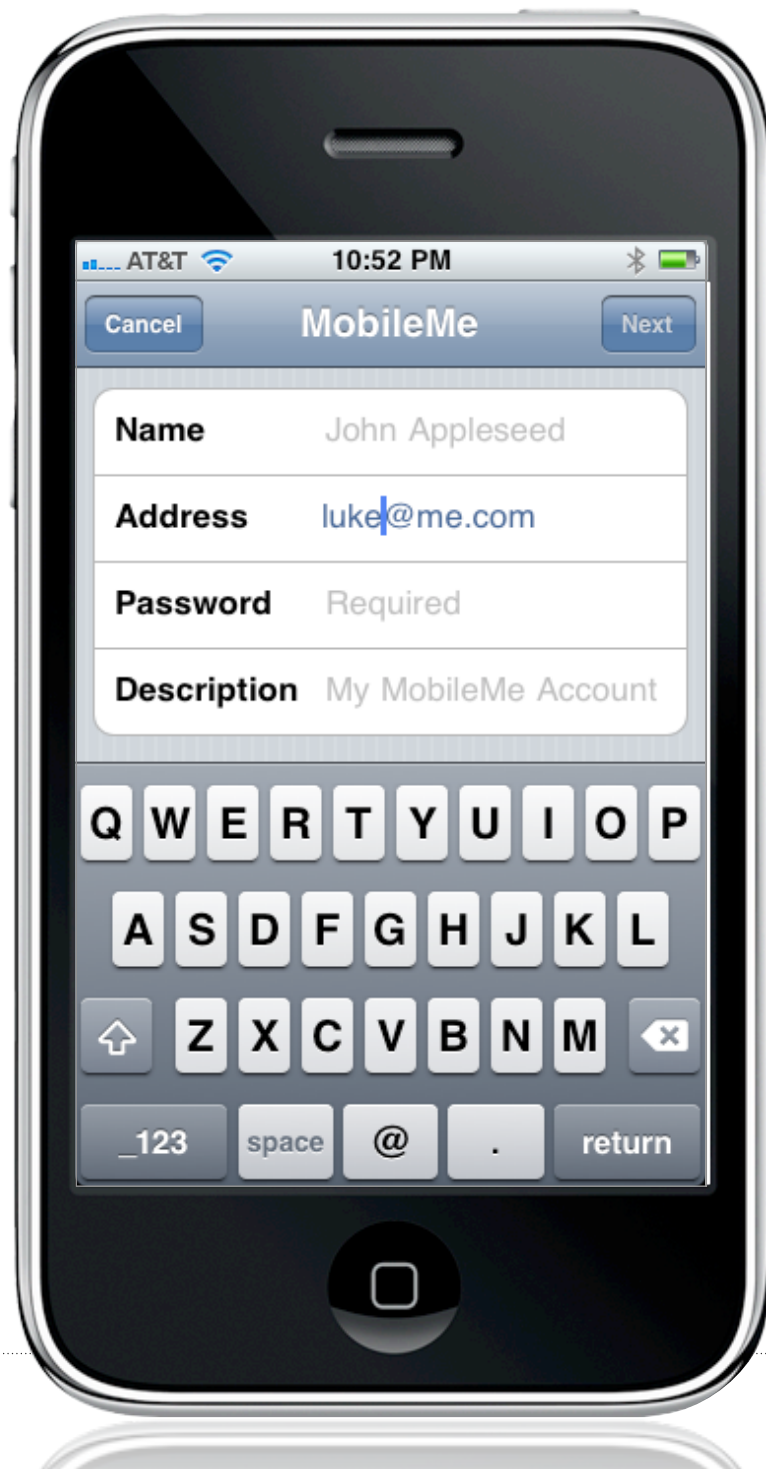
# Input Masks

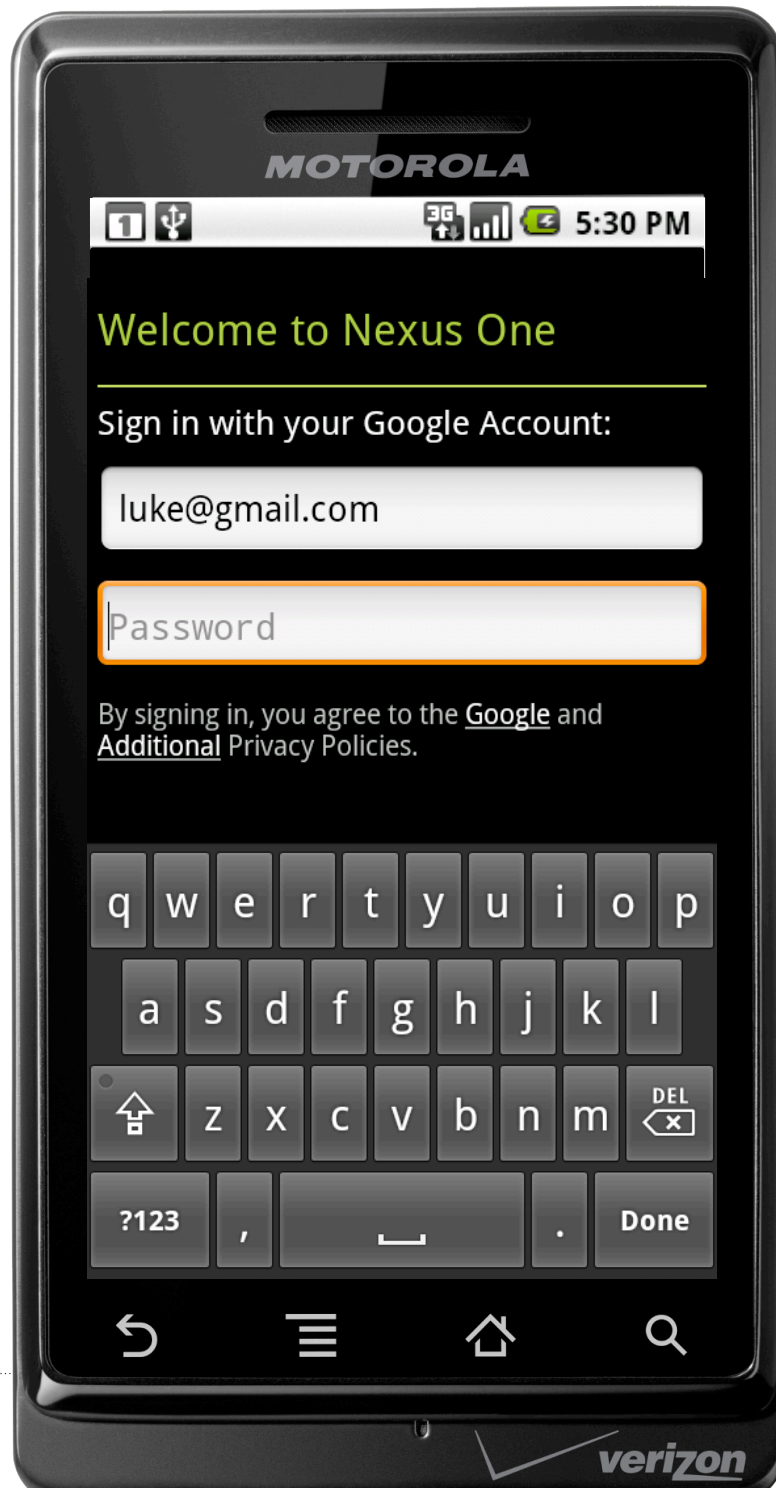


# Input Masks





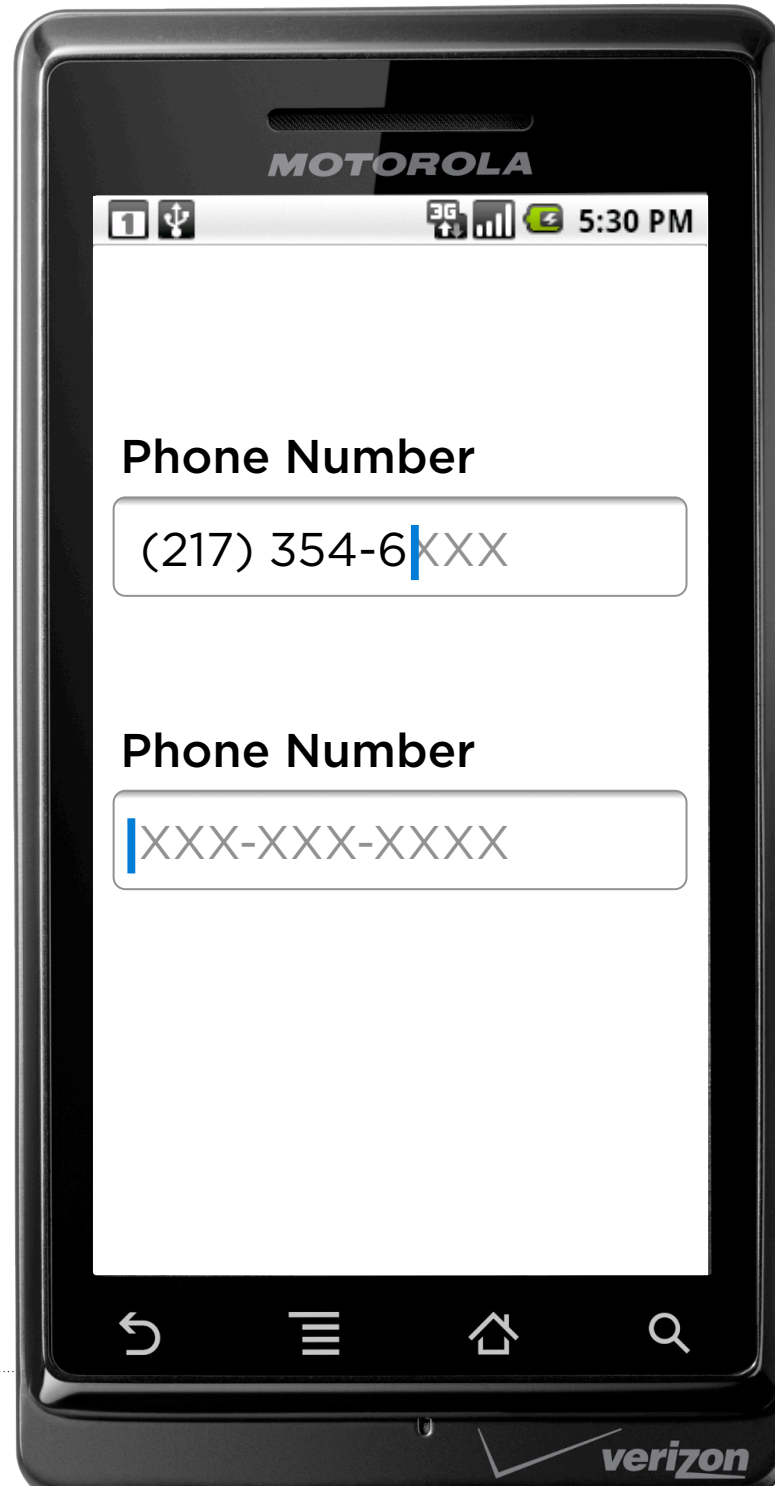




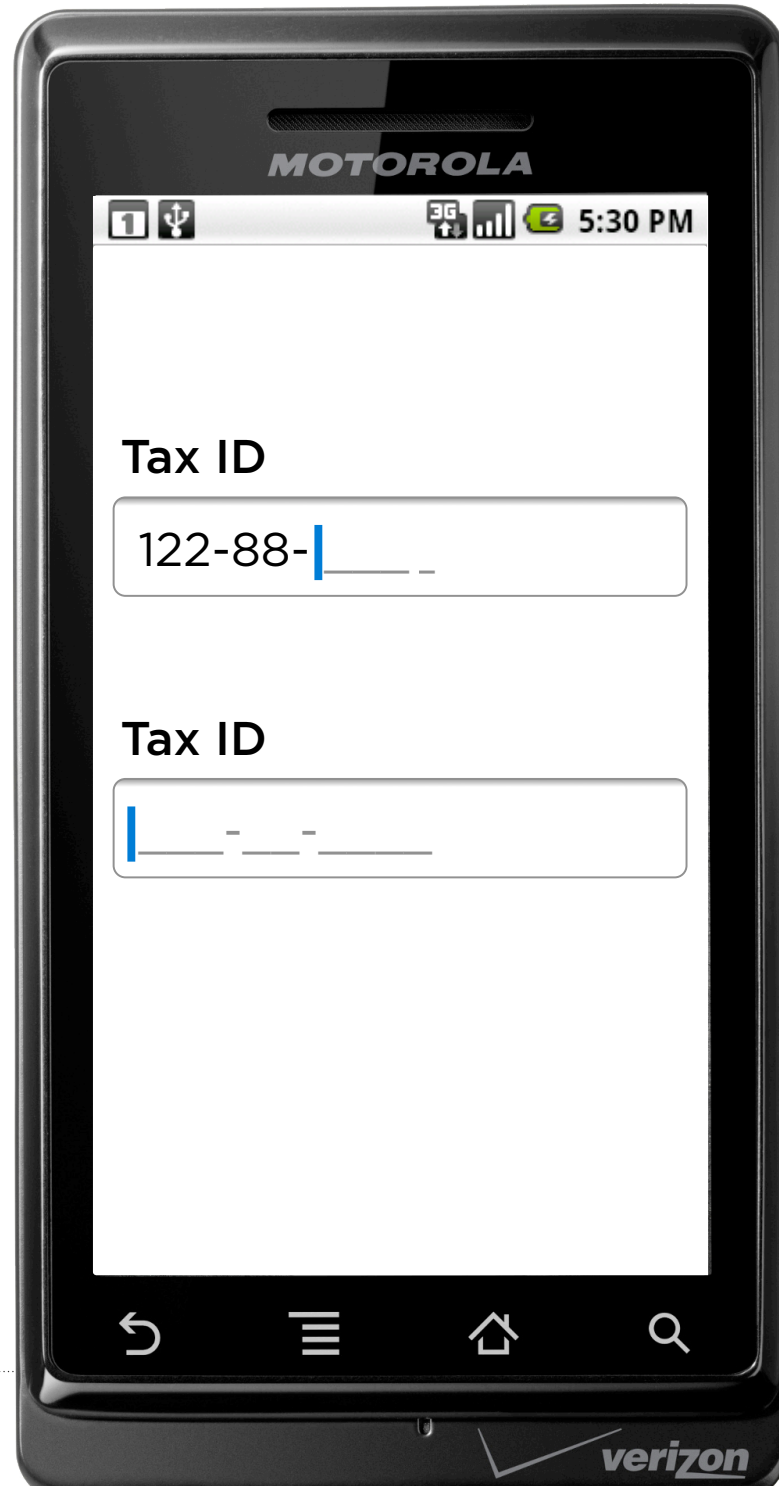
## Formatting After the Fact

Avoid the  
Gradual Reveal

Set Correct  
Expectations

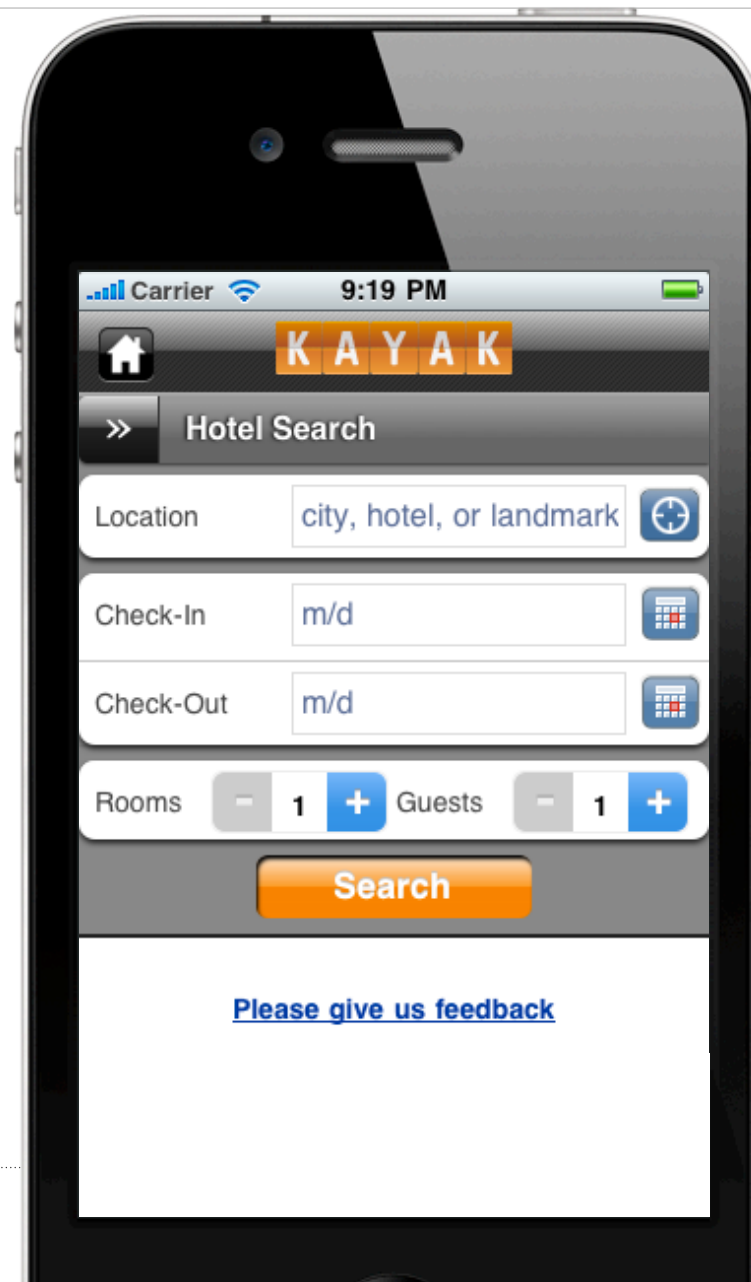


Maintain  
Format



Don't Look  
Like an Answer

# Smart Defaults



# Average Input Times

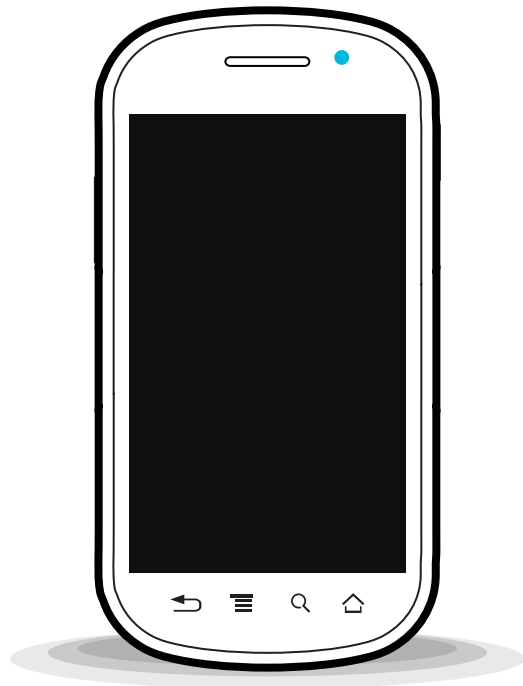
---

	Empty Forms	Pre-filled Forms
Test 1	<b>240</b> seconds	<b>60</b> seconds
Test 2	<b>170</b> seconds	<b>37</b> seconds
Test 3	<b>115</b> seconds	<b>33</b> seconds

# INPUTS

---

- Take advantage of standard input types
- Specify input types & attributes
- Consider input masks for formatting/accuracy
- Smart defaults!



## SOFTWARE

1. Constraints
2. Input fields, types, & more
3. Mobile forms

## HARDWARE

1. Capabilities
2. Rethinking forms

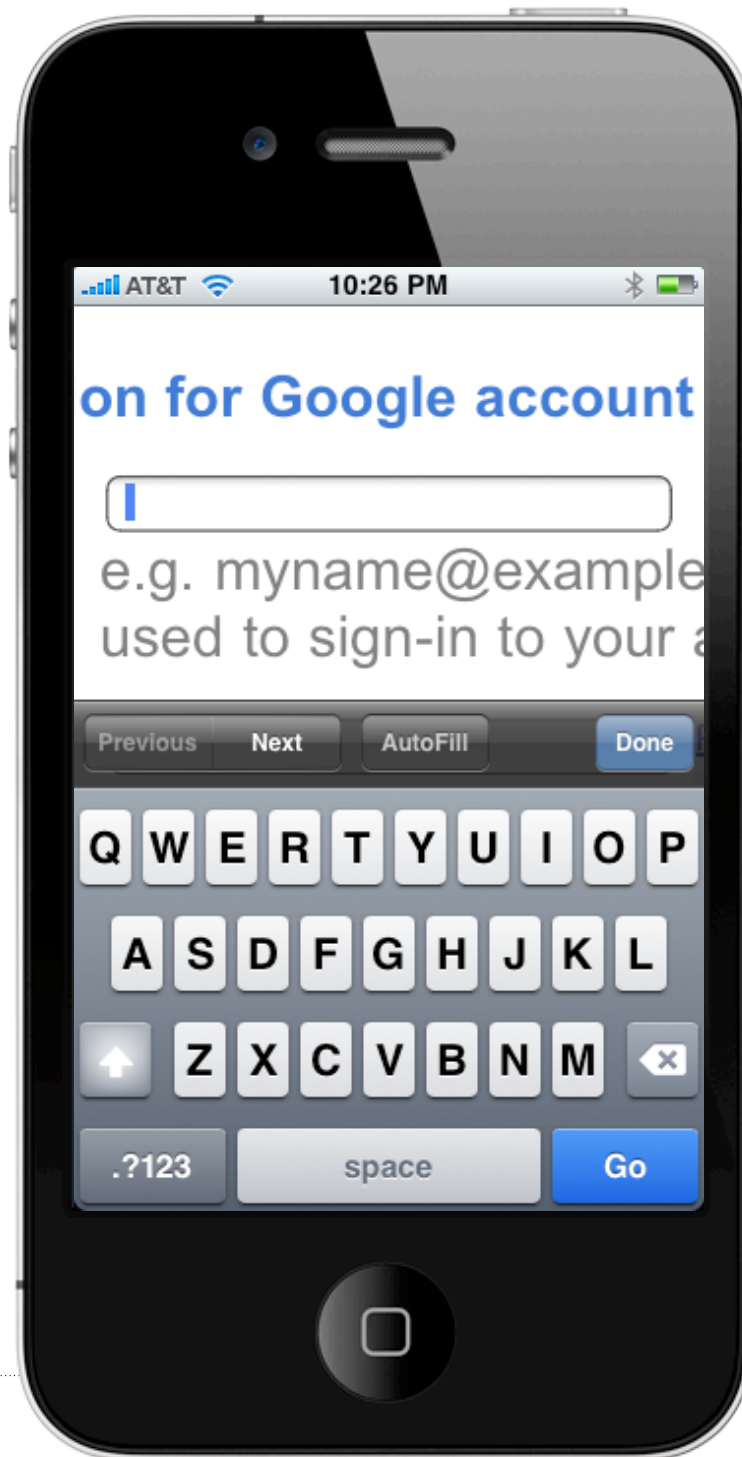


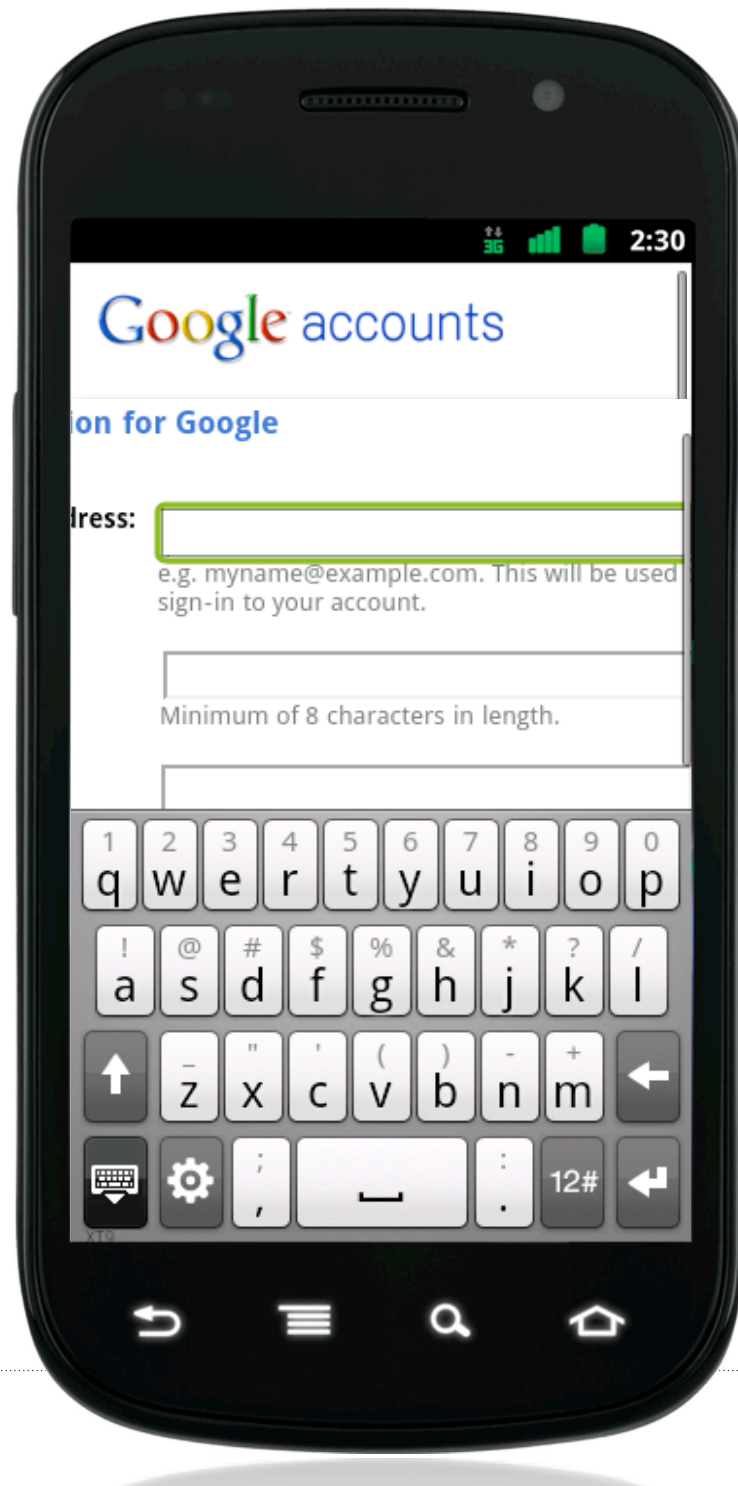
Field Zoom



Form Helper

What's the  
Question?





# Top Aligned Labels

- Minimize time to completion
- Flexibility for localization and complex inputs
- Easier to code: no floats or tables
- Accessibility: label, field in order
- Better format for mobile
- Support multiple screen resolutions
- Require more vertical space



AT&T 11:07 PM

Registration

reg.accelacomm.com/... Google

**sas** Sign-up today and get free access to this special report, Sponsored by SAS: Business Analytics Enables a Confident Enterprise

Please complete the form below and click submit. If you have submitted your information previously, enter an e-mail address only and click Submit.

\* Required

\* Email Address:

\* First Name:  \* Last Name:

\* Job Title:  \* Company:

\* City:  \* State:

\* Zip/Postal Code:  Province/Region:

\* Country:

\* Phone:

☒ Yes, I would like e-mail updates from SAS when new articles and white papers are available.

[For our privacy statement click here](#)

Navigation icons: back, forward, home, search, tabs (8)

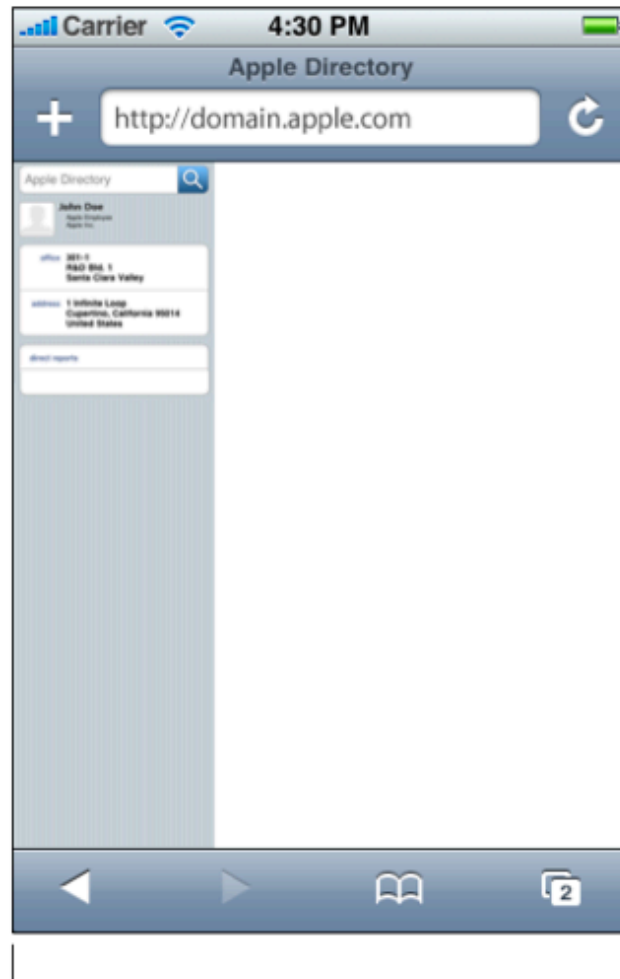




`<meta name="viewport" content="width=device-width">`

---

Default width



980 pixels



Carrier

2:41 PM

Get Online Now

boingo

Unlimited access for **24 hours is \$6.95** for all boingo locations. No monthly fees apply.





---

### Billing Information

First Name

Last Name

Credit Card Number

    are accepted

Expiration Date

09

2010

ZIP Code

 as it appears on your credit card bill

Get Online

[Cancel](#)

Carrier

2:41 PM

Get Online Now

boingo

Unlimited access for **24 hours is \$6.95** for all boingo locations. No monthly fees apply.





---

### Billing Information

First Name

Last Name

Credit Card Number

    are accepted

Expiration Date

09

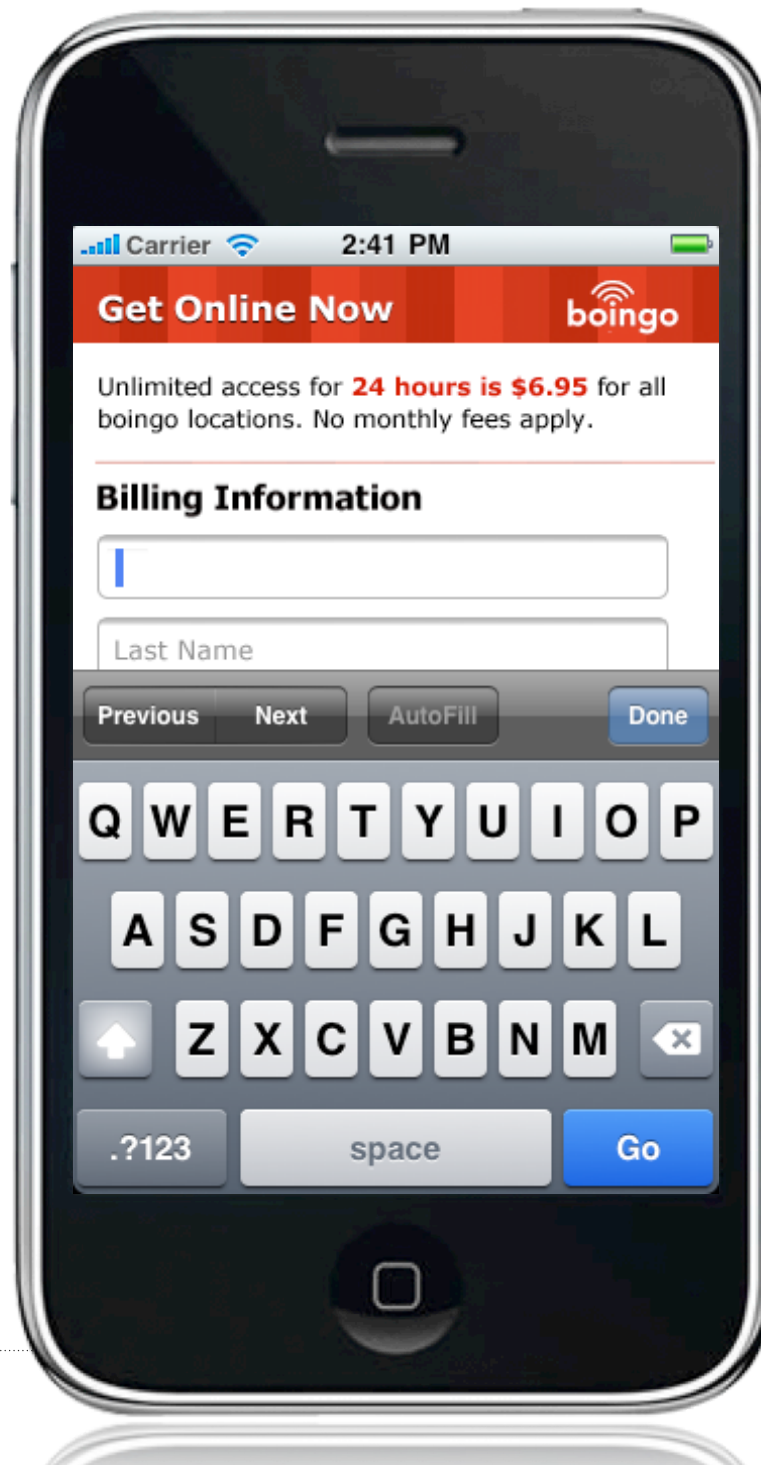
2010

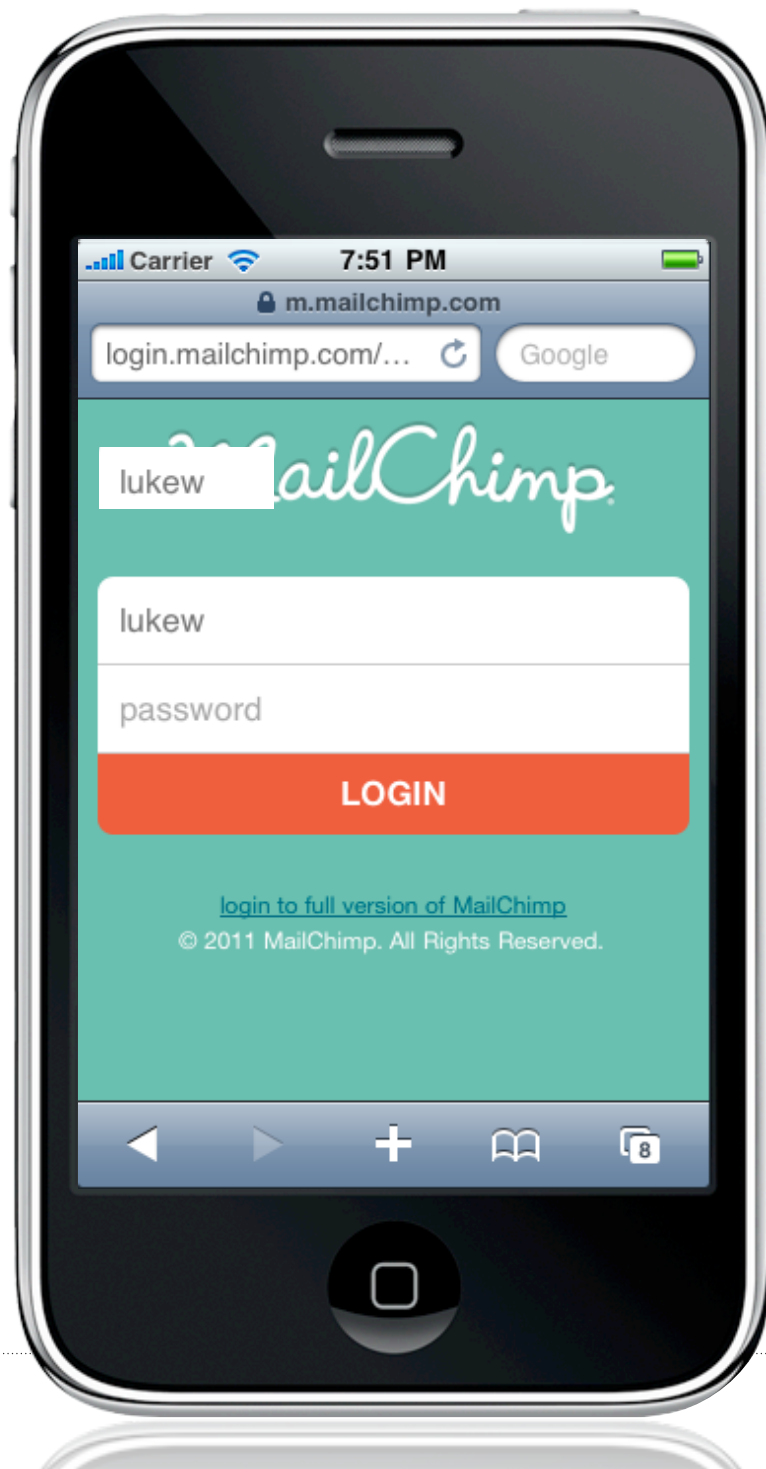
ZIP Code

 as it appears on your credit card bill

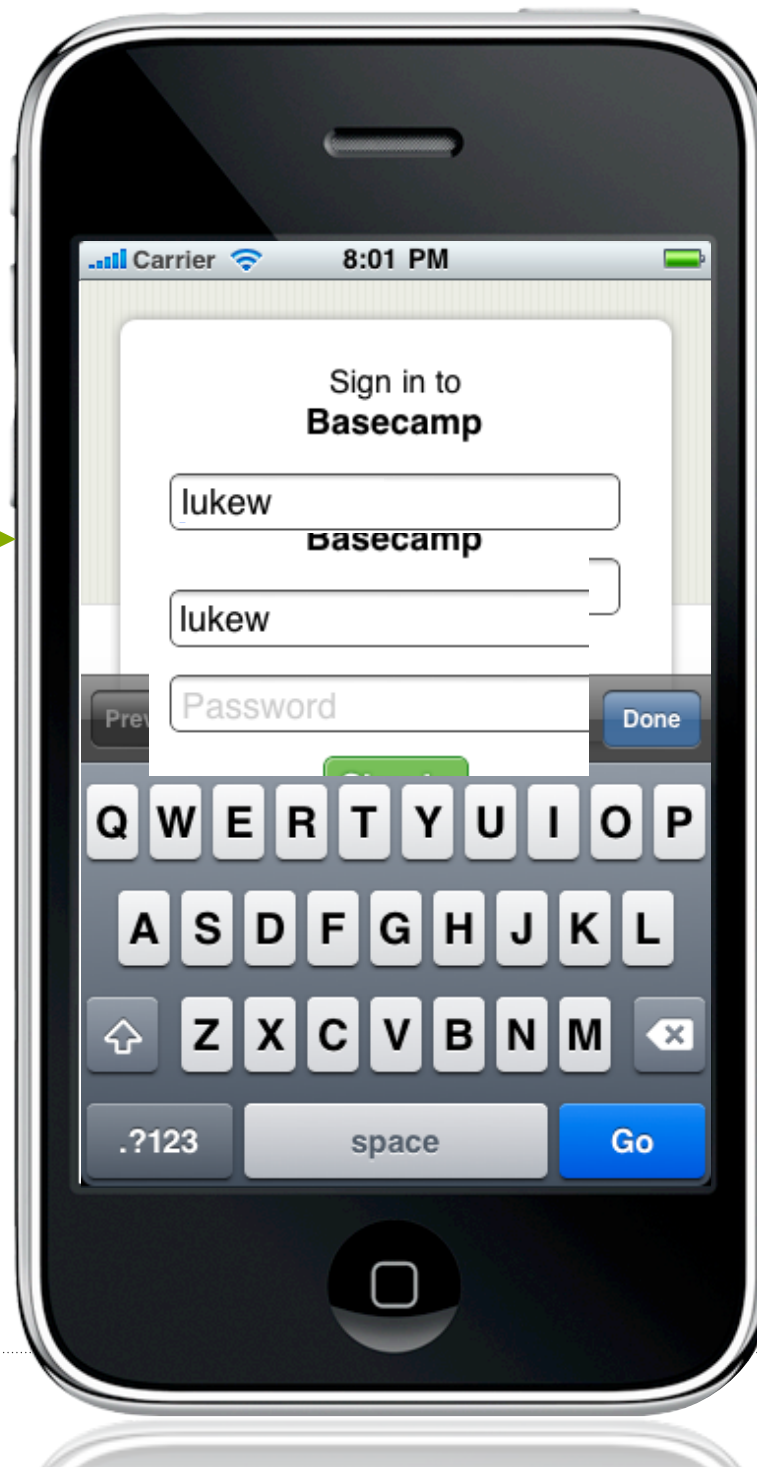
Get Online

[Cancel](#)





**PLACEHOLDER**  
Updated in iOS5



# Labels Within Inputs

Write a personal note to all the recipients you have selected.

Send Invitations

## Inbox

### Invitations

? Which invitations should you accept?

#### Join my network on LinkedIn

From: [Eckart Walther](#)

Date: February 28, 2008

To: Luke Wroblewski

Status: Accepted, Archived



Eckart Walther has indicated you are a Colleague at Yahoo!:

Write a personal note to all the recipients you have selected.

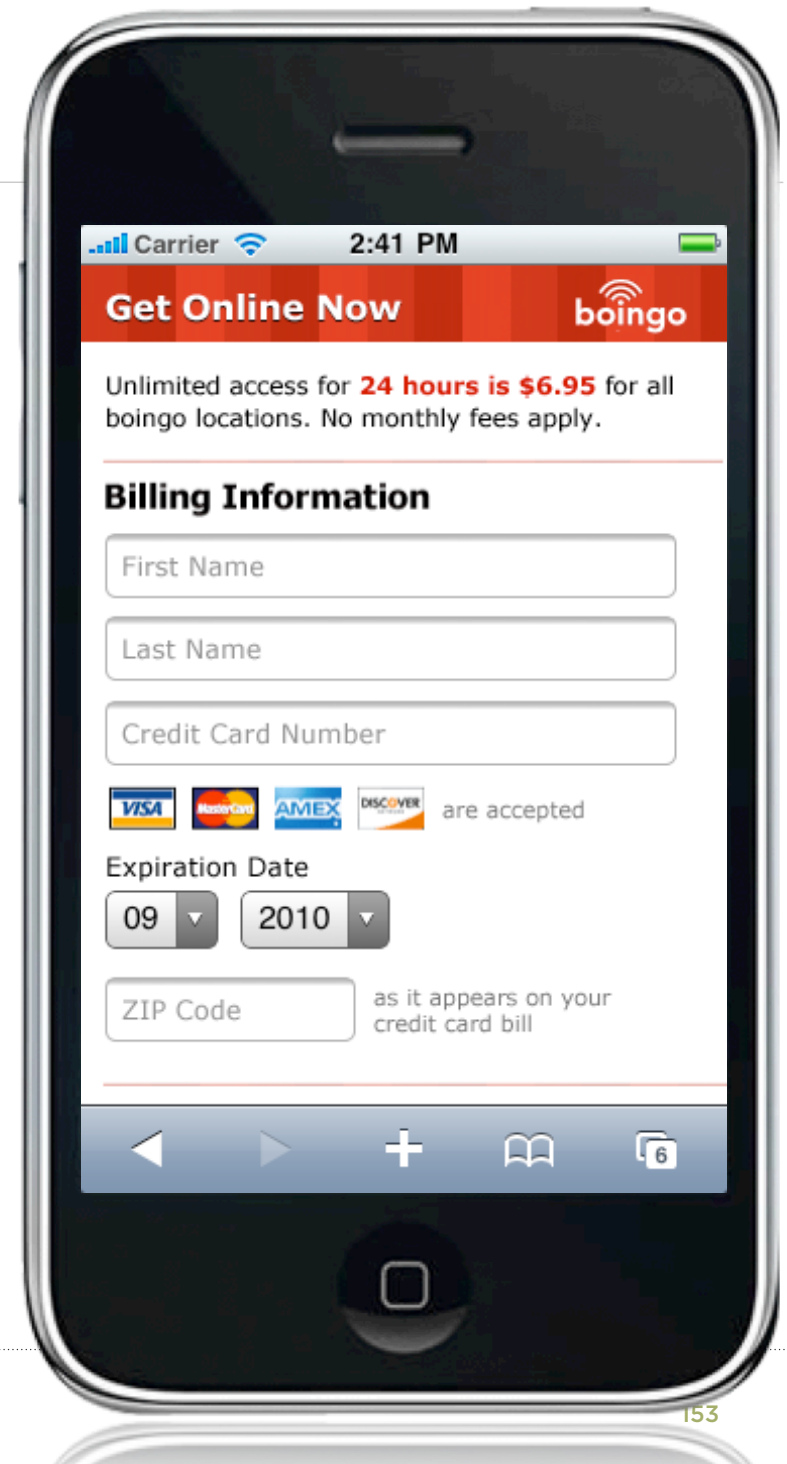
# Labels Within Inputs

---

“If you include hint text inside your form’s text boxes, many users—quite likely, the majority—will interpret the hint text as a default.”

# Labels Within Inputs

- Should never become part of someone's answer
- Should not be confused with an actual answer in an input field
- Are usually absent when someone starts answering a question and when they finish answering





## Getting Tacos

With maybe an explanation of why.

## Labels

- display static text
- name or describe parts of UI



# ios

Value 1 Cell Style	
<b>Text Label</b>	Detail text label
<b>Dahlia</b>	This is a dahlia
<b>Daisies</b>	These are daisies

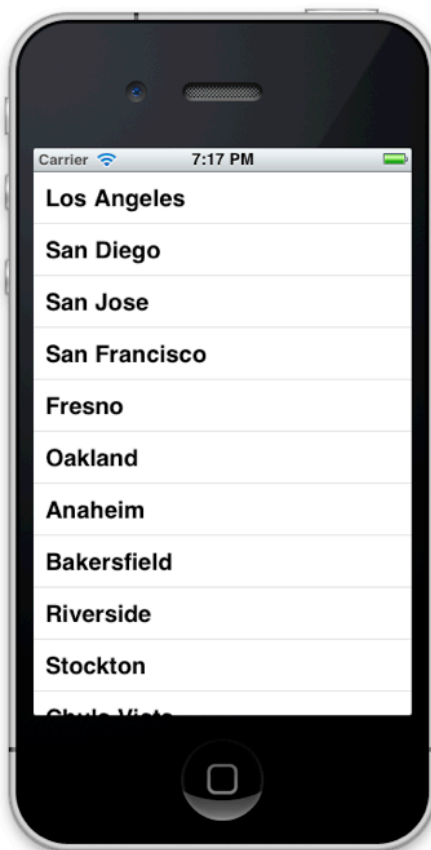
Value 1 Cell Style	
<b>Text Label</b>	Detail text label
<b>Dahlia</b>	This is a dahlia
<b>Daisies</b>	These are daisies

left or right aligned layout

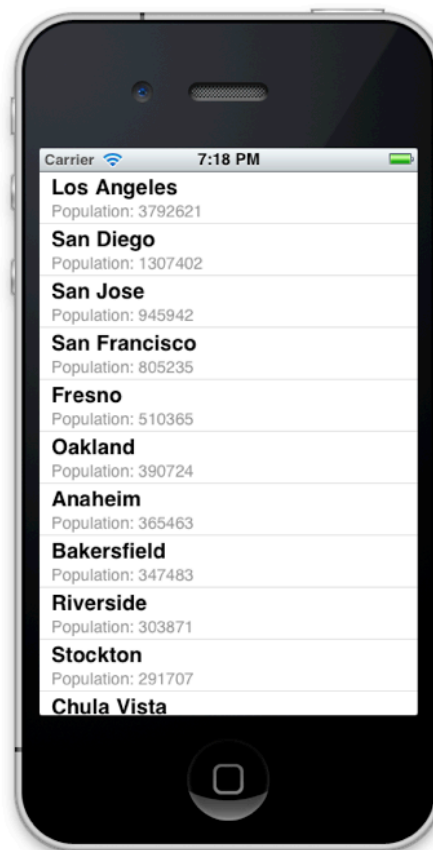
Value 2 Cell Style	
<b>Text Label</b>	Detail text label
<b>Dahlia</b>	This is a dahlia
<b>Daisies</b>	These are daisies

Value 2 Cell Style	
<b>Text Label</b>	Detail text label
<b>Dahlia</b>	This is a dahlia
<b>Daisies</b>	These are daisies

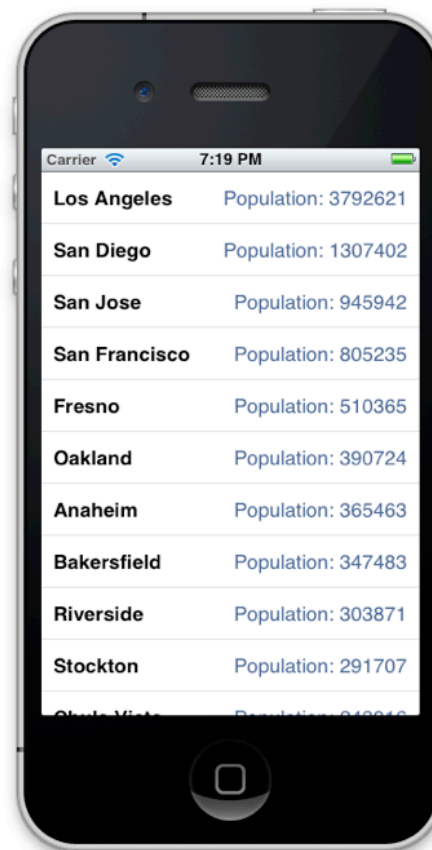
# ios



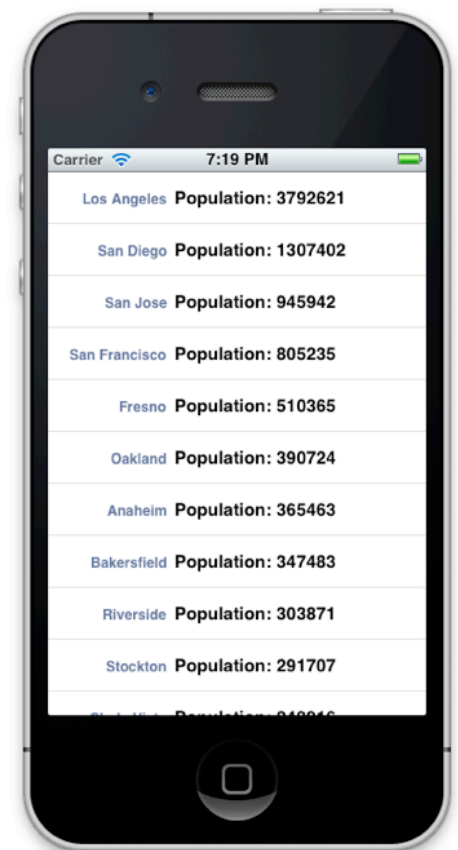
UITableViewCellStyleDefault



UITableViewCellStyleSubtitle



UITableViewCellStyleValue1



UITableViewCellStyleValue2



#### SINGLE LINE LIST <sup>1</sup>

List item number one

Second list item

This is the third item

#### 2 LINE LIST

##### 2-Line List

Austin mixtape cosby sweater butcher. Fixie ad vice, brooklyn...



##### Second list item

Assumenda commodo laborum accusamu

2



#### 3 LINE LIST

##### Three line list title

Put a bird on it qui fanny pack, portland irony nisi fap irure.  
Donec hendrerit elit nec ligula dapibus

##### Second row in list

Vinyl laboris lo-fi ethical, adipisicing assumenda beard.  
Curabitur gravida quam id orci sodales

single-line items, multi-line items, and custom items with icons, checkboxes, and action buttons.



TITLE

untitled untitled

Text example

Text example showing a  
wrapping behavior

Text example showing

Text example showing  
wrapping behavior

Text example showing

Text example showing

**LIST VIEW**

Showing a single line list with wrapping

TITLE

untitled untitled

Text example

Lorem ipsum dolor

Text example showing

Lorem ipsum dolor sit amet, consectetur adipiscing

Text example showing  
wrapping behavior

Lorem ipsum dolor sit amet, consectetur adipiscing

Text example showing

Lorem ipsum dolor sit amet, consectetur adipiscing

Text example

Lorem ipsum dolor sit amet, consectetur

Text example

Lorem ipsum dolor sit amet, consectetur

**LIST VIEW**

Showing a double line list with wrapping

TITLE

untitled untitled

Text example

Lorem ipsum dolor  
Ut enim ad mir

Text example

Lorem ipsum dolor  
Ut enim ad mir

Text example

Lorem ipsum dolor  
Ut enim ad mir

Text example

Lorem ipsum dolor  
Ut enim ad mir

Text example

Lorem ipsum dolor  
Ut enim ad mir

**LIST VIEW**

Showing a triple line list with wrapping

# Form Structures

---

1. Sequential
2. Non-linear
3. In-context

SHIP TO:



Full Name

Address

Signature required for delivery.

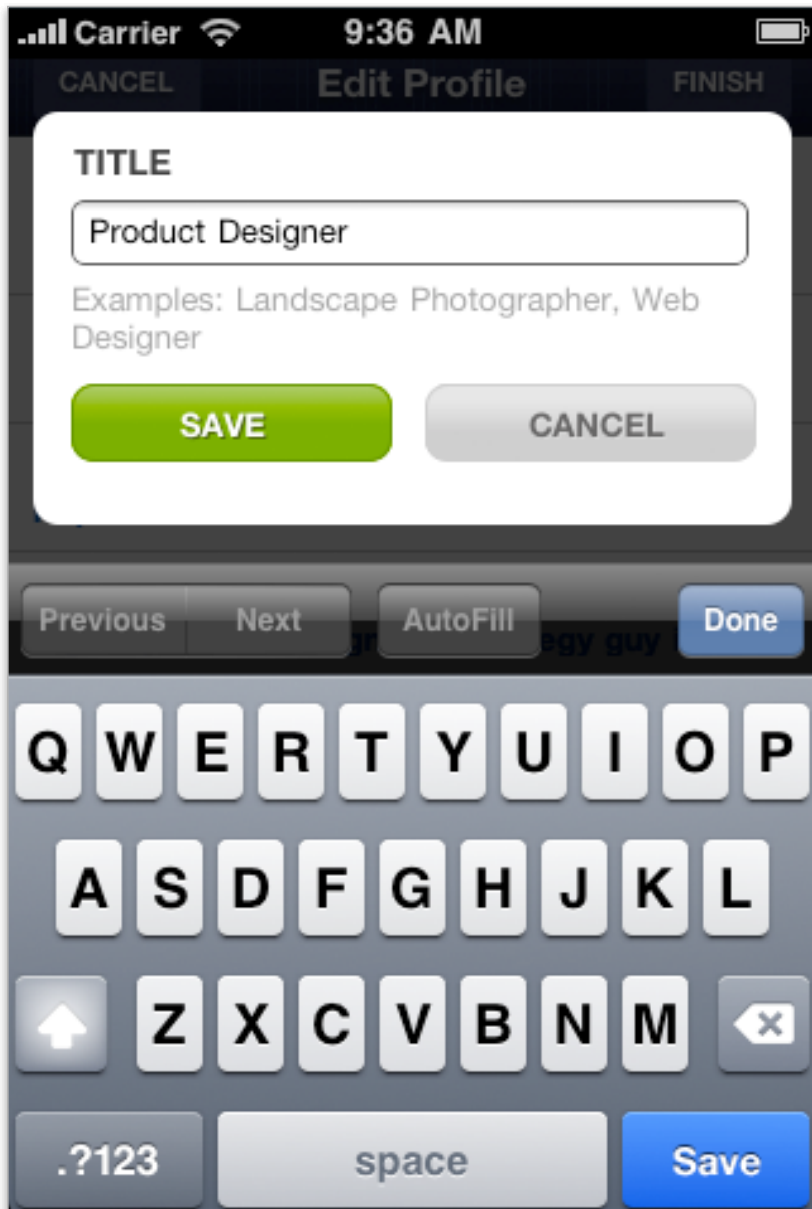
City

State

ZIP Code

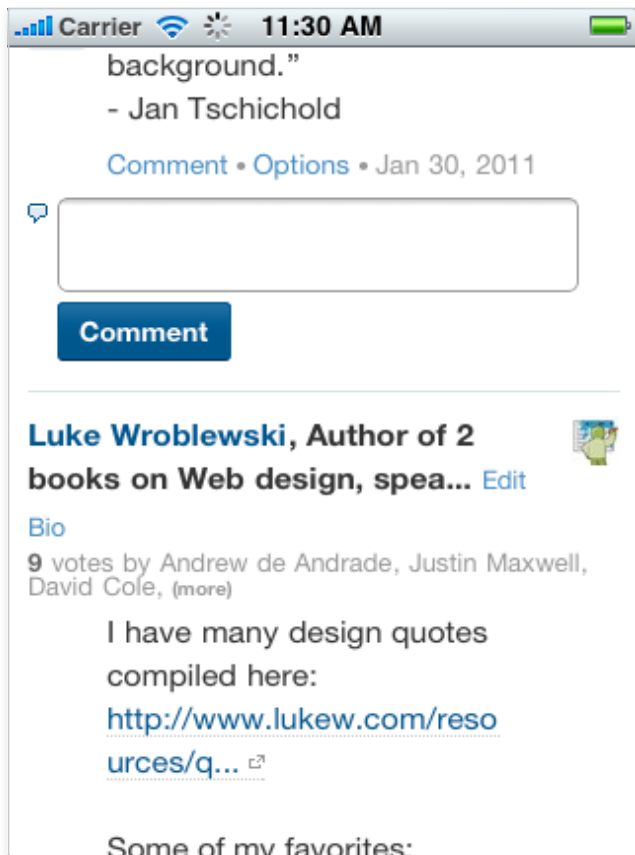
## Sequential

- Group(s) of questions that have to be asked together in order to complete a task
- Anything that requires answers before accomplishing a goal
- Examples: registration, checkout



## Non-Linear

- Only some inputs (in a bigger set) need to be updated or adjusted
- Exposing input fields for every possible answer makes it hard to find the one or two inputs you need
- Each possible input can be tapped and edited in a separate screen



## In-Context

- Provide a way for people to quickly contribute or create without a lot of effort.
- Show up directly inline where people can contribute
- Usually only consists of a single input field
- Enables immediate contributions and aligns with the short bursty way people use mobile



# MOBILE FORMS

---

- Use top-aligned labels & single column layouts
- Labels within input fields need more care
- Apply appropriate structures: sequential, non-linear, in-context

# FORMS

Me: Log In

Us: Checkout

You: Exercise

# LOGIN



15

authentications  
per day

82%

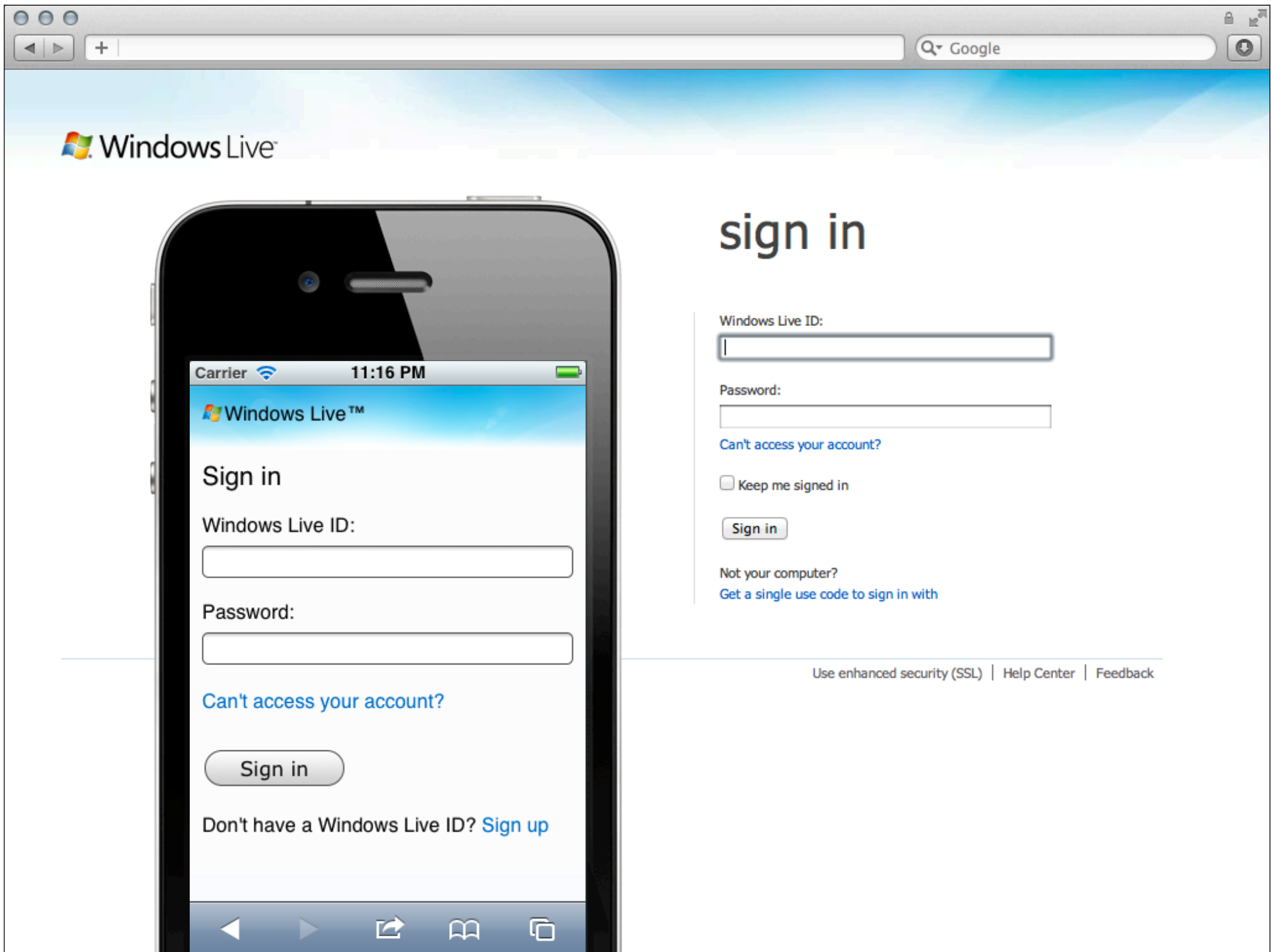
have forgotten a  
site password

5-10%

request password

#1

request to  
intranet help desk



Windows Live™

## sign in

Windows Live ID:

Password:

[Can't access your account?](#)

☐ Keep me signed in

Sign in

Not your computer?

[Get a single use code to sign in with](#)

[Use enhanced security \(SSL\)](#) | [Help Center](#) | [Feedback](#)

Carrier 11:16 PM

Windows Live™

## Sign in

Windows Live ID:

Password:

[Can't access your account?](#)

Sign in

Don't have a Windows Live ID? [Sign up](#)



eBay Buyer Protection [Learn more](#)

## Welcome to eBay - Sign in

Sign in to your account [?](#)

User ID

Password

[I forgot my user ID or password](#)

I forgot my [user ID](#) or [password](#)

**Sign in**

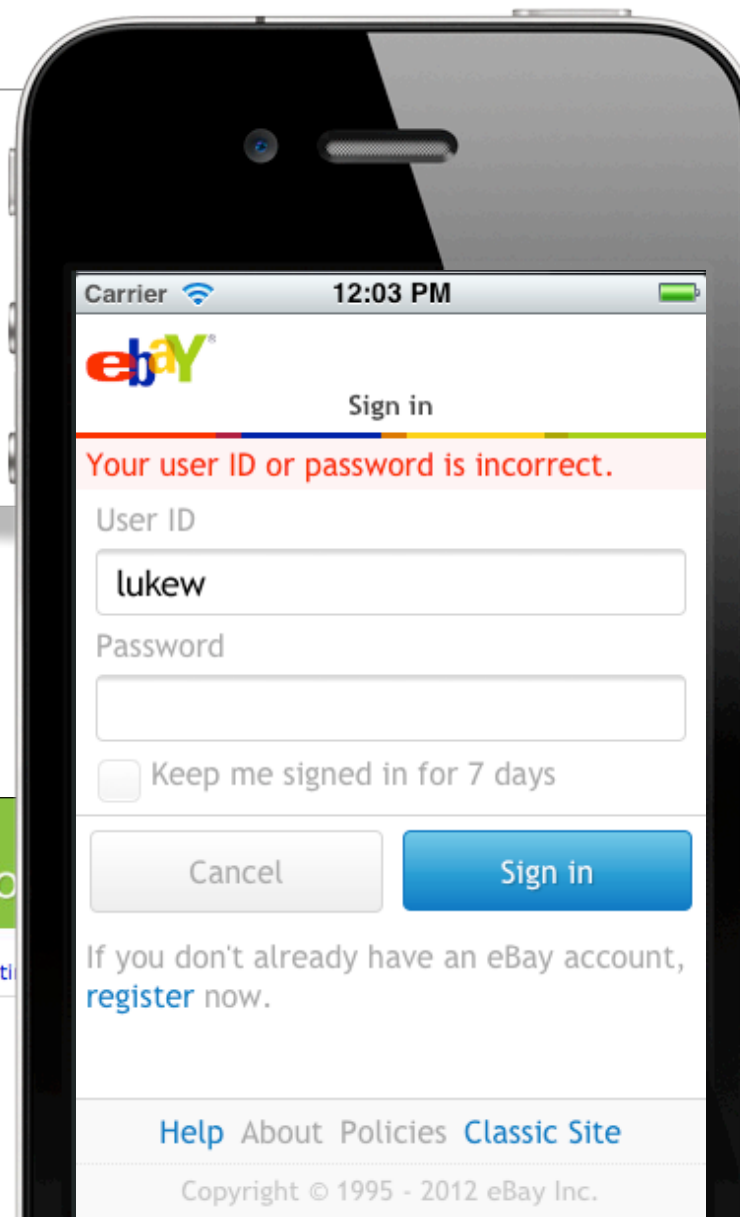
**Not an eBay member?**

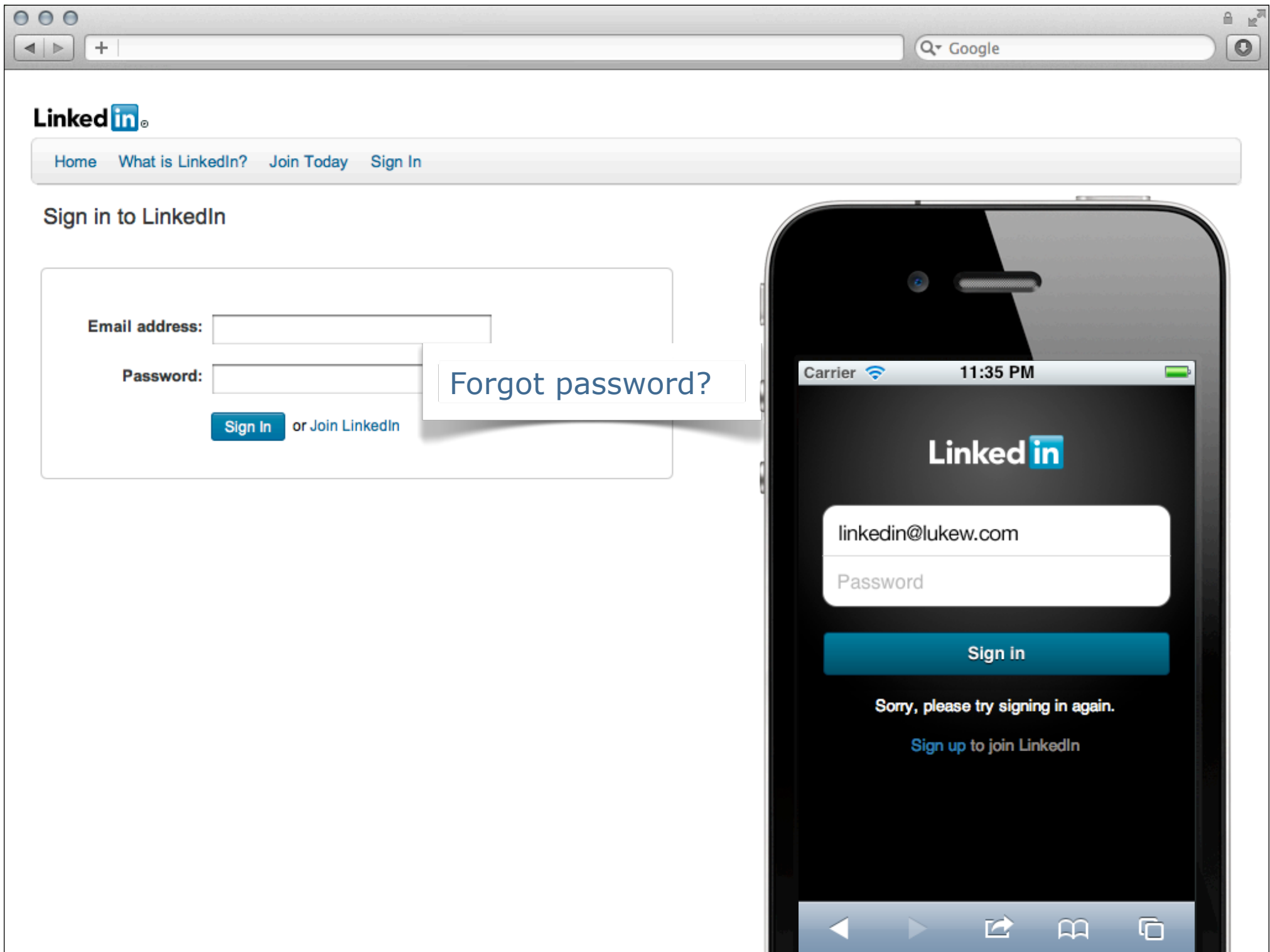
**Register**

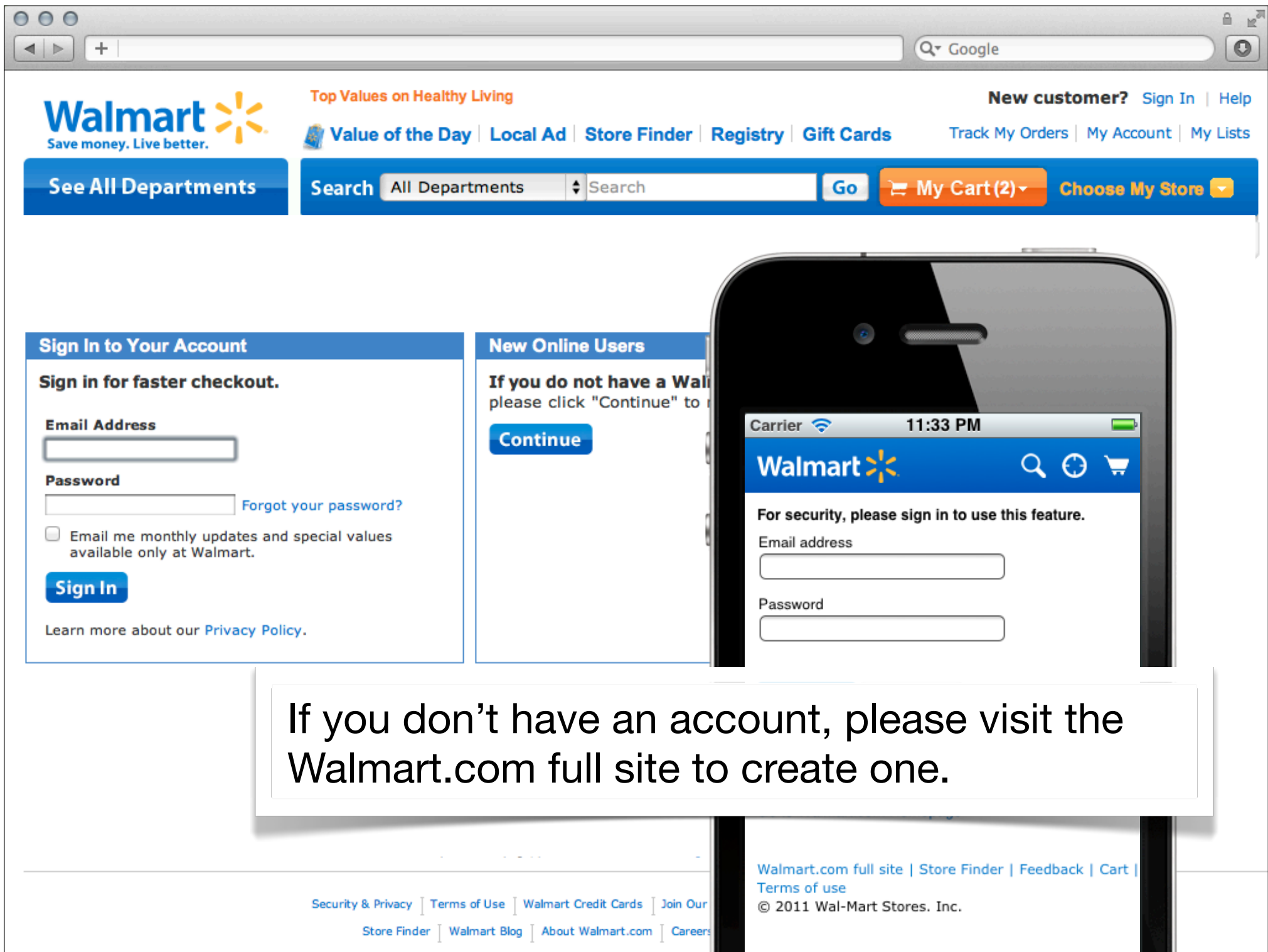
More shopping — Get the browser that gets you

[About eBay](#) | [Security Center](#) | [Buyer Tools](#) | [Policies](#) | [Stores](#) | [eBay Wish list](#) | [Site Map](#) | [eBay official ti](#)

Copyright © 1995-2012 eBay Inc. All Rights Reserved. Designated trademarks and brands  
constitutes acceptance of the eBay [User Agreement](#) and [Privacy Policy](#).







If you don't have an account, please visit the Walmart.com full site to create one.



“Mobile must never be a dumbed-down, limited experience.” -Steven Hooper

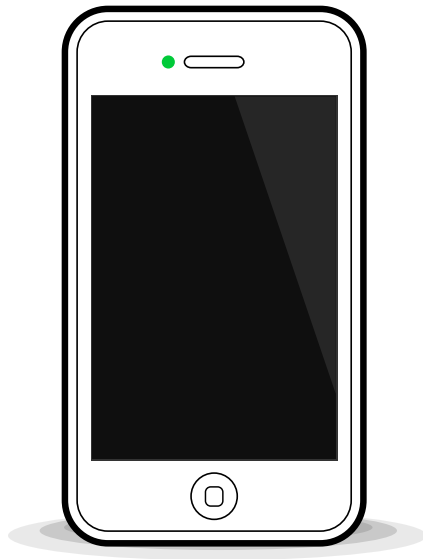
# Interfaces

O'REILLY®

*Steven Hooper  
& Eric Berkman*



# LOGIN



- Don't remove **critical** features
- Use input types & attributes
- Show passwords by default
- Use input masks, if needed
- If possible, save passwords
- Consider single sign-on

# Input Types & Attributes



type=password  
autocapitalize=off  
autocomplete=off

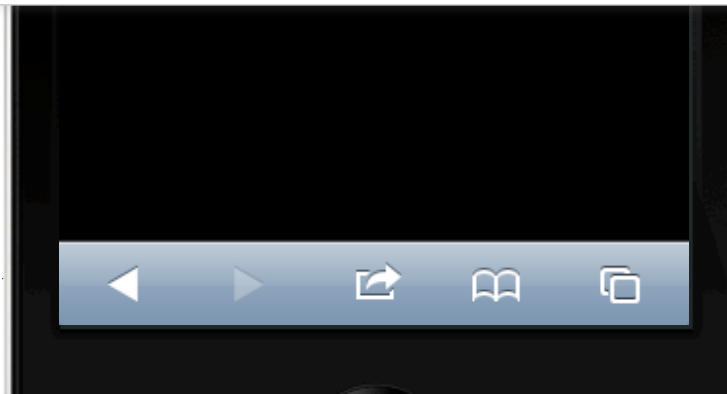
type=email  
autocapitalize=off  
autocomplete=off

# Show Passwords

---



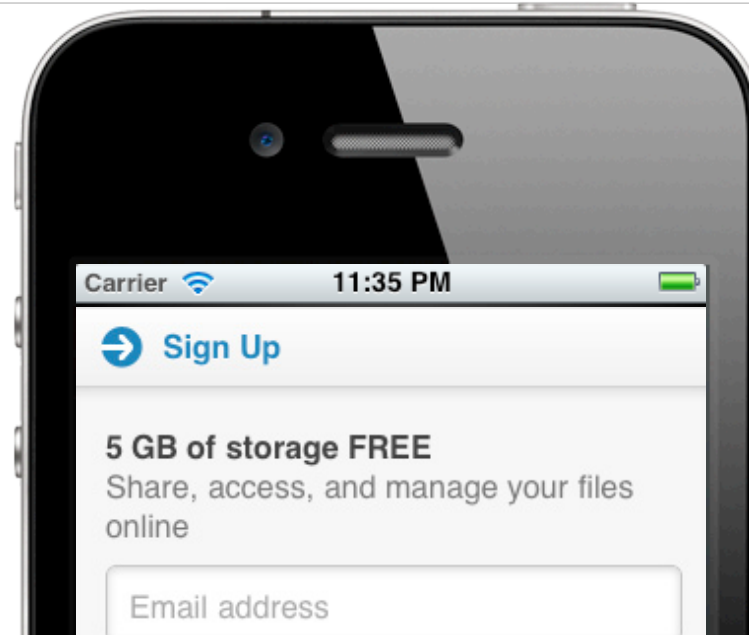
“Masking passwords doesn’t even increase security, but it does cost you business due to login failures.” -Jakob Nielsen



A man with thinning grey hair and glasses, wearing a dark blue suit, a pink shirt, and a patterned tie, is shown from the chest up. He is looking upwards and to the right, with his mouth open as if speaking. His hands are raised in front of him, palms facing each other, in a gesture of emphasis. The background is a blurred indoor setting with warm lighting and some architectural lines. A white speech bubble with a tail pointing towards the man's mouth is overlaid on the left side of the image.

“...and it's worse  
on mobile.”

# Show Passwords

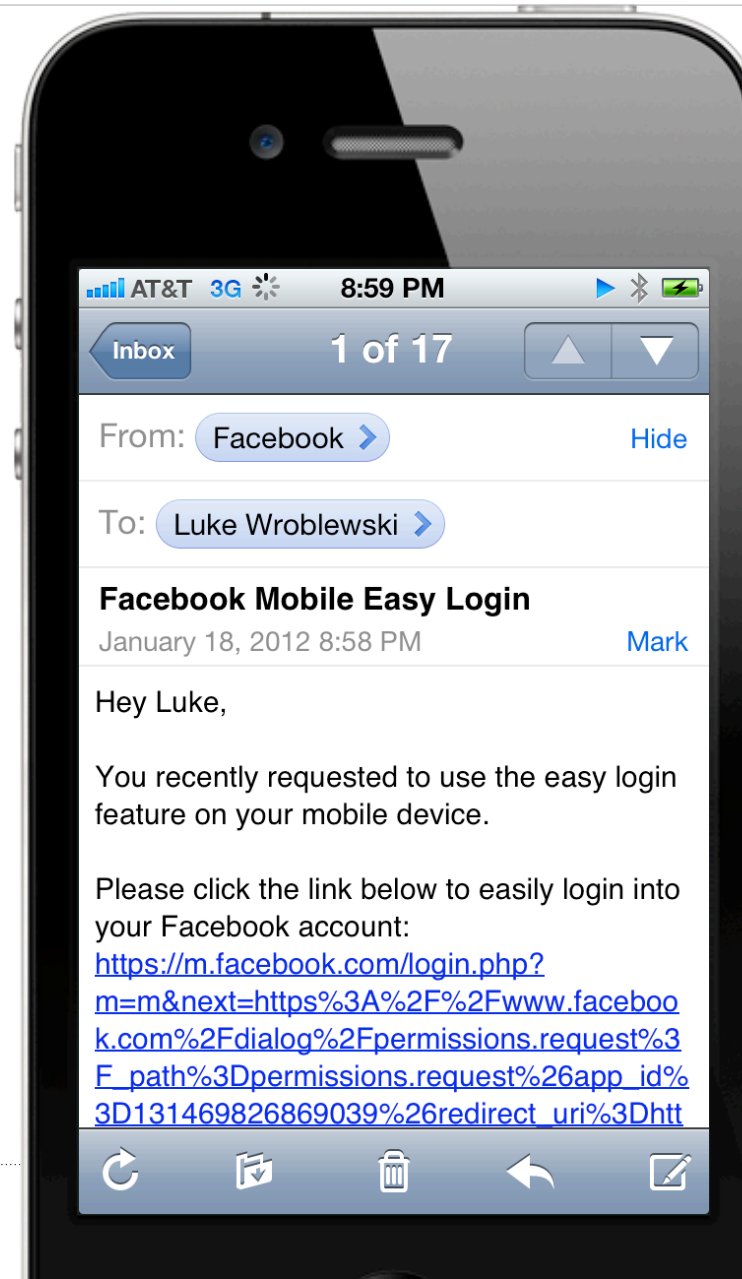


Smart  
Defaults



Hide password

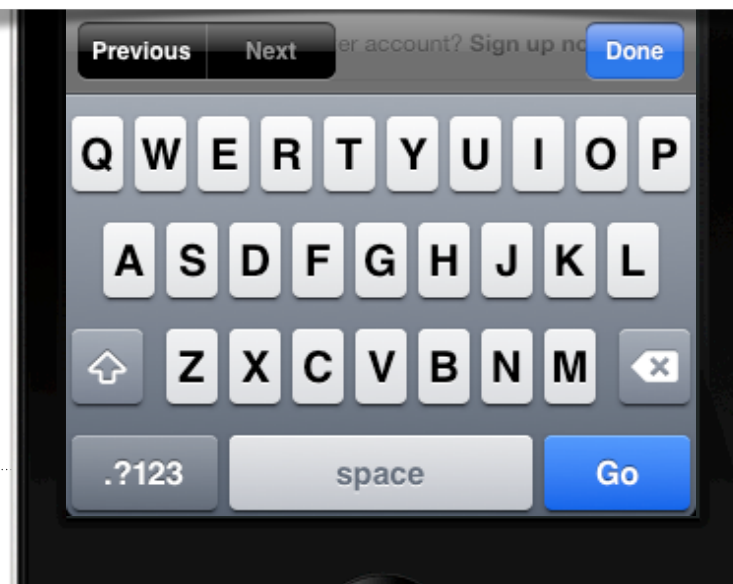
# Show Passwords



# Input Masks



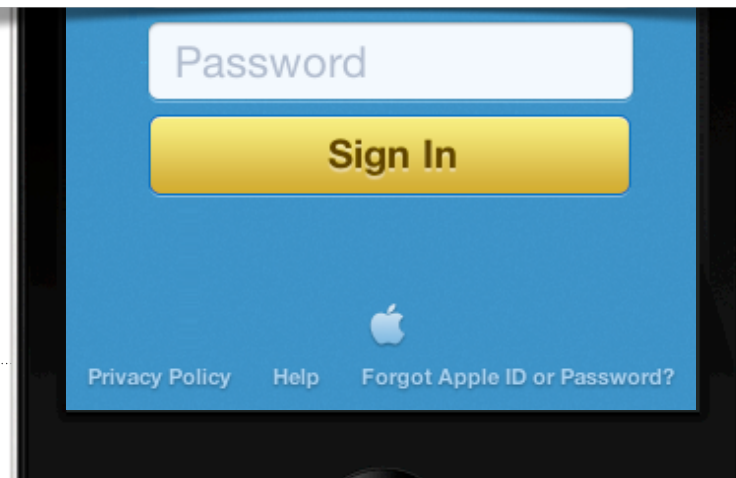
Username @lukew



# Input Masks

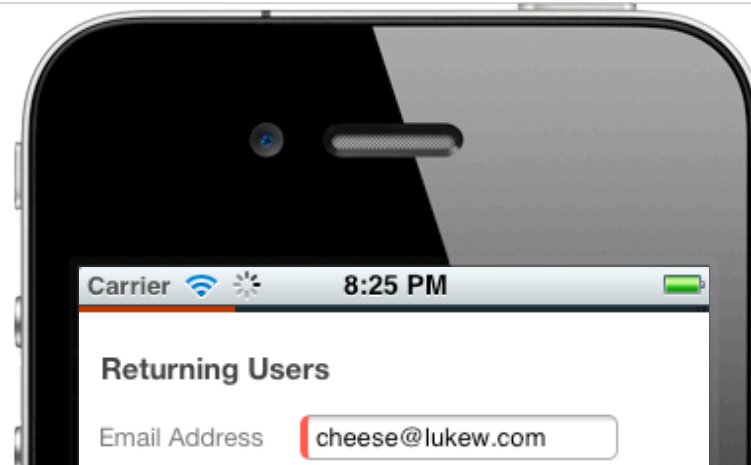


steve@|me.comm

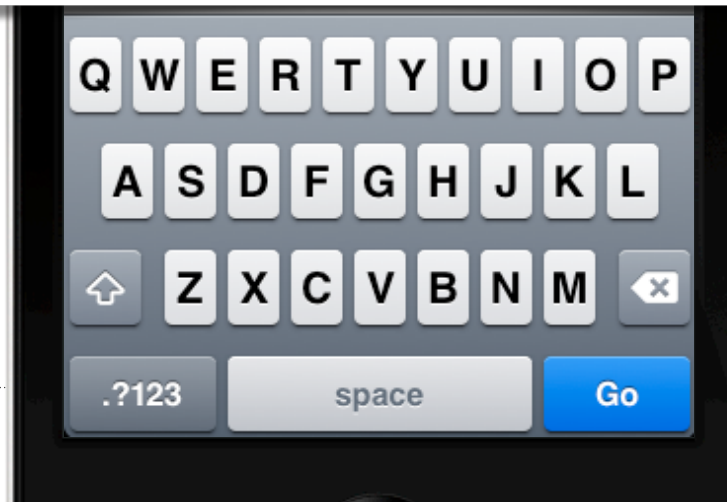




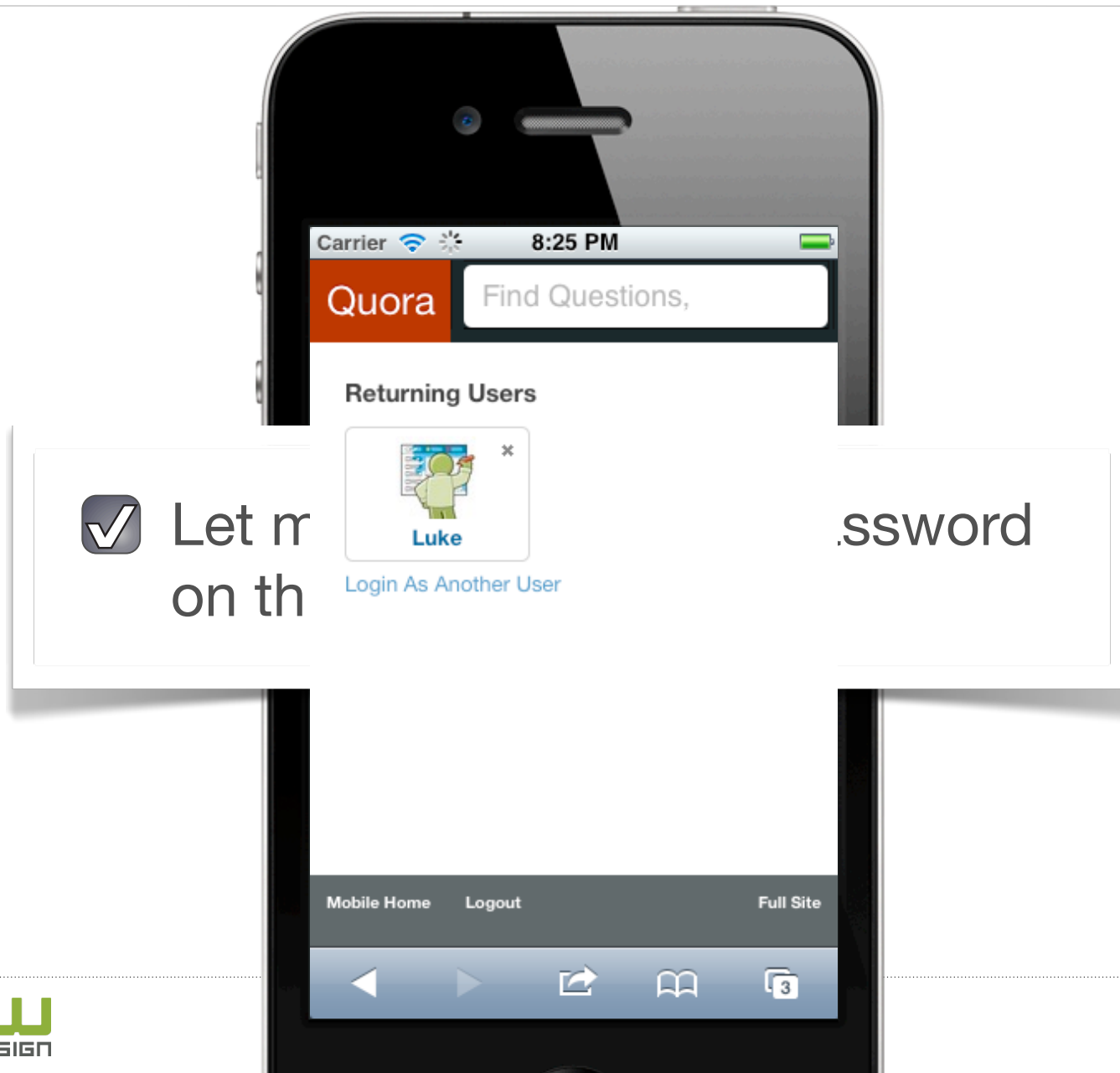
# Avoiding Errors



No account found for this email address.  
To create an account, [sign up for Quora](#).

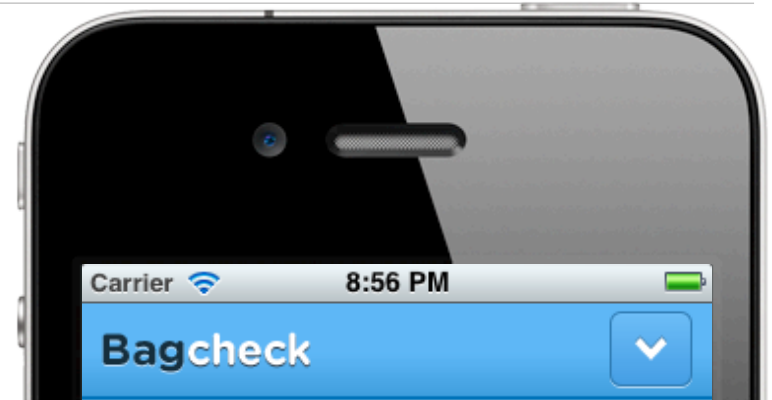


# Saving Passwords



# Single Sign-On

- **845M** active users
- **50%** log in daily
- **500M** use platform



## Sign In



USING FACEBOOK



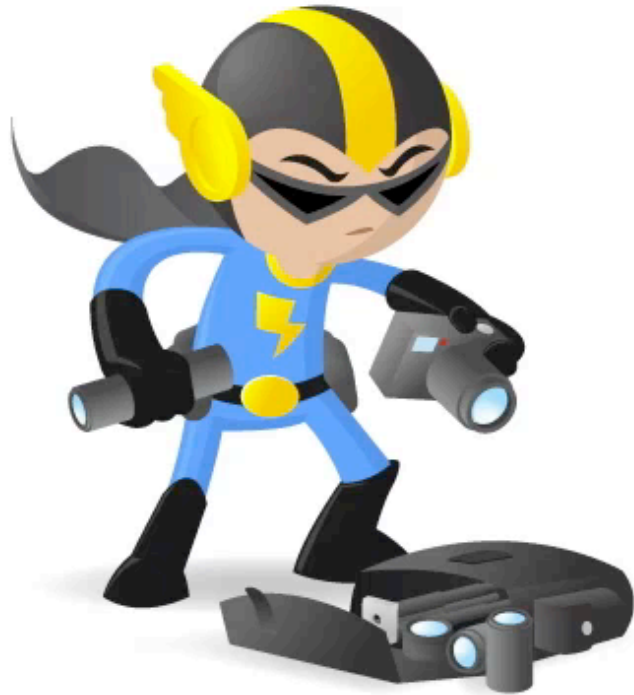
USING TWITTER

Password

SIGN IN

• [FORGOT PASSWORD?](#)



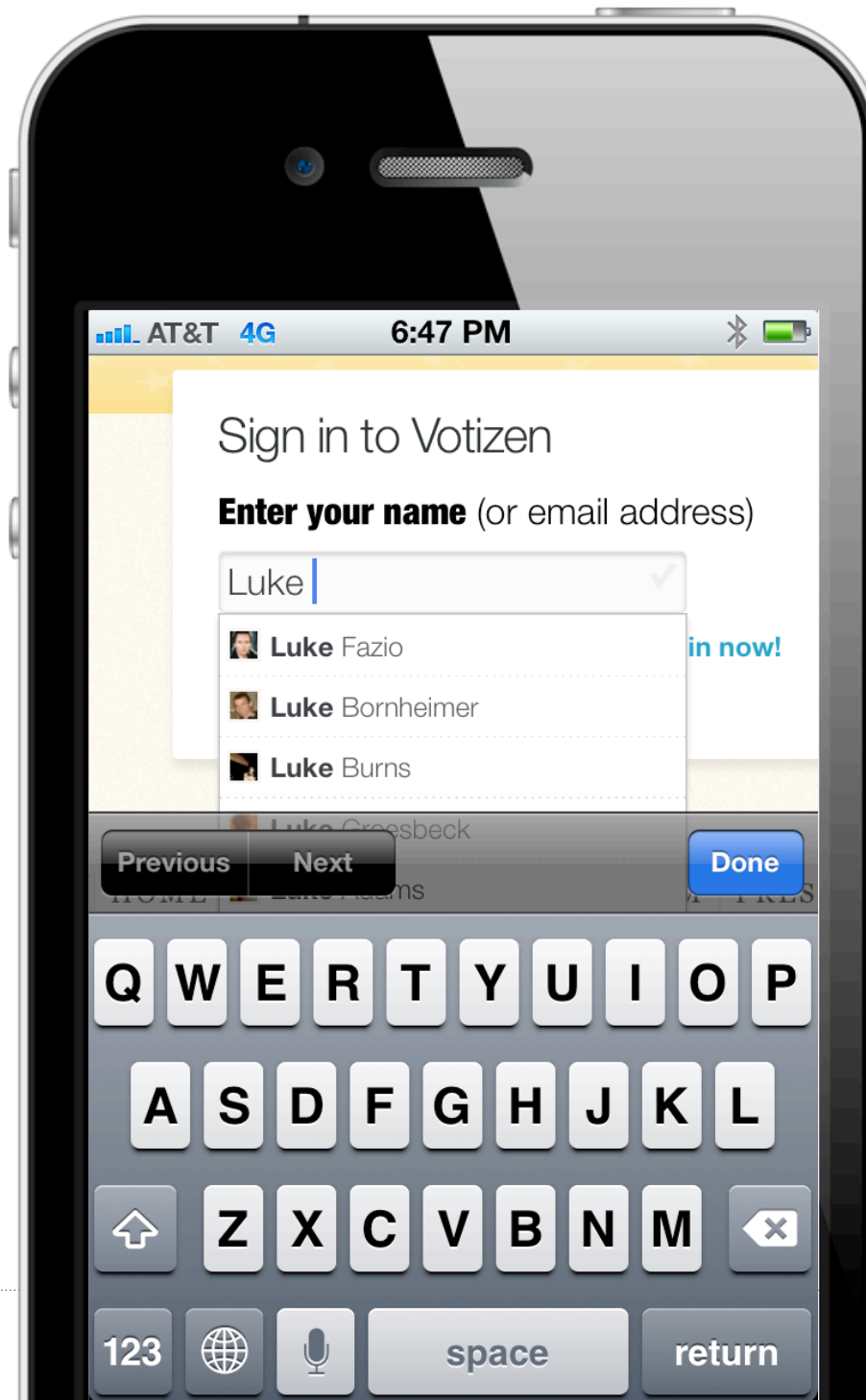


## Sign In to Bagcheck

Enter Your Name (or email)

Can't find your name or new here? [Join Now](#)





## Sign In



USING FACEBOOK



USING TWITTER

### Or Your Bagcheck Account

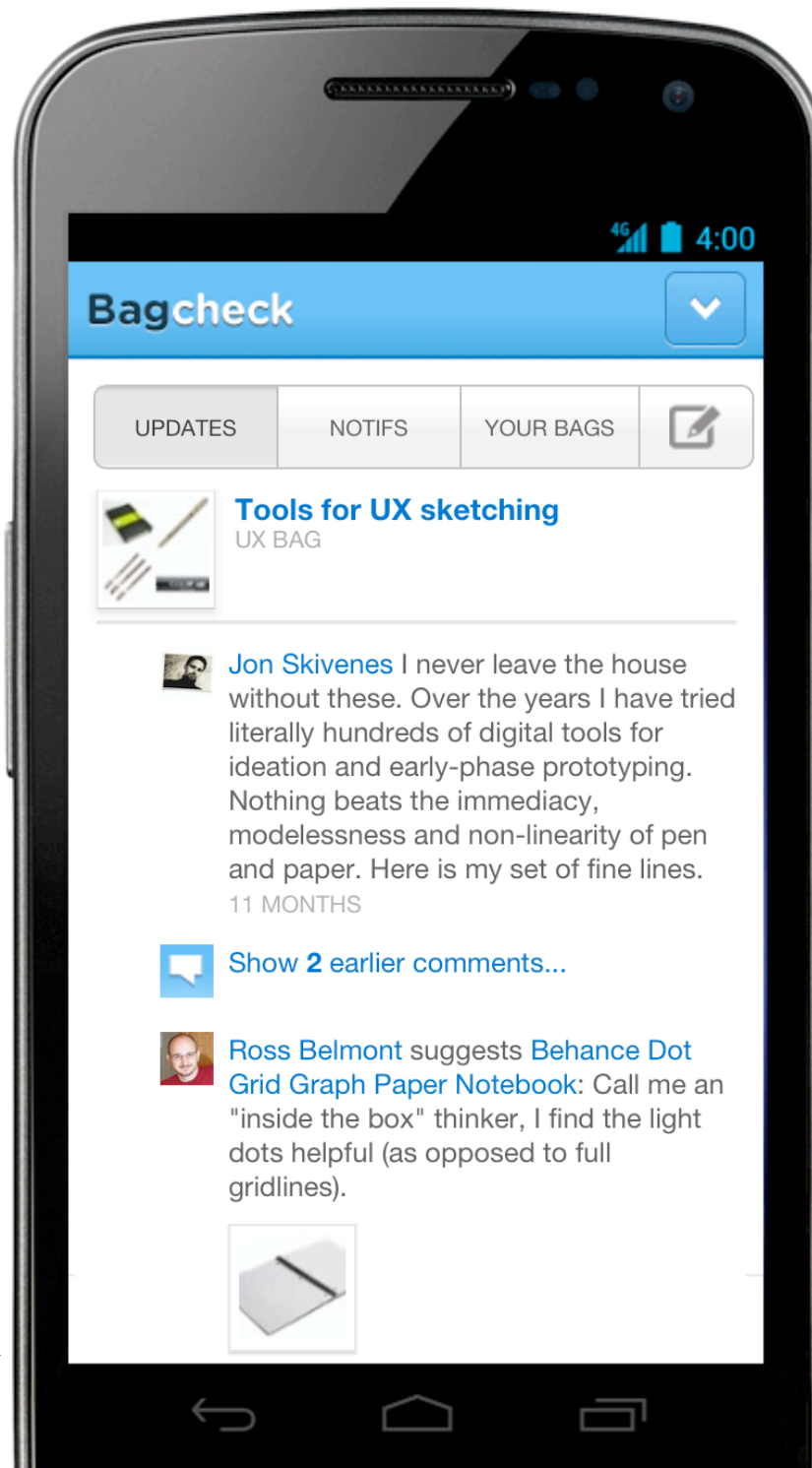
Email Address

Password

SIGN IN

[FORGOT PASSWORD?](#)

[ABOUT](#) | [BLOG](#) | [TERMS](#) | [FULL SITE](#)





Be flexible in what you accept

Use input types & attributes

If possible, save passwords

Show password by default

Don't remove critical features

Bagcheck

Sign In

Email or Full Name

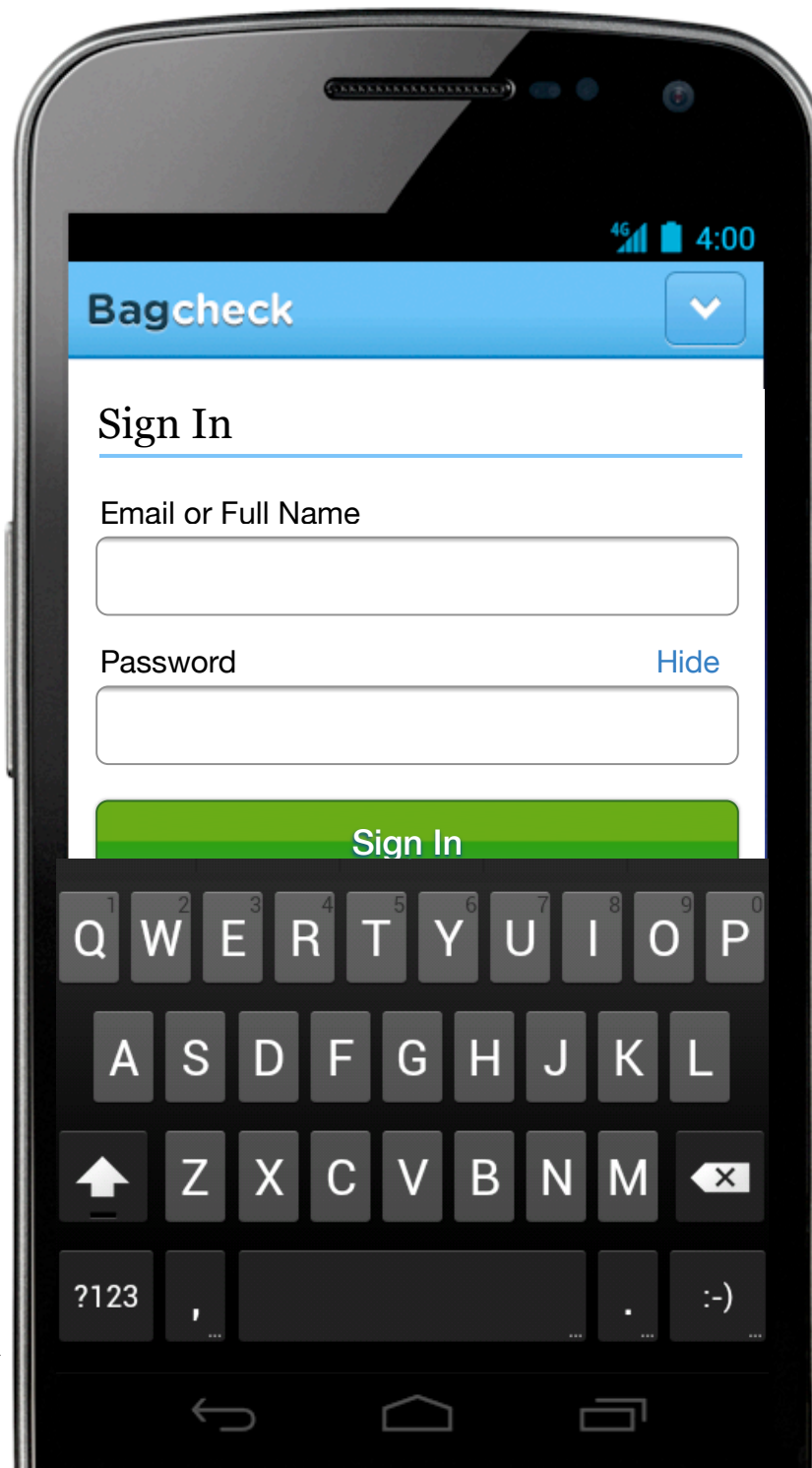
Password [Hide](#)

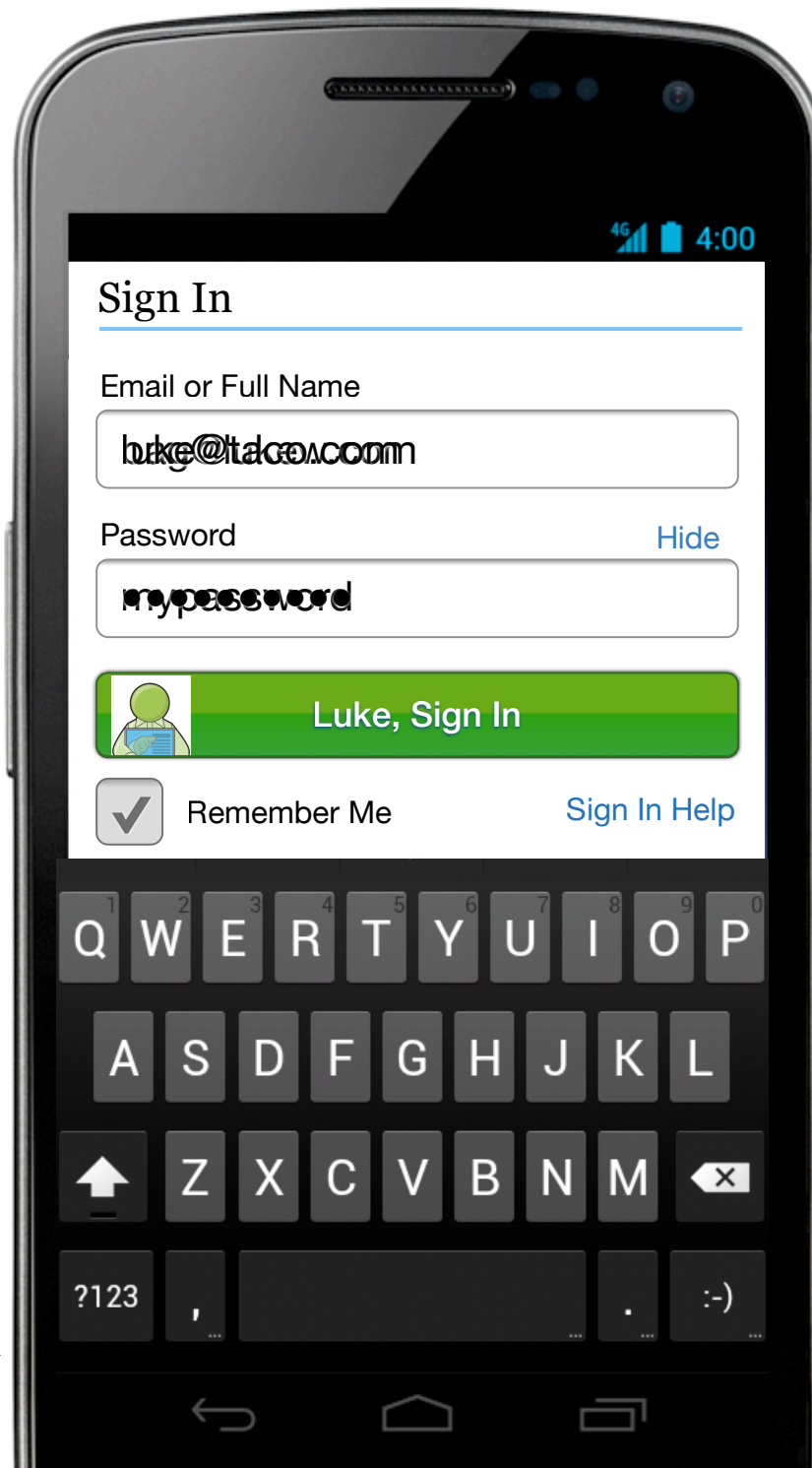
Sign In

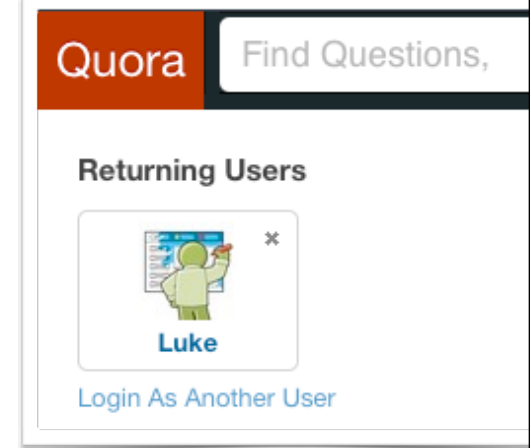
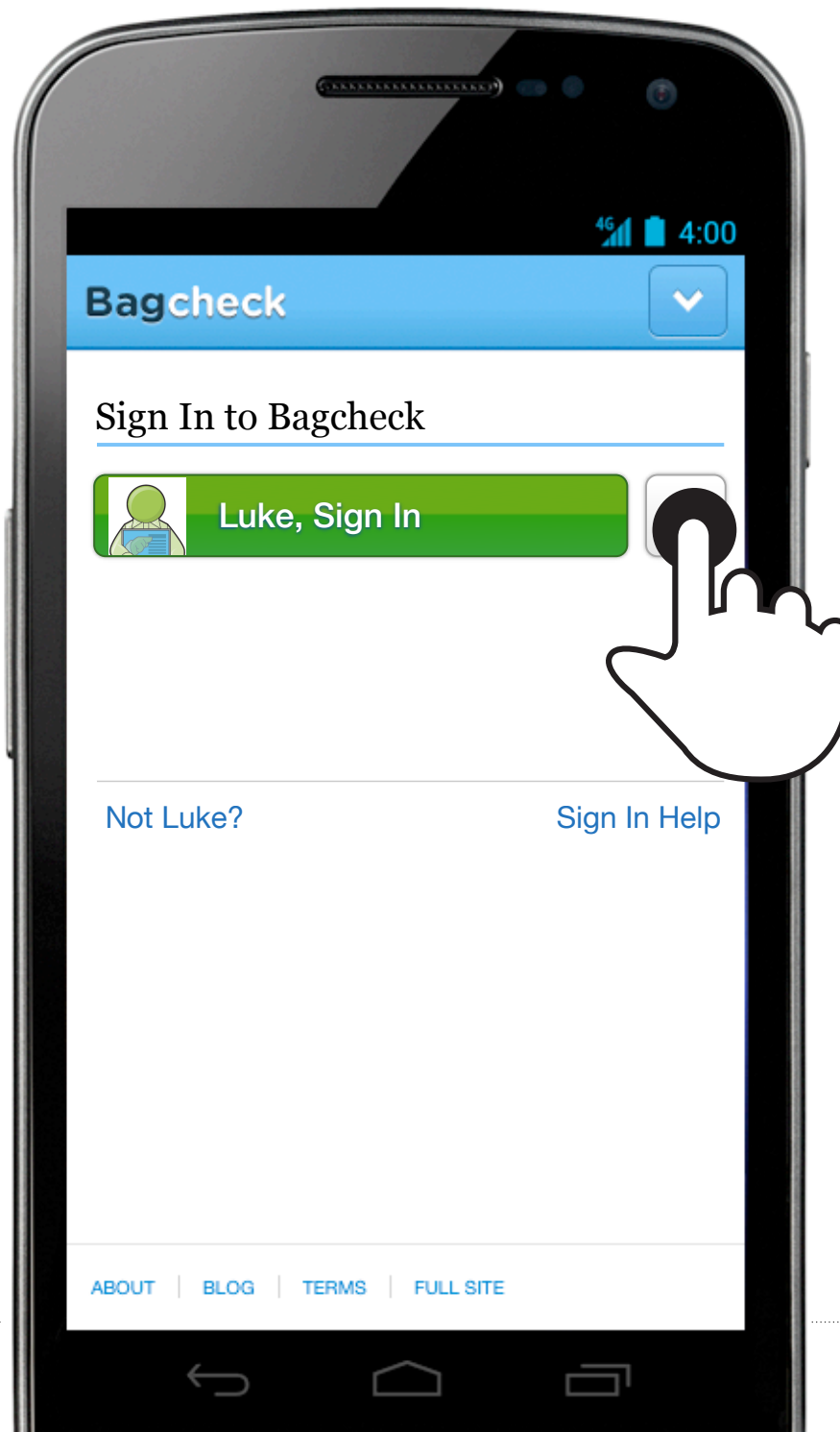
☒ Remember Me [Sign In Help](#)

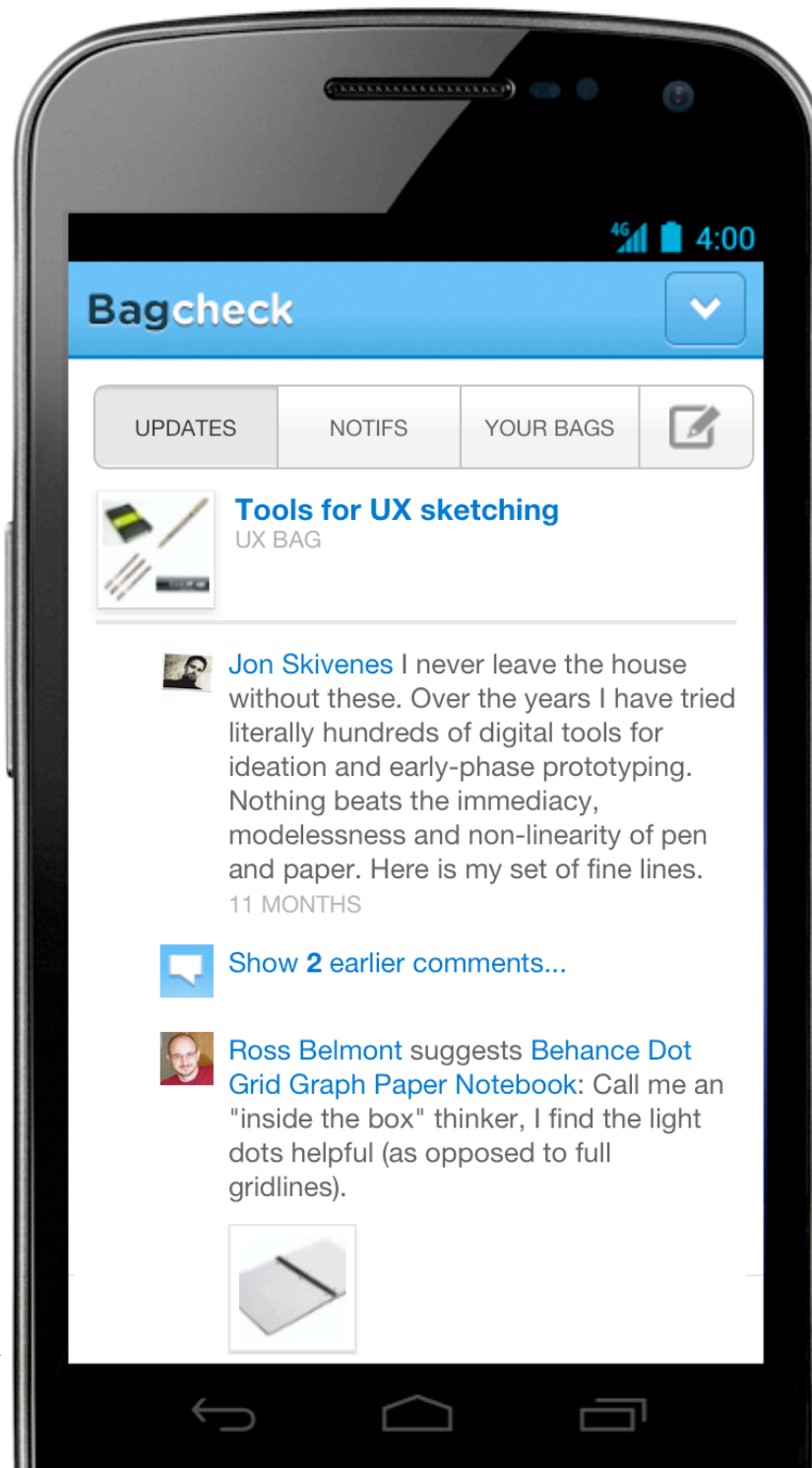
[New Here? Sign Up](#)

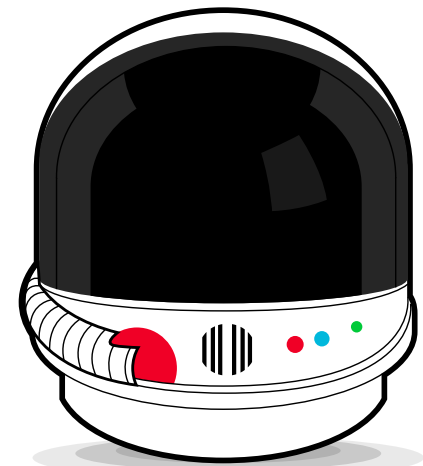
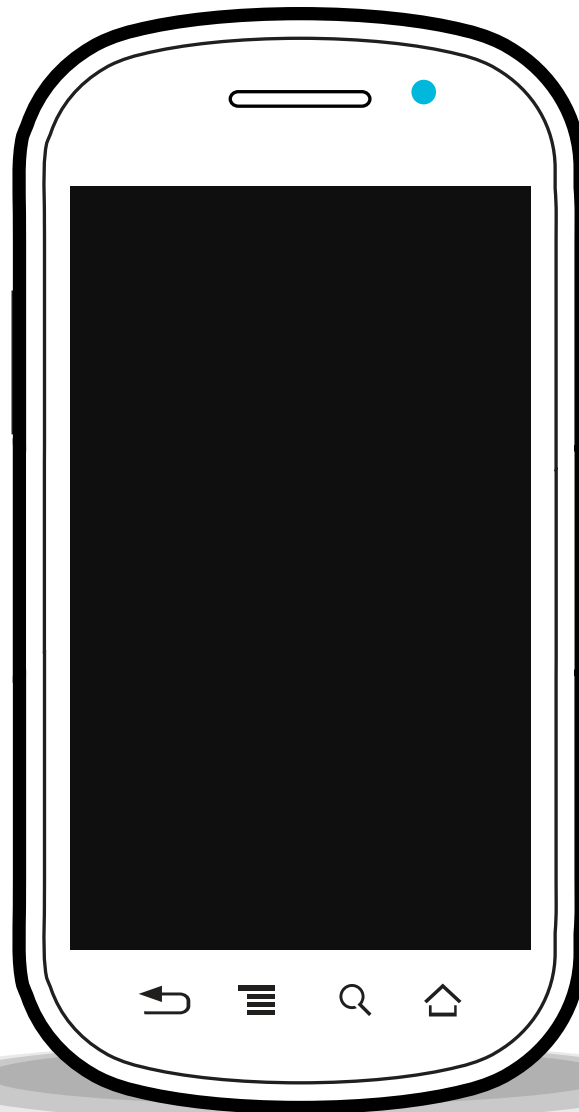
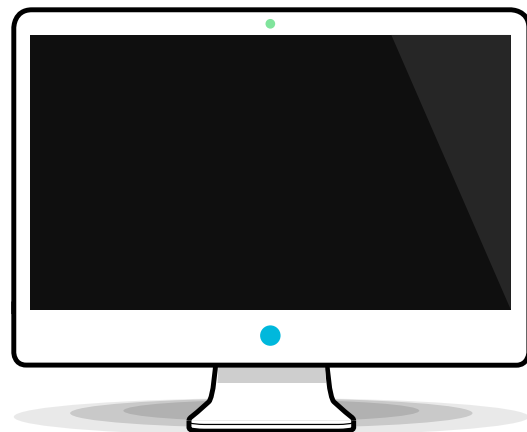
[ABOUT](#) | [BLOG](#) | [TERMS](#) | [FULL SITE](#)











# FORMS

Me: Log In

Us: Checkout

You: Exercise

# CHECKOUT



**75%**

2011 shopping cart abandonment rate

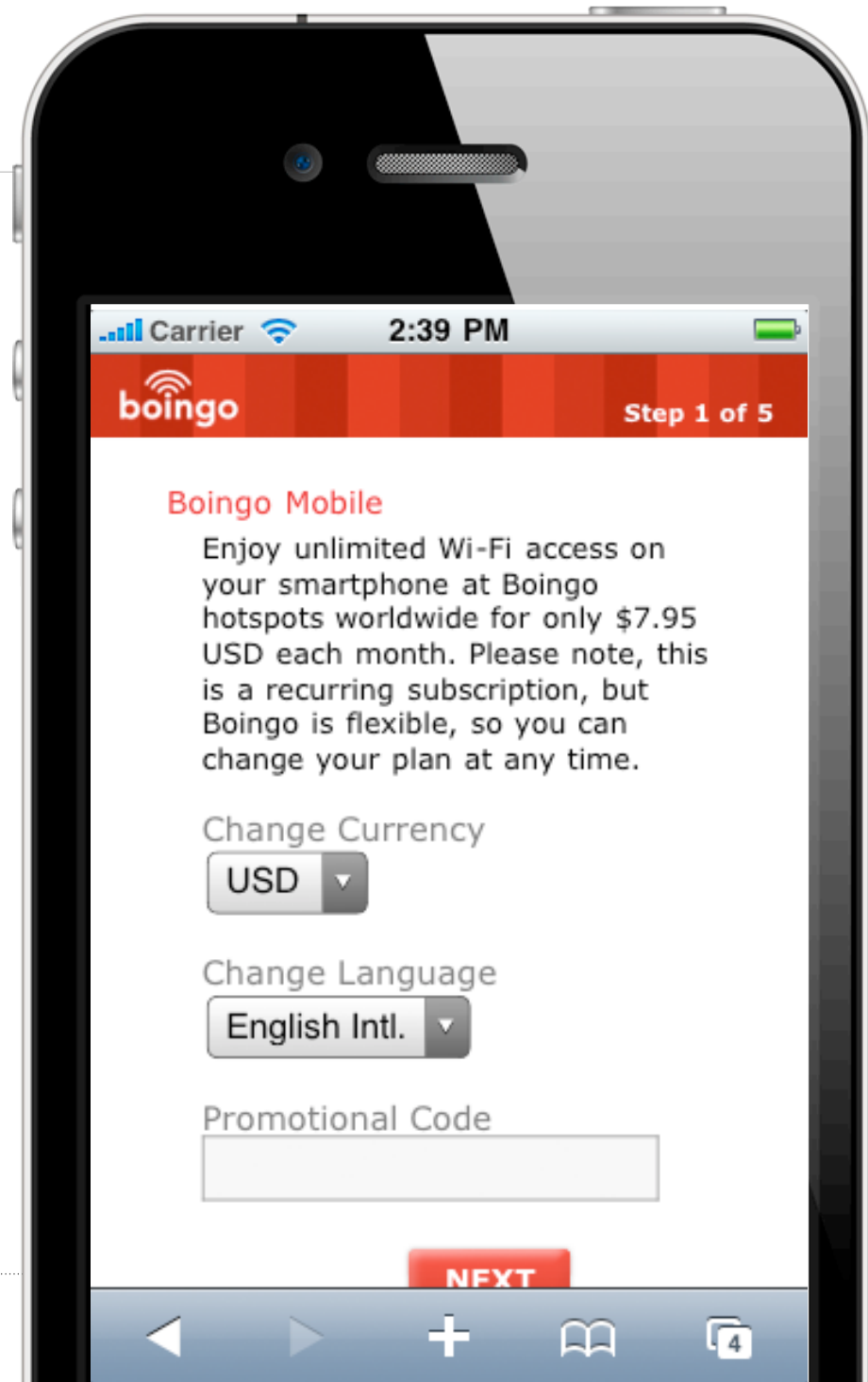
**71%**

2010 shopping cart abandonment rate





# Mobile Checkout



Carrier 2:39 PM

boingo Step 1 of 5

**Boingo Mobile**  
Enjoy unlimited Wi-Fi access on your smartphone at Boingo hotspots worldwide for only \$7.95 USD each month. Please note, this

Change Currency  
USD ▼

Change Language  
English Intl. ▼

Promotional Code

**NEXT**

Top Aligned Labels

Carrier 2:39 PM

boingo Step 2 of 5

**Set Up Your Account**

**Contact Information**

\*First Name

\*Last Name

\*Username

Your username must be in lowercase letters, between 4 and 16 characters in length. Numbers and periods can be included in your

Your password must contain at least 6 characters.

\*Confirm Password

\*Email

\*Mobile Number

Fields marked with an \* are required.






**BACK** **NEXT**

Inline Help Text

Input Types

Carrier 2:41 PM

boingo Step 3 of 5

**We accept**     

\*Number

\*Expiration

\*Country  
United States of America ▼

\*ZIP/Postal Code

Required for US addresses only

\*CVV2 [What is CVV2?](#)

Required for addresses outside of the US

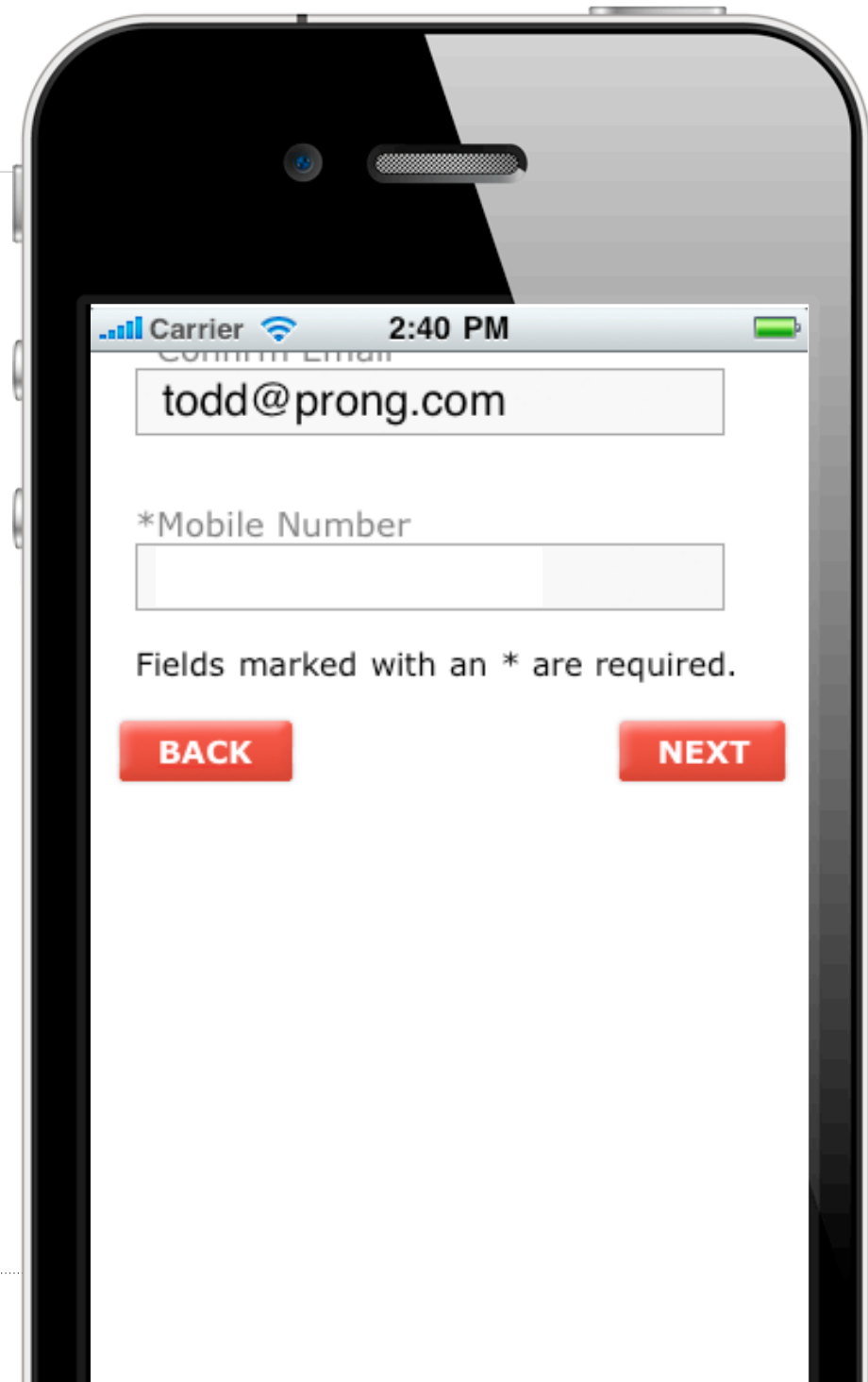
Fields marked with an \* are required.

**BACK** **NEXT**

Unnecessary Inputs

Smart Defaults

# Mobile Checkout



The image shows a smartphone screen with a checkout form. The status bar at the top displays 'Carrier', signal strength, Wi-Fi, the time '2:40 PM', and a battery icon. The form includes an email input field with 'todd@prong.com', a required mobile number input field marked with an asterisk, and a note that fields with an asterisk are required. At the bottom are 'BACK' and 'NEXT' buttons.

Carrier 2:40 PM

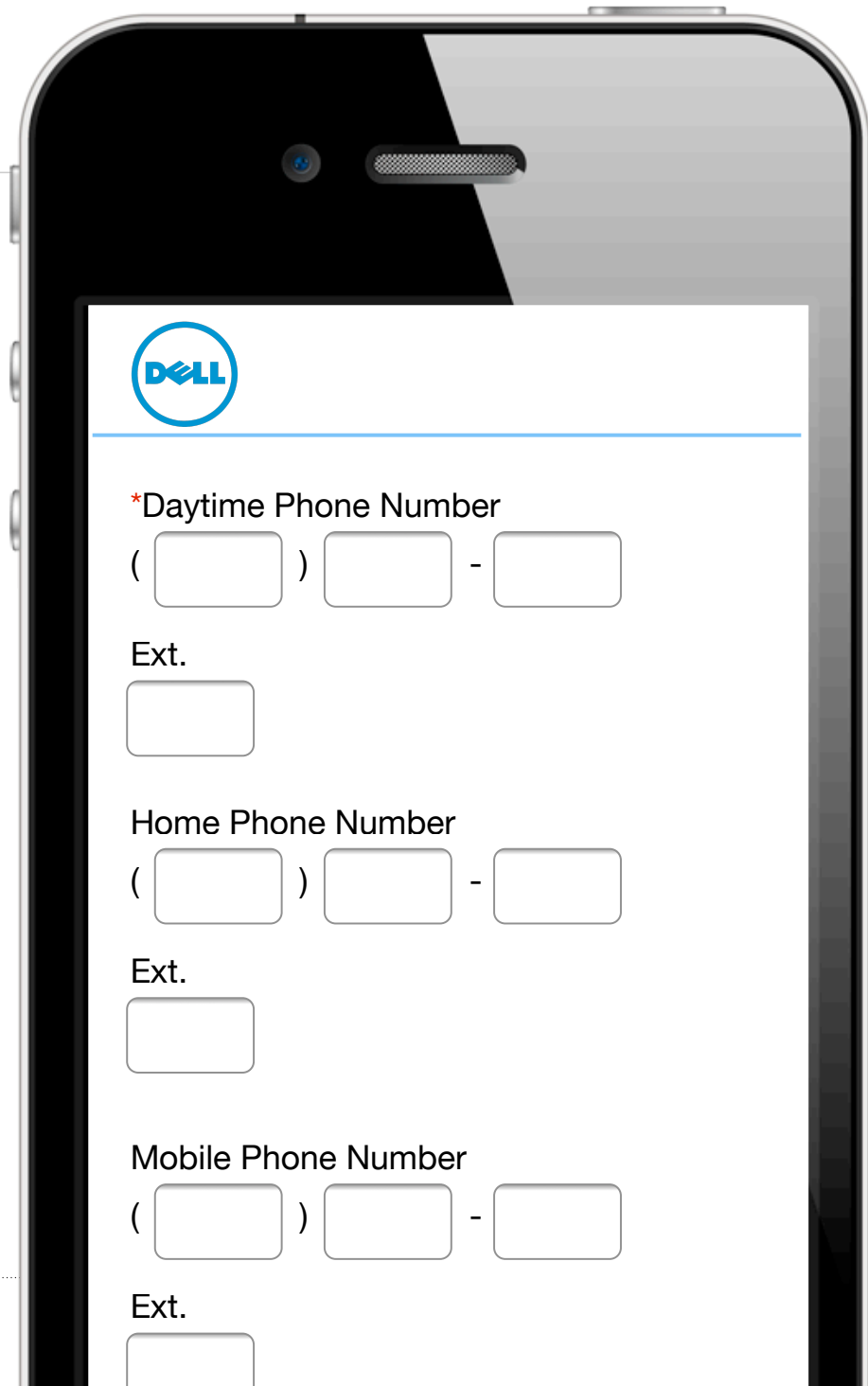
todd@prong.com

\*Mobile Number

Fields marked with an \* are required.

BACK NEXT

# Phone Numbers



The image shows a smartphone screen with a white background. At the top left is the Dell logo. Below it is a horizontal blue line. The form contains three sections, each with a label, a phone number input field, and an extension input field.

**\*Daytime Phone Number**  
(  )  -   
Ext.

**Home Phone Number**  
(  )  -   
Ext.

**Mobile Phone Number**  
(  )  -   
Ext.

# Phone Numbers

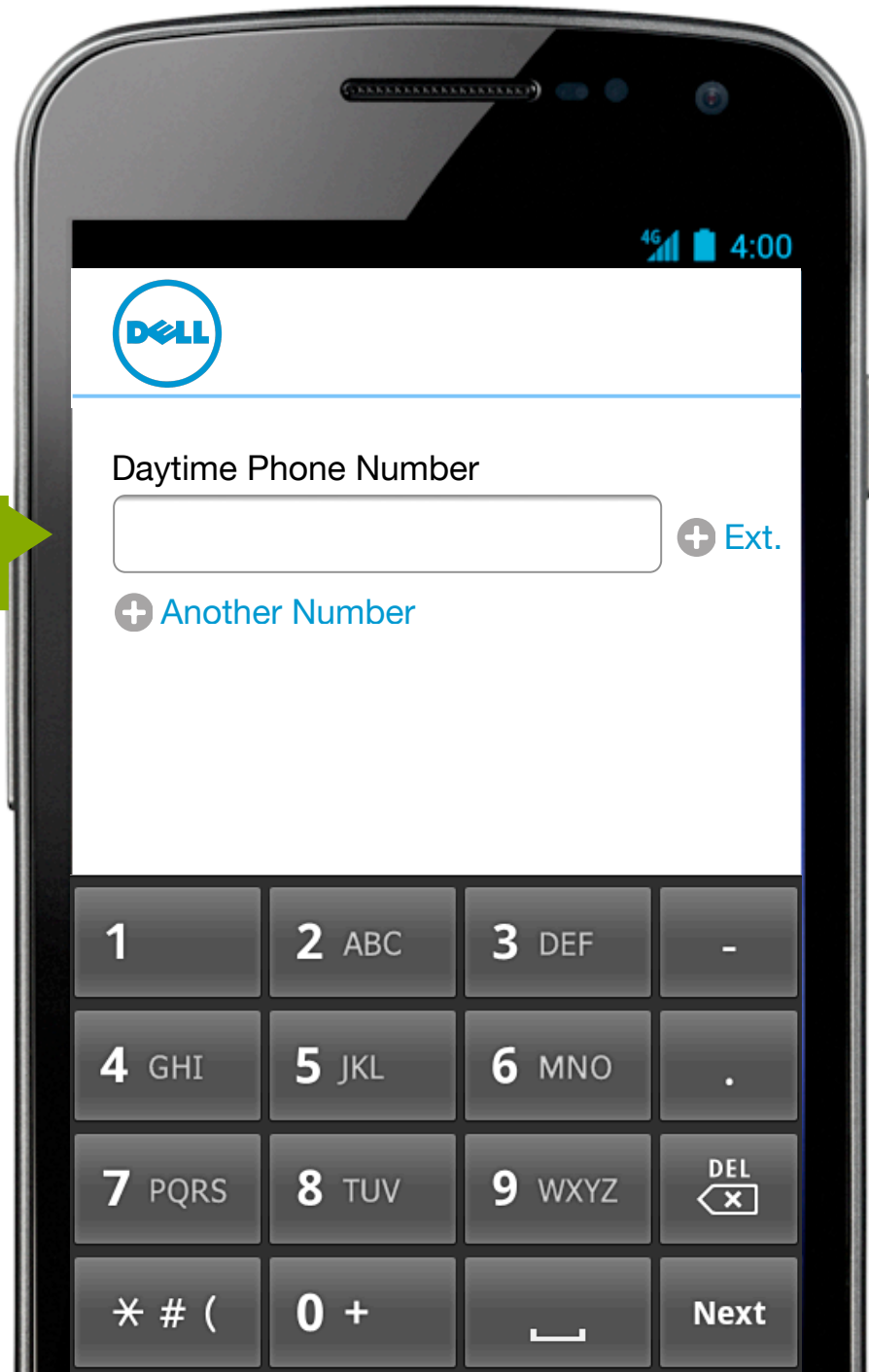
input type=tel

hide irrelevant  
controls

The image shows a smartphone screen with a Dell contact form. At the top is the Dell logo. Below it is the label "Daytime Phone Number" followed by a text input field. To the right of the input field is a "+ Ext." button. Below the input field is a "+ Another Number" link. At the bottom of the form is a navigation bar with "Previous", "Next", and "Done" buttons. Below the navigation bar is a numeric keypad. The keypad has buttons for digits 1 through 9, 0, and symbols +, \*, and #. Each digit button also displays the corresponding letters (e.g., 1 has no letters, 2 has ABC, 3 has DEF, etc.). There is also a backspace button with an 'X' icon.

# Phone Numbers

input type=tel



A smartphone mockup displaying a contact form. At the top is the Dell logo. Below it is the label "Daytime Phone Number" followed by a text input field. To the right of the input field is a "+ Ext." link. Below the input field is a "+ Another Number" link. At the bottom of the screen is a numeric keypad with buttons for digits 1-9, \*, #, 0, and a "Next" button. The keypad also includes letters for T9-style input (e.g., "2 ABC", "3 DEF").

# Phone Number

input type=tel

The image shows a smartphone screen with a contact form. At the top, the status bar displays 'Luke's 2nd kindle 1', the time '11:04', and icons for settings, Wi-Fi, and battery. Below the status bar is a browser-like header with 'Site Name' and a close button. The main content area features the Dell logo, followed by the label 'Daytime Phone Number'. Below this is a text input field with a '+ Ext.' button to its right. Underneath the input field is a '+ Another Number' link. At the bottom of the screen is a numeric keypad with buttons for digits 1-9, 0, and symbols like #, \*, /, +, -, ., , (, and ).



# Phone Numbers



input mask

Carrier 2:39 PM

boingo Step 1 of 5

**Boingo Mobile**

Enjoy unlimited Wi-Fi access on your smartphone at Boingo hotspots worldwide for only \$7.95 USD each month. Please note, this is a recurring subscription, but Boingo is flexible, so you can change your plan at any time.

Change Currency  
USD

Change Language  
English Intl.

Promotional Code

NEXT

Carrier 2:41 PM

Get Online Now boingo

Unlimited access for **24 hours is \$6.95** for all boingo locations. No monthly fees apply.

**Billing Information**

First Name

Last Name

Credit Card Number

VISA MasterCard AMEX DISCOVER are accepted

Expiration Date  
09 2010

CVV Code

**Receipt**

Email Address (optional)

if you'd like us to send you a receipt

By selecting "Get Online" I agree to [terms of use](#).

Get Online Cancel

Carrier 2:41 PM

boingo Step 3 of 5

**Your Account**

**Card Information**

Accepted VISA MasterCard AMEX DISCOVER JCB

Card Number

Expiration  
09 Year 2010

Country  
United States of America

Postal Code

Required for US addresses only

2 [What is CVV2?](#)

Required for addresses outside of US

Fields marked with an \* are required.

OK NEXT

title: user goal

minimum requirements

unnecessary

optional labeled

inline help text

primary action

Carrier 2:41 PM

**Get Online Now** boingo

Unlimited access for **24 hours is \$6.95** for all boingo locations. No monthly fees apply.





---

**Billing Information**

First Name

Last Name

Credit Card Number

    are accepted

09 2010

CVV Code

---

**Receipt**

Email Address (optional)

if you'd like us to send you a receipt

---

By selecting "Get Online" I agree to [terms of use](#).

**Get Online** [Cancel](#)

concise info

type=number

type=number

type=email  
autocapitalize=off  
autocomplete=off

streamline terms

Carrier 2:41 PM

**Get Online Now** boingo

Unlimited access for **24 hours is \$6.95** for all boingo locations. No monthly fees apply.

---

**Billing Information**


First Name

Last Name

“Can we do better?”

Expiration Date  
09 2010

CVV Code



---

**Receipt**

Email Address (optional)

if you'd like us to send you a receipt

---

By selecting "Get Online" I agree to [terms of use](#).

**Get Online** [Cancel](#)

## Billing Information

Name

as it appears on credit card

VISA MasterCard AMEX DISCOVER are accepted

Previous

Next

AutoFill

Done

Q W E R T Y U I O P

A S D F G H J K L

↑ Z X C V B N M ↵

.?123

space

Go

type=month

Credit Card Number

    are accepted

Expiration Date

June 2011 ▼

CVV Code



Previous Next Clear Done

April	2009
May	2010
June	2011
July	2012
August	2013

Credit Card Number

Expiration Date

07/12

type=number

mask

Previous

Next

AutoFill

Done

1 2 3 4 5 6 7 8 9 0

- / : ; ( ) \$ & @ "

#+= . , ? ! ' < x

ABC

space

Go

# Bank Name



1234 5678 9876 5432

1234

VALID THRU ▶ MONTH/YEAR  
12/99

CARDHOLDER



# Progressive Enhancement

---

type=month

2011-01



desktop browsers?

javascript

Expiration Date

/

2 number fields?

default

07



2011



Get Online Now



Unlimited access for **24 hours is \$6.95** for all boingo locations. No monthly fees apply.

### Billing Information

First Name

Last Name

Credit Card Number

ONLY 5 REQUIREMENTS!

09 ▼ 2010 ▼

CVV Code



### Receipt

Email Address (optional)

if you'd like us to send you a receipt

By selecting "Get Online" I agree to [terms of use](#).

Get Online

[Cancel](#)

Get Online Now



Unlimited access for **24 hours is \$6.95** for all boingo locations. No monthly fees apply.

### Billing Information

Name

as it appears on your credit card

Credit Card Number



are accepted

Expiration Date

June 2011 ▼

CVV Code



### Receipt

Email Address (optional)

if you'd like us to send you a receipt

By selecting "Get Online" I agree to [terms of use](#).

Get Online

stay on keys

progressive  
enhancement

remove secondary  
action

**Get Online Now**



Unlimited access for **24 hours is \$6.95** for all boingo locations. No monthly fees apply.

### Billing Information

Name

as it appears on your credit card

Credit Card Number

“Can we do better?”

CVV Code



### Receipt

Email Address (optional)

if you'd like us to send you a receipt

By selecting "Get Online" I agree to [terms of use](#).

**Get Online**

**Get Online Now**



Unlimited access for **24 hours is \$6.95** for all boingo locations. No monthly fees apply.

### Billing Information

Name

as it appears on your credit card

### Credit or Debit Card



5123 4356 1234 1905

Enter card number, expiration date & CVV code

if you'd like us to send you a receipt

By selecting "Get Online" I agree to [terms of use](#).

**Get Online**

**Get Online Now**



Unlimited access for **24 hours is \$6.95** for all boingo locations. No monthly fees apply.

### Billing Information

Name

as it appears on your credit card

### Credit or Debit Card



5123 4356 12 912

Enter card number, expiration date & CVV code

if you'd like us to send you a receipt

By selecting "Get Online" I agree to [terms of use](#).

**Get Online**

reduced number of  
controls/inputs

Stay on the keys



**Get Online Now**



Unlimited access for **24 hours is \$6.95** for all boingo locations. No monthly fees apply.

Credit or Debit Card

 1234 5678 9012 3456

enter card number, expiration date, & CVV code

Name on Credit Card

Email Address (optional)

if you'd like us to send you a receipt

By selecting "Get Online" I agree to [terms of use](#).

**Get Online**

**Get Online**

Carrier 2:39 PM

boingo Step 1 of 5

**Boingo Mobile**

Enjoy unlimited Wi-Fi access on your smartphone at Boingo hotspots worldwide for only \$7.95 USD each month. Please note, this is a recurring subscription, but Boingo is flexible, so you can change your plan at any time.

Change Currency  
USD

Change Language  
English Intl.

Promotional Code

NEXT

Carrier 2:41 PM

boingo Step 2 of 5

**Get Online Now**

Unlimited access for **24 hours is \$6.95** for all boingo locations. No monthly fees apply.

Credit or Debit Card

1234 5678 9012 3456

enter card number, expiration date, & CVV code

Name on Credit Card

Email Address (optional)

if you'd like us to send you a receipt

By selecting "Get Online" I agree to [terms of use](#).

Get Online

Carrier 2:41 PM

boingo Step 3 of 5

**Set Up Your Account**

**Credit Card Information**

accept     

Number

Expiration  
Month 09 Year 2010

Country  
United States of America

ZIP/Postal Code

Required for US addresses only

CVV2 [What is CVV2?](#)

Required for addresses outside of US

Fields marked with an \* are required.

BACK NEXT

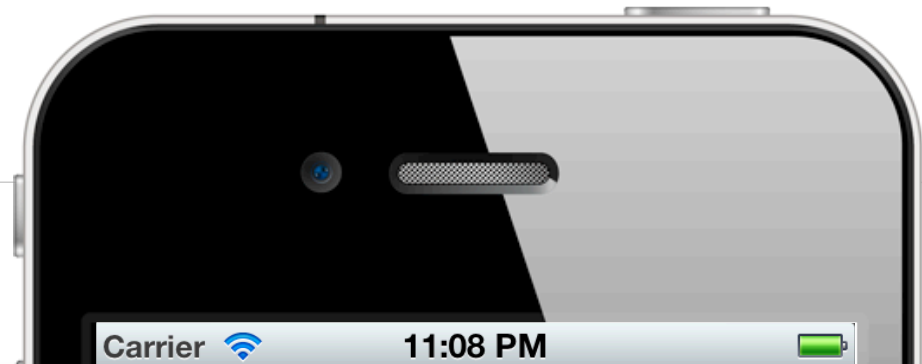
\*Confirm Email

\*Mobile Number

Fields marked with an \* are required.

BACK NEXT

# Digital Content



## WHY BOTHER?

1. Permanently carried
2. Always on
3. Available at point of inspiration

stay on keys

reduced controls

Enter card number, expiration date & CVV code

Cardholder Name

[+ Pay with Gift Certificate or Promo](#)

**Purchase**

& read your book now!



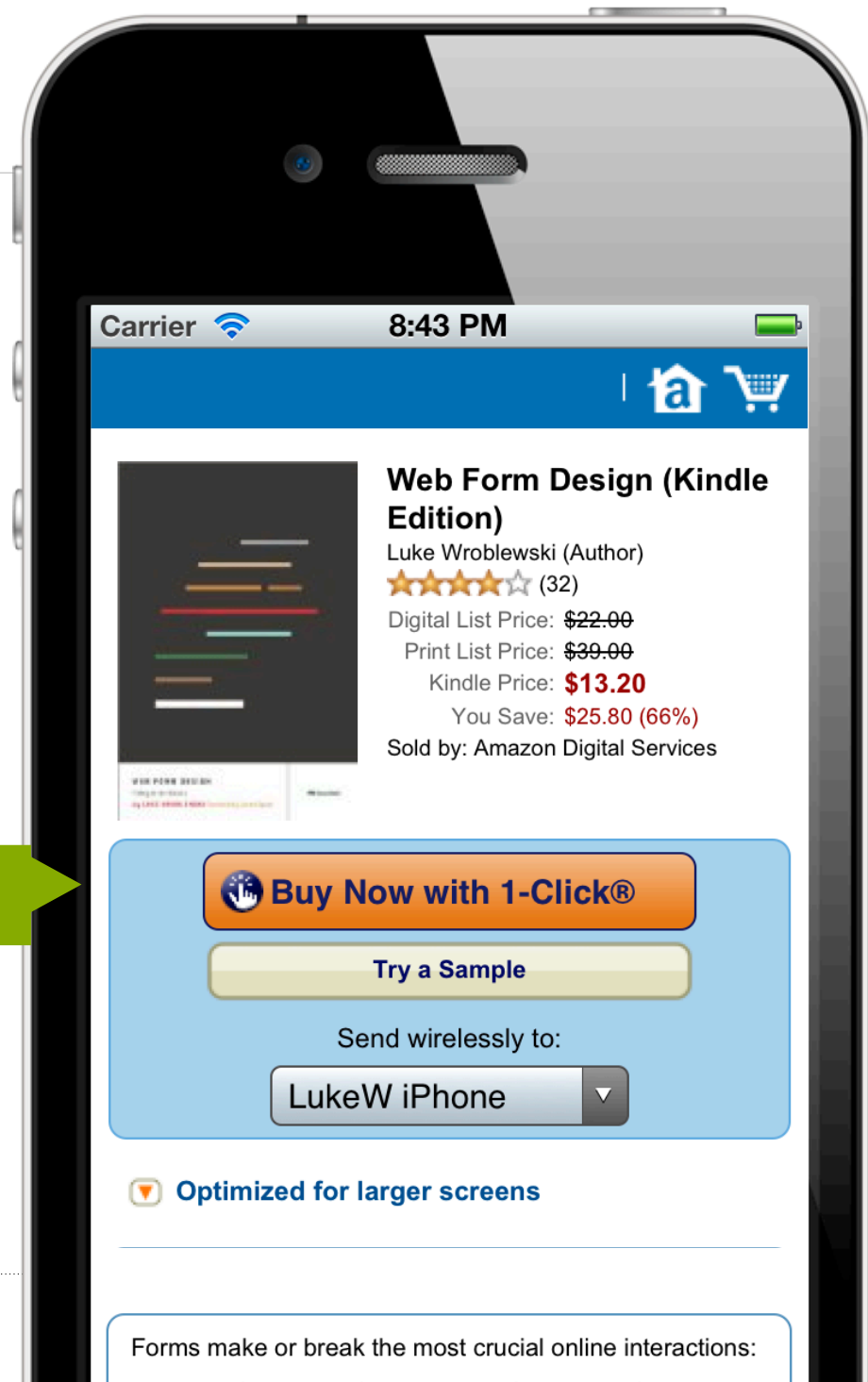
# One-Click

amazon.com  
Prime

130% more spent

20% of all US sales

1-Click Buying



**A**

Page 1 → Page 2 → Page 3

**Page 1**

Shipping Info

Label

Label

Label

☐ Option A  
☐ Option B  
☐ Option C

Label

Label

Label

Label

Continue Back

**Page 2**

Payment Info

Label

Label

Label

Label

Label

Label

☐ Option A  
☐ Option B

Label

Continue Back

**Page 3**

Review

Shipping Info

=====

Billing Info

=====

Submit Back

**B**

Page 1

Shipping Info

Label

Label

Label

☐ Option A  
☐ Option B  
☐ Option C

Label

Label

Label

Label

Payment Info

Label

Label

Label

Label

Label

☐ Option A  
☐ Option B

Label

Submit Back

**C**

Page 1

Shipping Info

Label

Label

Label

☐ Option A  
☐ Option B  
☐ Option C

Label

Label

Label

Label

Payment Info

Submit Back

Shipping Info

Label

Label

Label

Label

Label

Label

☐ Option A  
☐ Option B

Label

Submit Back

**D**

Page 1

Shipping Info

Label

Label

Label

☐ Option A  
☐ Option B  
☐ Option C

Label

Label

Label

Label

Continue Back

Payment Info

Shipping Info

Label

Label

Label

Label

Label

Label

☐ Option A  
☐ Option B

Label

Submit Submit

- All four versions delivered 100% pass rate
- Using a one page, multiple pages, or an inline multi-step form does not inherently impact completion
- So what does?

Name

Phone

Email

Comments

Send

- Compared: **11**-field vs. **4**-field Contact Us form
- **160%** increase in number of forms submitted
- **120%** increase in conversion ratio
- In addition, the quality of the submissions remained the same



- Clicked **Buy Now** but did not complete transaction
- Form had an optional field under Name titled Company
- **\$12M** of profit a year overnight
- Found 50 or 60 of these kinds of issues

### New Customers

**You do not need to create an account** to place an order. Just click Checkout As Guest to continue.

Reward Zone® program members: Create an account to earn points on your order.

CREATE ACCOUNT NOW >

CHECKOUT AS GUEST >

- Checkout form with 2 actions: Login or Register
- Changed Register to Continue with “you do not need an account to buy” message.
- **45%** increase in number of purchasing customers
- **\$1.5M** increase in first month
- **\$300M** increase in first year

Full Name\*

Email (your ClickTale username)\*

Password\*

Confirm Password\*

Phone Number - optional

☐ I have read and agree to the [Terms of Use](#)

Create New Account

- 6-field Contact form
- Added “**optional**” indicator on phone number field
- **2x** increase in conversion
- 42% conversion rate jumped to 80% conversion rate
- Required phone number field had 37% drop off rate

# Addresses

\*Last Name

\*Address

\*City

\*State  
Choose a state / province ▼

\*Zip Code  
 -  
4-digit Ext.

\*Daytime Phone Number

Remove optional  
fields

# Addresses

4 tap operation

The image shows a smartphone screen with a form for entering an address. The form has three input fields: "Last Name", "Address", and "City", each preceded by a red asterisk indicating it is required. Below the "City" field is a navigation bar with "Previous" and "Next" buttons on the left and a blue "Done" button on the right. Below the navigation bar is a province selection menu. The menu has a blue checkmark icon and the text "Choose a ...province". Below this text are two visible options: "AL" and "AK".

\*Last Name

\*Address

\*City

Previous Next Done

✓ Choose a ...province

AL

AK



# Addresses

still 4 taps

\*City

\*State

\*Zip Code  
 -

4-digit Ext.

Previous Next Done

Q W E R T Y U I O P  
A S D F G H J K L  
↑ Z X C V B N M ↵  
. ? 1 2 3 space return

# Addresses

cut down 2 fields

stepper

Street Address

Apt, Suite, Bldg. (optional)

ZIP Code

95124 San Jose, CA

Previous Next

1 2 3  
ABC DEF

4 5 6  
GHI JKL MNO

7 8 9  
PQRS TUV WXYZ

+ \* # 0

✕

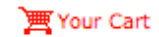
# Addresses

Stay on the keys

Address

ZIP Code

Enter ZIP for City & State



**Billing** > Shipping > Payment > Review Order

After entering your zip code above, you must select (click to highlight) your city/state combination from the display on the left. After selection, the city/state will auto-fill in the appropriate category.

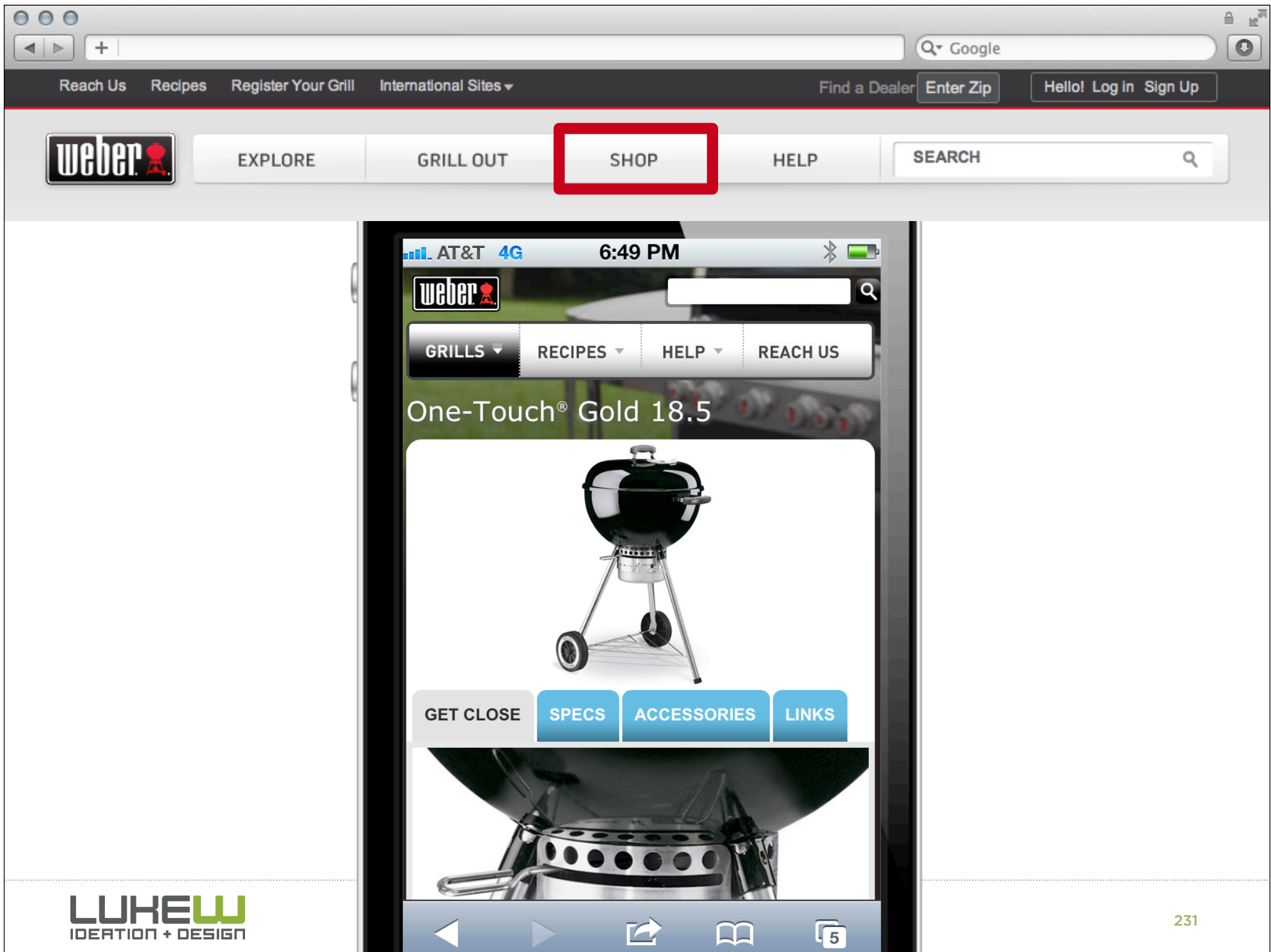
Shipping to the Contiguous United States,  
Hawaii, and Alaska only available at this  
time.

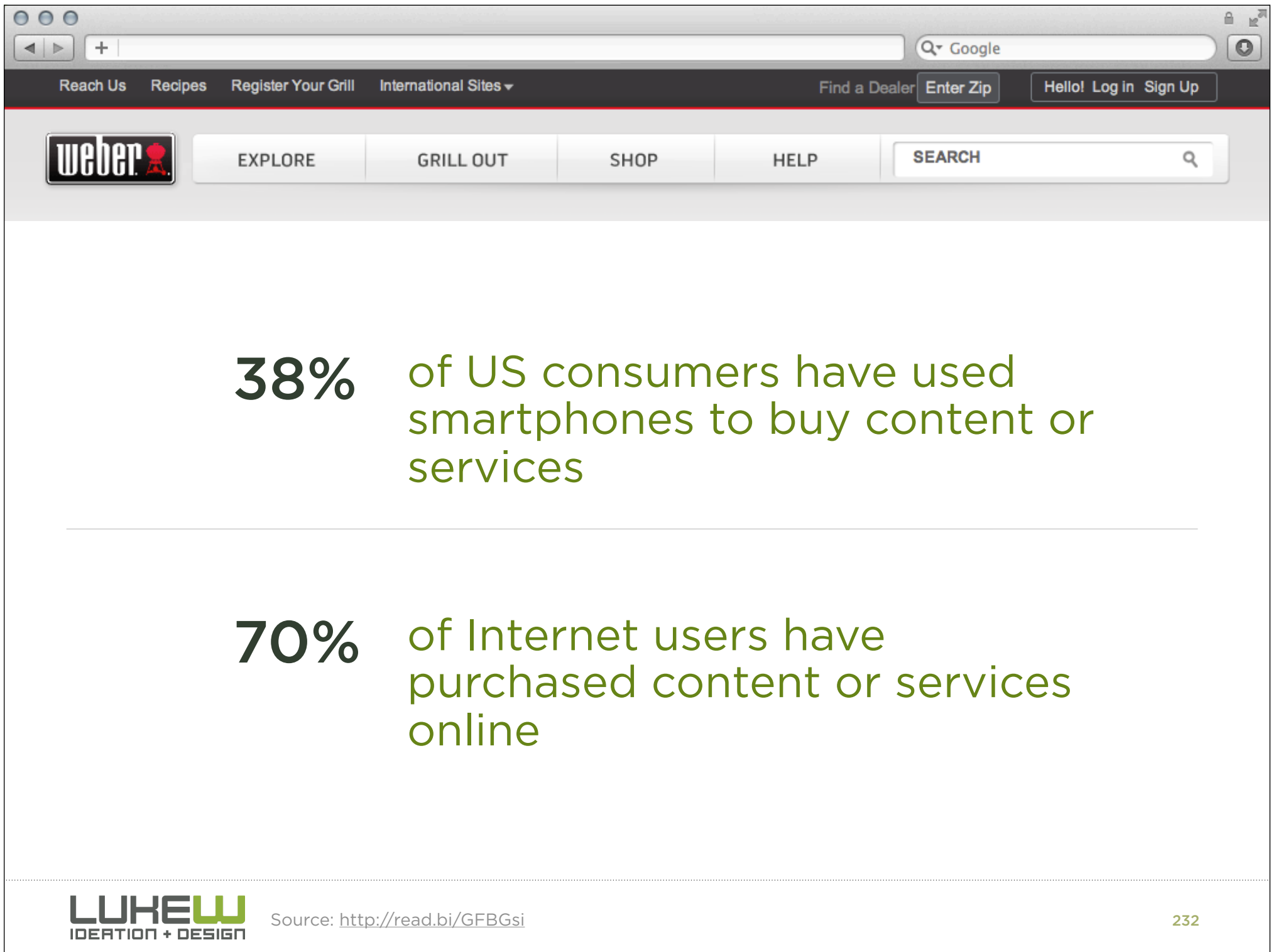
☐ Use this address as the shipping address

\* E-mail Address:

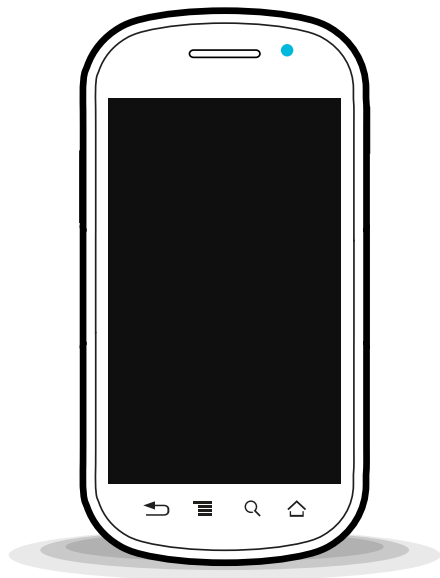
--

(for confirmation)





# METRICS



## MOBILE PURCHASES

**\$4B** 2011 mobile GMV

**3** purchases on  
mobile per sec

**700K** listings added on  
mobile per week

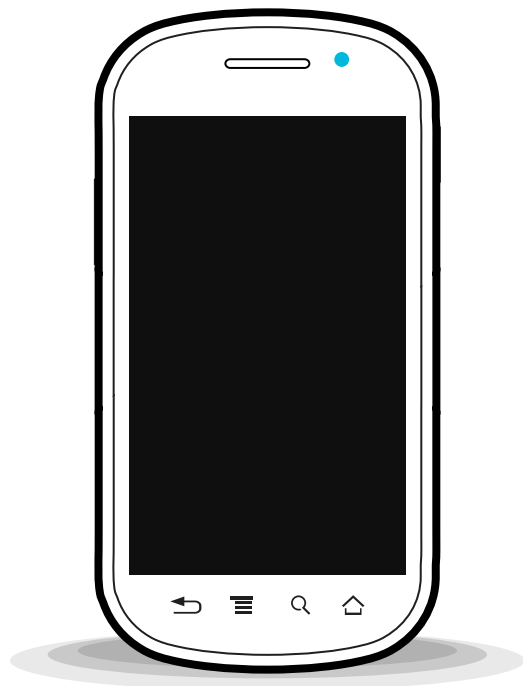
# FORMS

Me: Log In

Us: Checkout

You: Exercise





## SOFTWARE

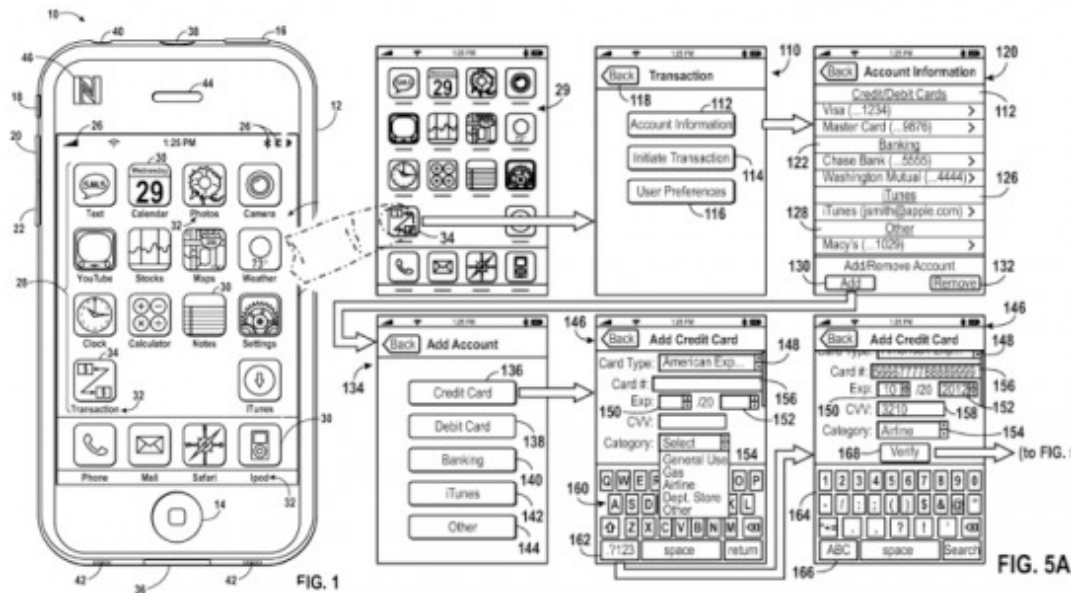
1. Constraints
2. Input fields, types, & more
3. Mobile forms

## HARDWARE

1. Capabilities
2. Rethinking forms

# Discussion

What have you been most amazed that your mobile device can do?



- Organize into groups of 3-4
- Discuss amongst yourselves
- Collaborate on a list of 5 answers



Word Lens -- iPhone App

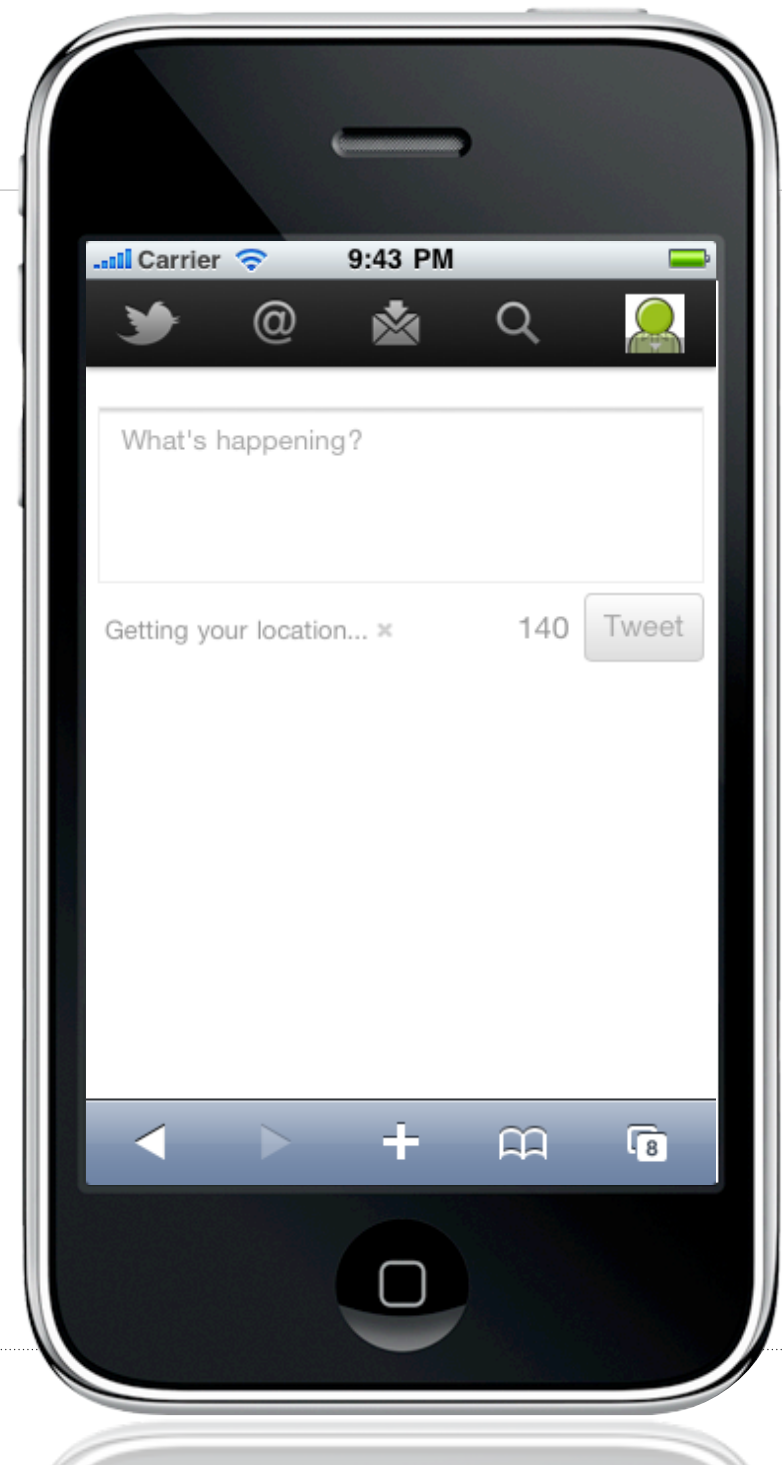
[QuestVisual.com](http://QuestVisual.com)

# Mobile Device Capabilities

---

- Location detection
- Multi-touch sensors
- Device positioning & motion: from an accelerometer
- Gyroscope: 360 Degrees of motion
- Orientation: direction from a digital compass
- Video & image: capture/input from a camera
- Dual cameras: front and back
- Audio: input from a microphone; output to speaker
- Ambient Light: light/dark environment awareness
- Proximity: device closeness to physical objects
- NFC: Near Field Communications through RFID readers
- Device connections: through Bluetooth between devices

# Location Detection



# Location Systems

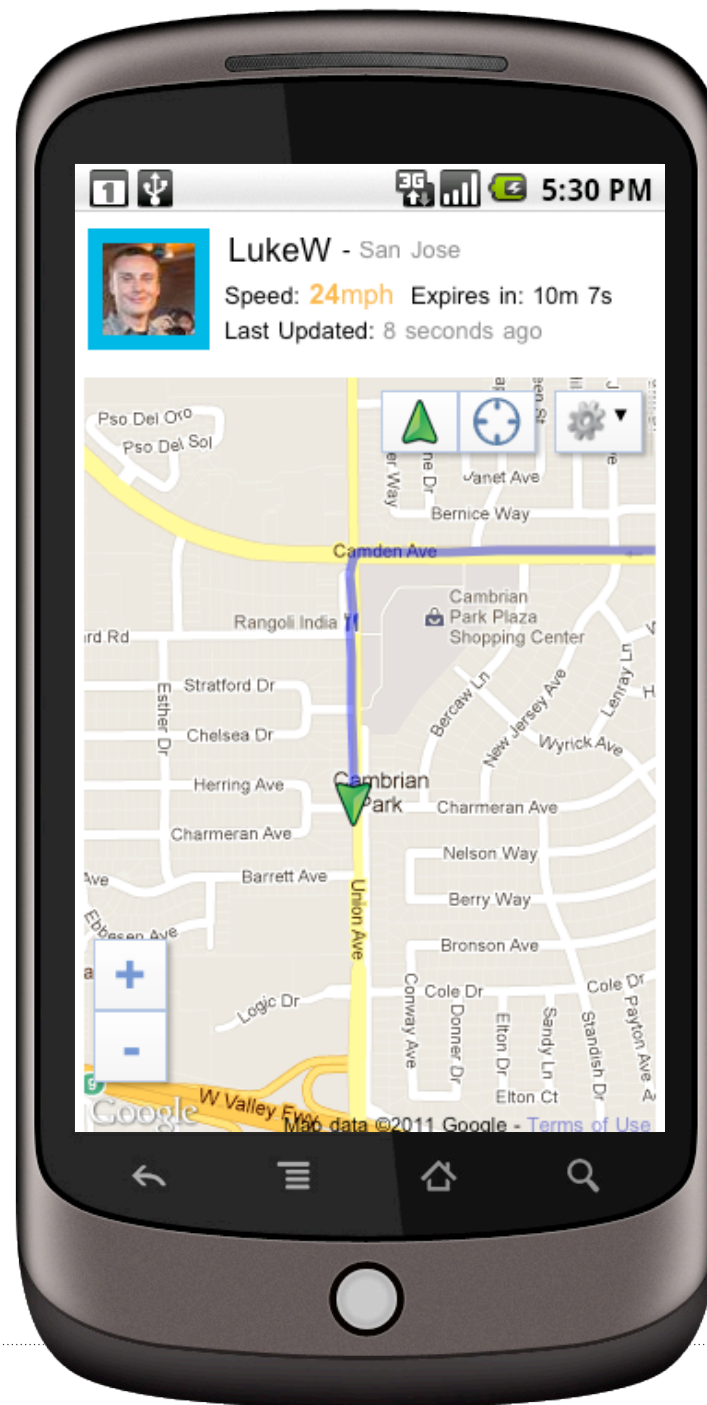
	Accuracy	Positioning Time	Battery Life
GPS	10m	2-10 minutes (only outdoors)	5-6 hours on most phones
WiFi	50m (improves with density)	Almost instant (server connect & lookup)	No additional effect
Cell tower triangulation	100-1400m (based on density)	Almost instant (server connect & lookup)	Negligible
Single Cell Tower	500-2500m (based on density)	Almost instant (server connect & lookup)	Negligible
IP	Country: 99% City: 46% US, 53% Intl ZIP: 0%	Almost instant (server connect & lookup)	Negligible

---

Smartphones: hybrid of GPS, Wifi, and cell tower triangulation

Laptops/desktops: WiFi, IP, rarely GPS

	GPS	Wi-Fi	Cell-ID
Providers	OEM (device + app)	Skyhook	Mobile Operators
Works on Devices Equipped with:	GPS	Wi-Fi	GSM/CDMA
Location Requirements	Requires clear line of sight	Within range of Wi-Fi networks <sup>1</sup> and cellular network <sup>2</sup>	Within coverage of cellular network
Coverage			
Outdoors			
Stationary			
Urban Corridors			
Cities			
Non-Urban Areas			
Moving			
Pedestrian			
Vehicle			
Indoors			
Accuracy/Precision (when in coverage)			
Time to Locate			
Time to First Fix			
Time to Recalculate			
Cost			
Device			
Lookup by Service Provider			
Battery Drain			

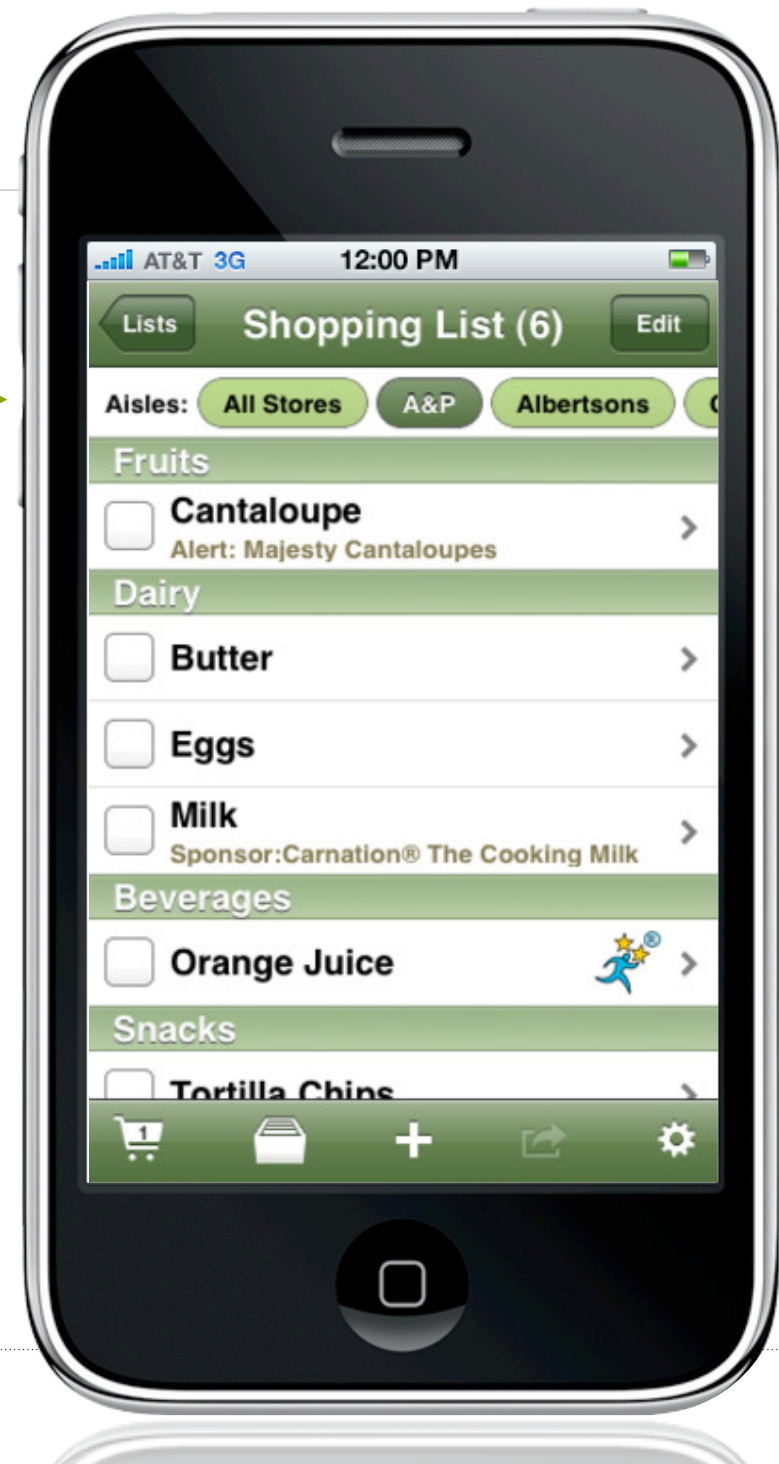


## Location Detection

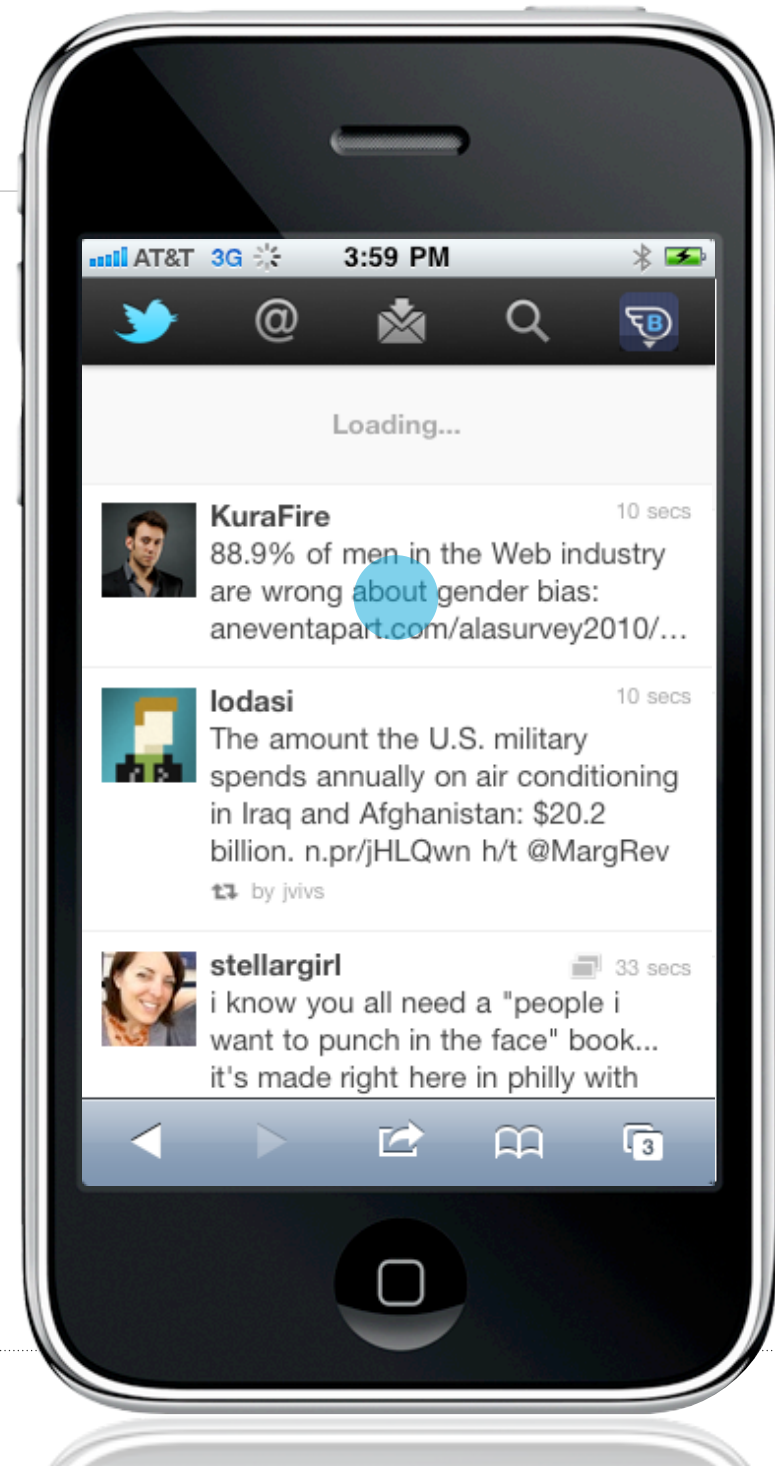


# Location Detection

arrange list based on location



# Multi-Touch Sensors



# Touch Target Sizes

---

**44px/pt**



**44px/pt**

# Touch Targets

Bigger than you're comfortable with

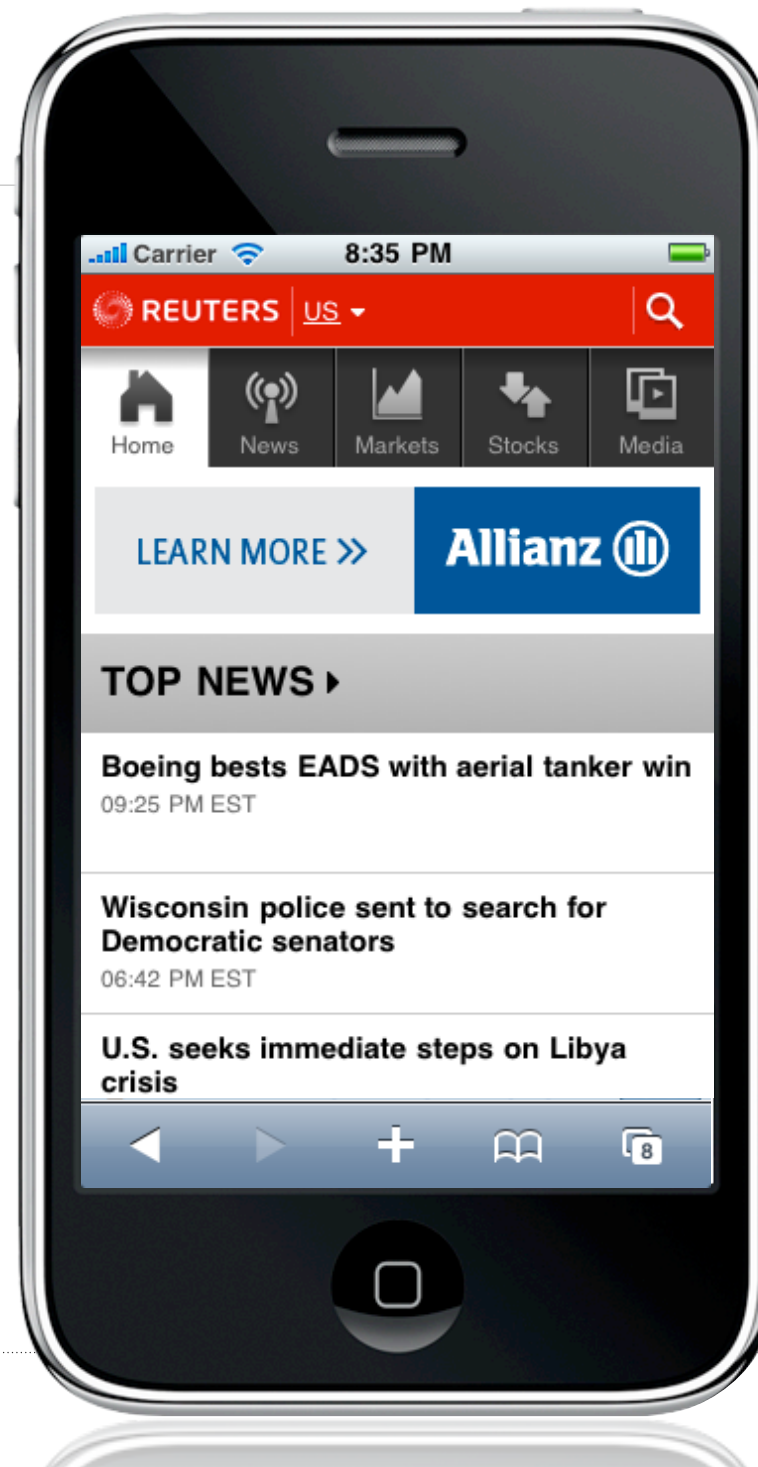


44px

44px

30px

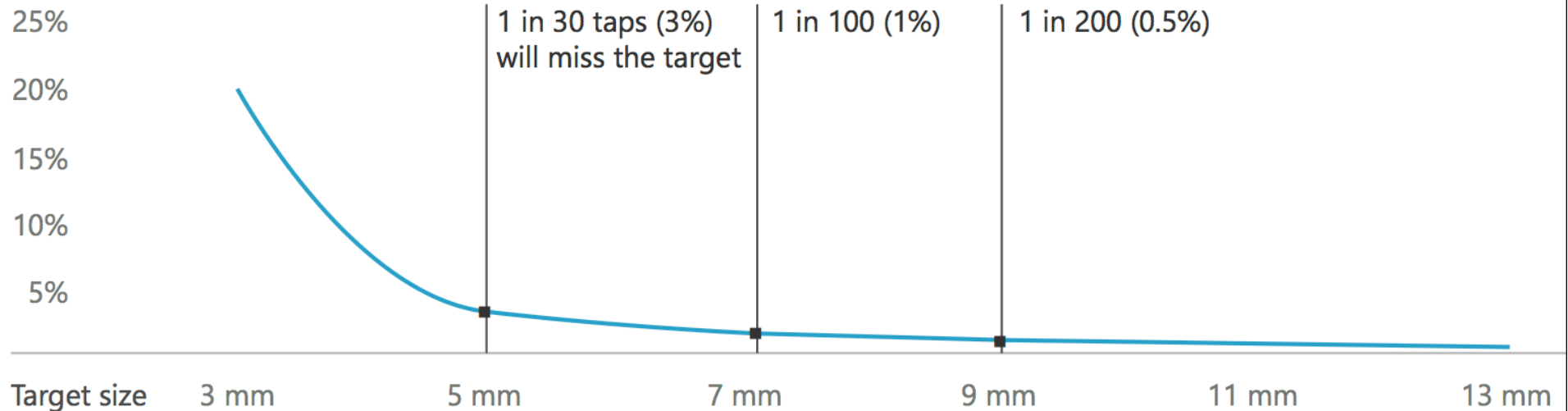
# Touch Targets

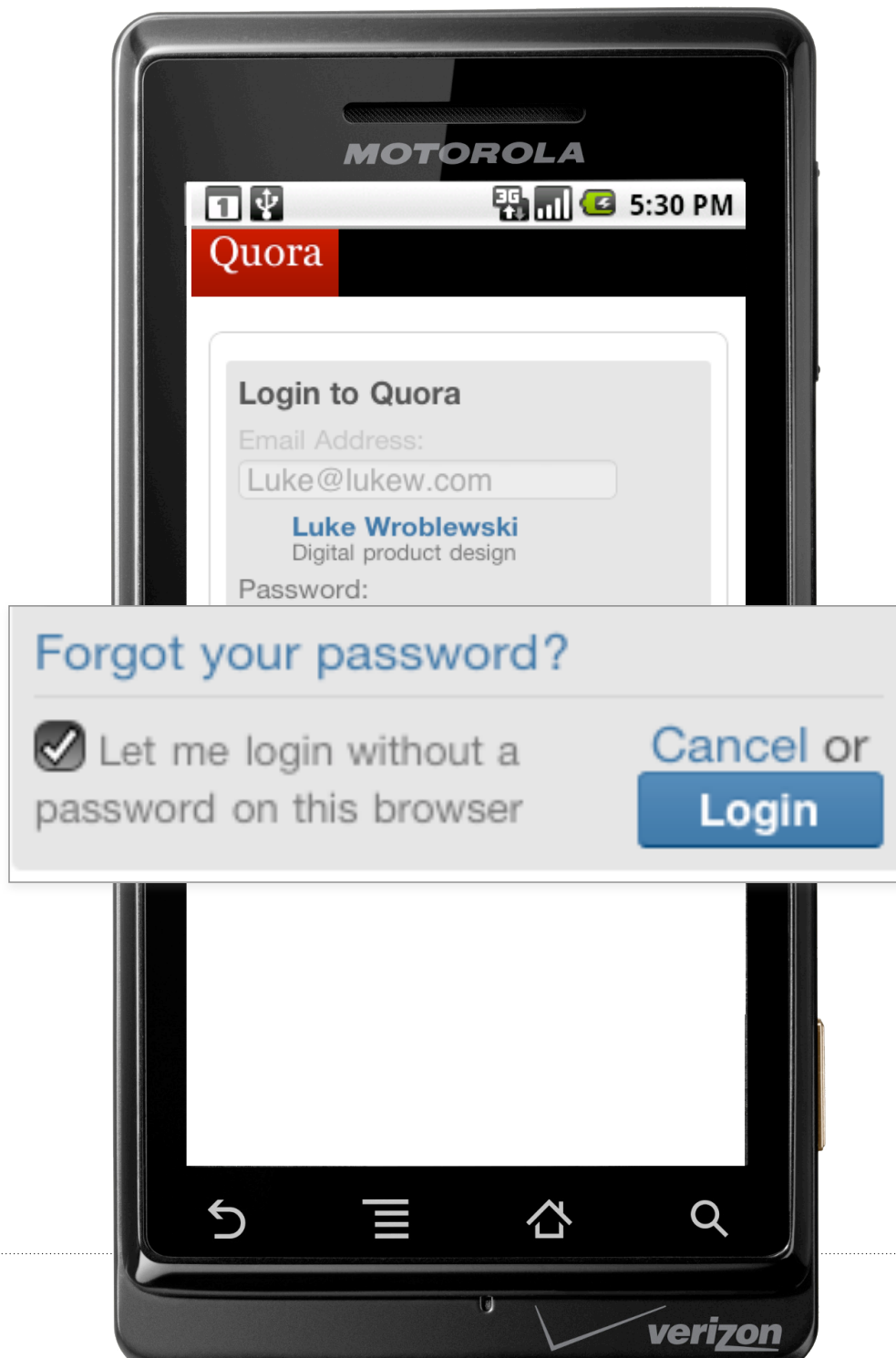


30px  
44px

# Target Size Influences Error Rate

% OF MISSED TAPS





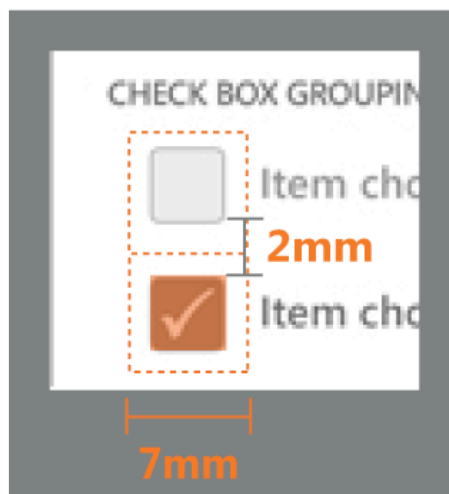
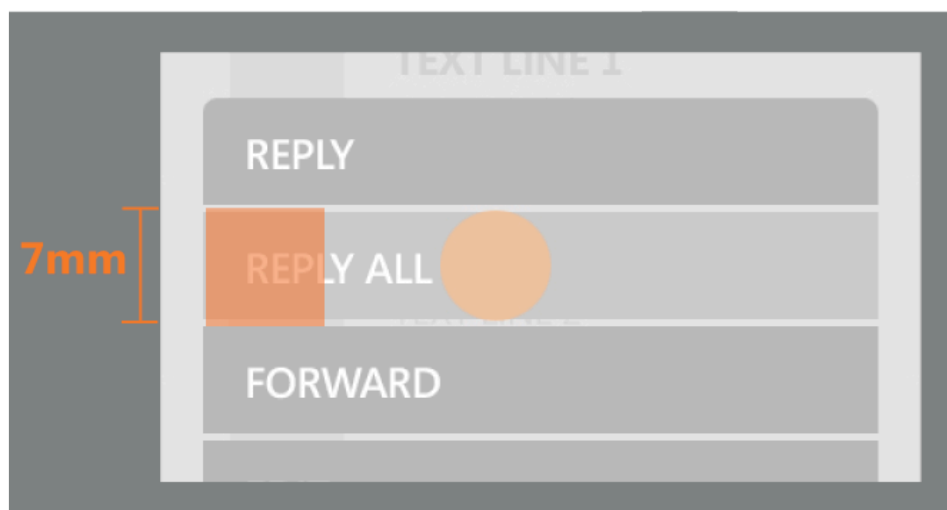
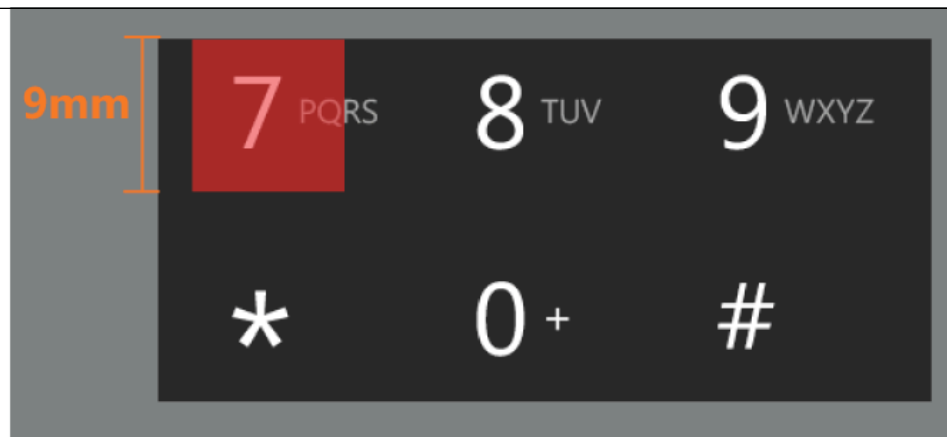


Recommended touch target size is **9mm/34px**

Minimum touch target size is **7mm/26px**

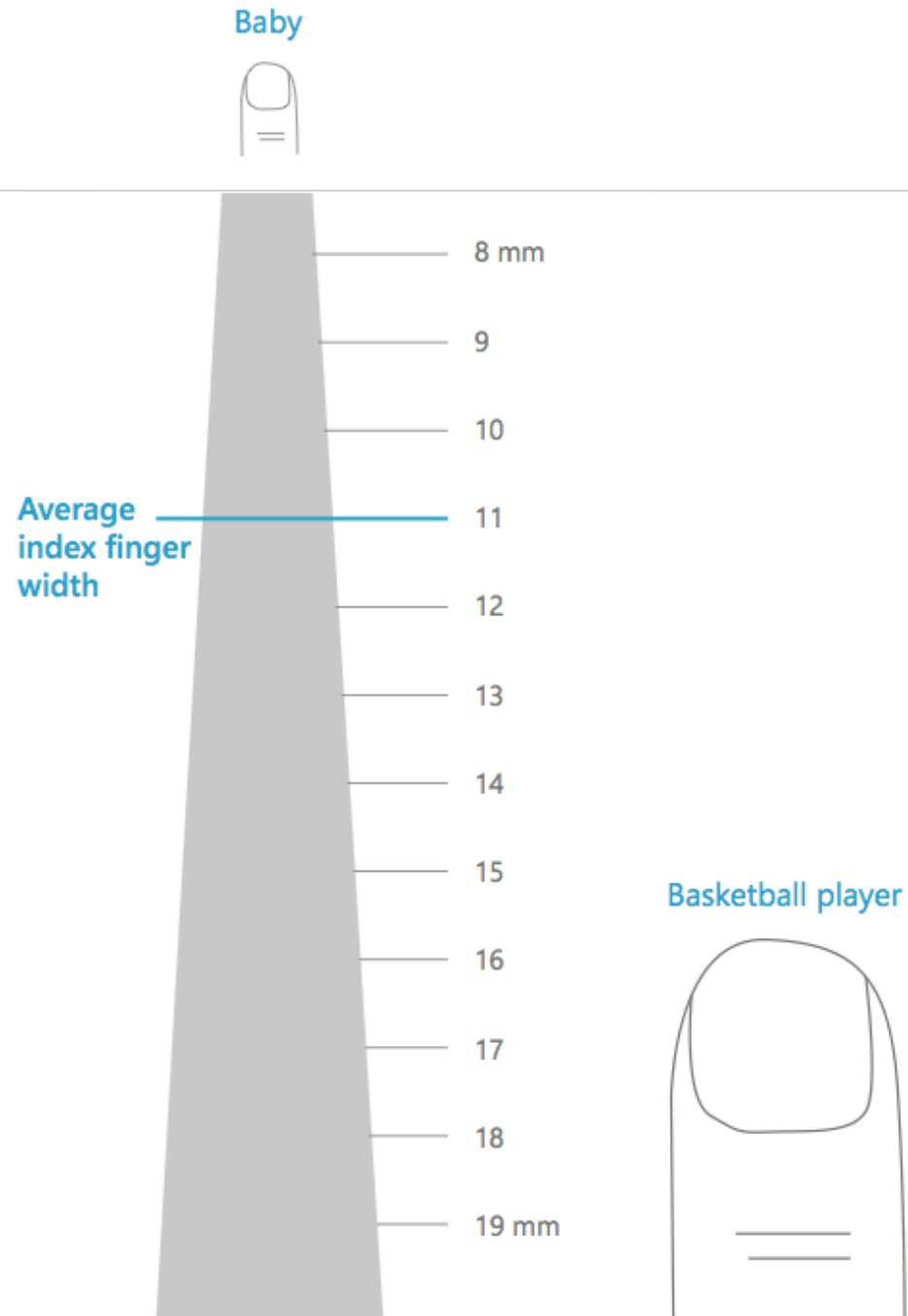
Minimum spacing between elements is **2mm/8px**

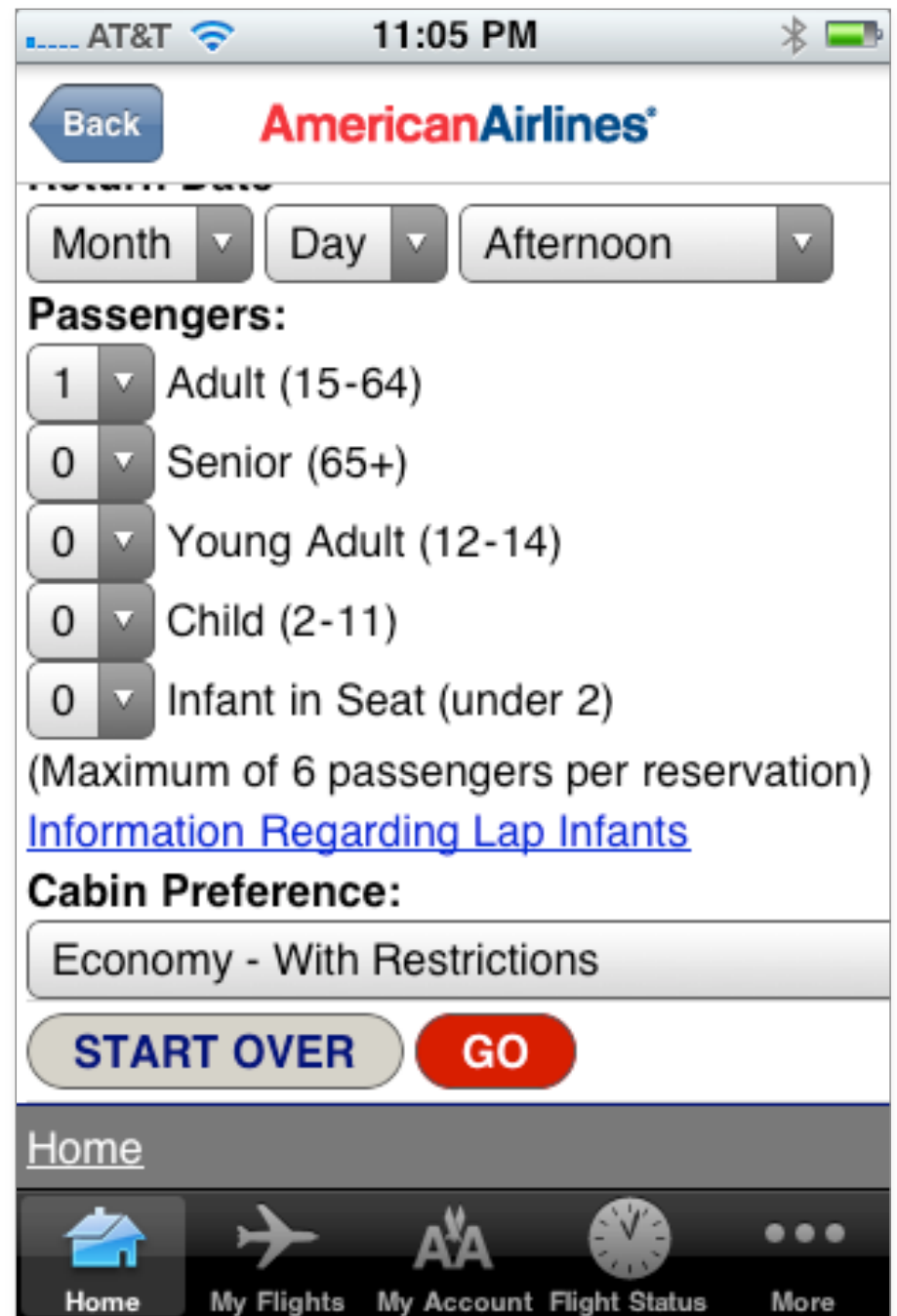
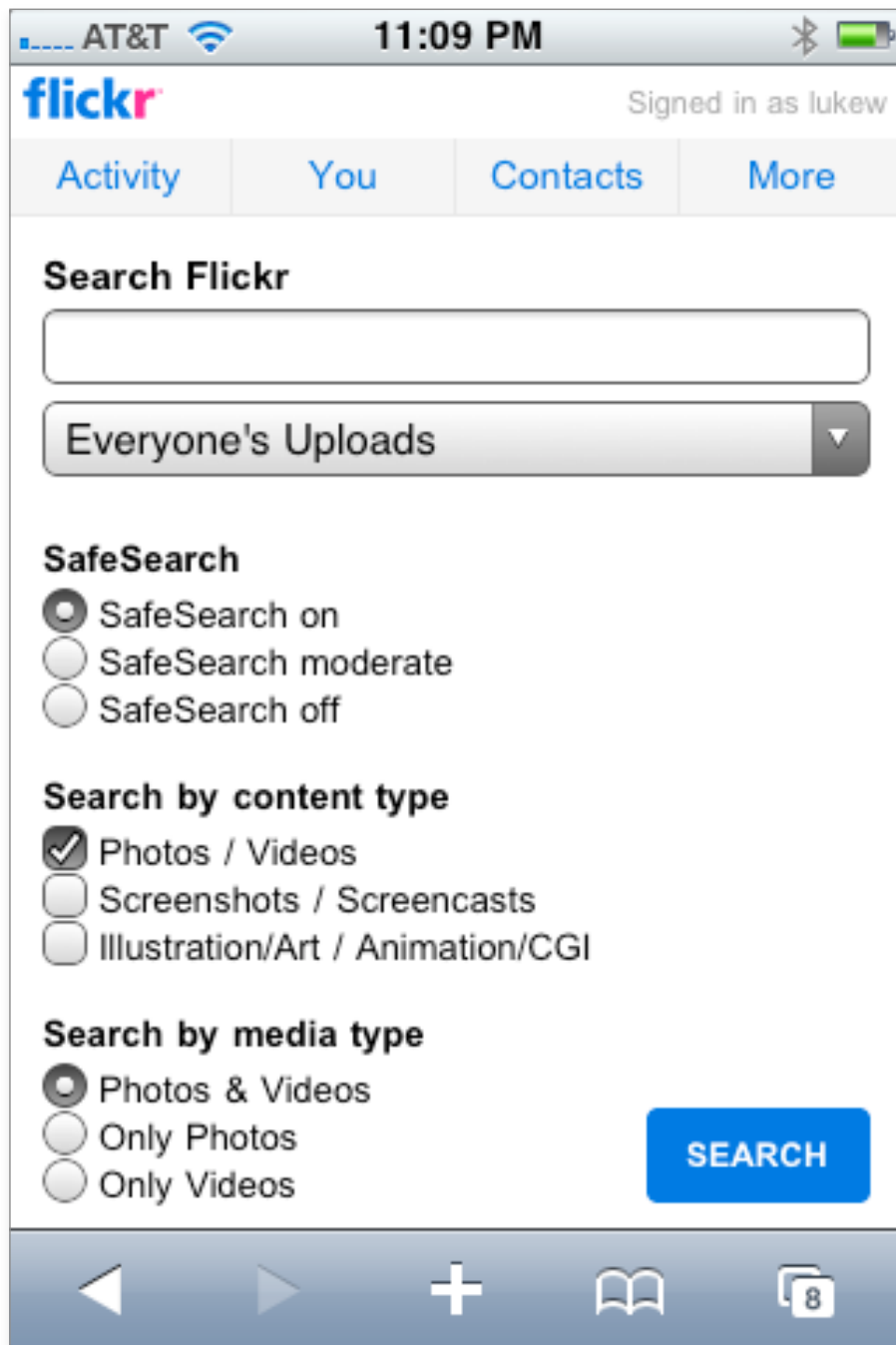
Visual size is **60-100%** of the touch target size



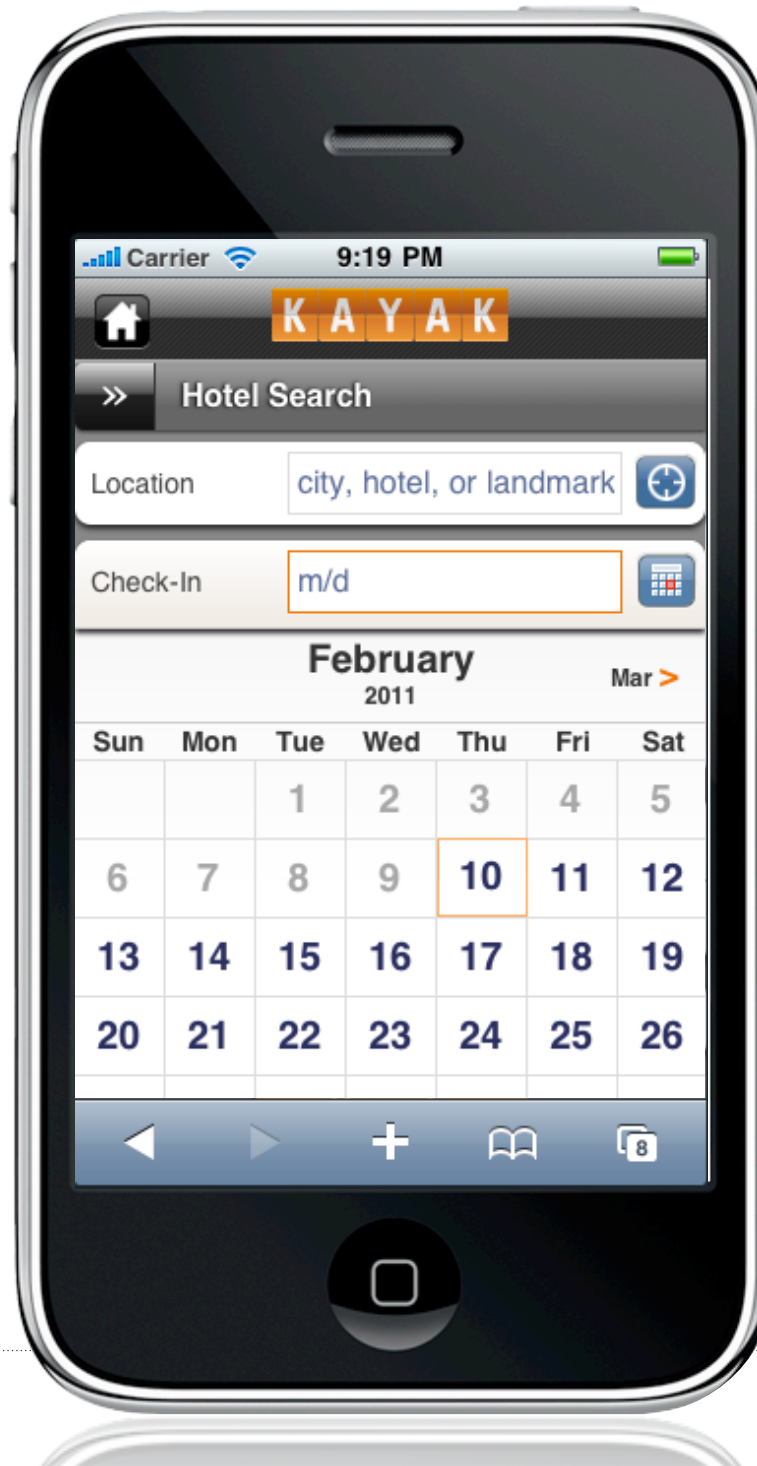


# Fat Fingers





Steppers



Touch Target Sizes



**80-90%** of people are right handed

# TOUCH TARGETS

---

- Mobile devices moving to touch UI
- Use appropriately sized targets
- Maintain spacing between targets
- Place important actions in easy to reach locations (ergonomics)

## Touch Gestures

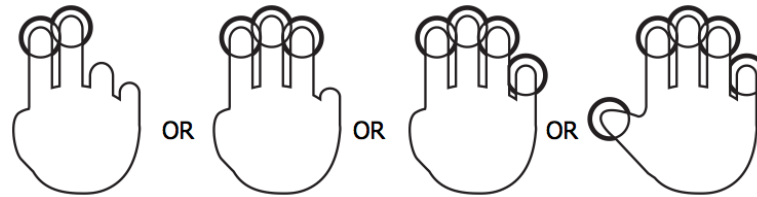
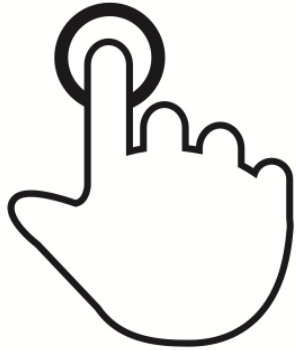
Tap  
Double Tap  
Drag  
Flick  
Pinch  
Spread  
Press  
Press & Tap  
Press & Drag  
Rotate

## Platforms

iPhone OS  
Android  
Web OS  
Windows Phone 7  
OS X  
Windows 7  
RIM 6.0  
Ubuntu  
And more...

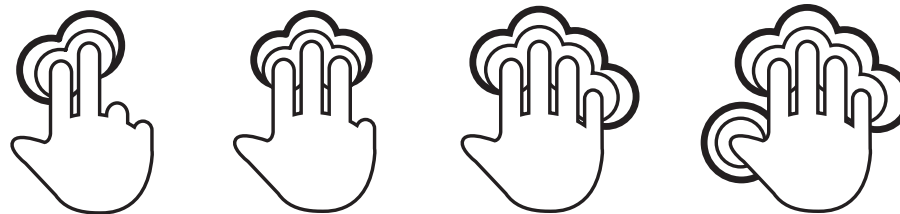
# Tap

Briefly touch surface with fingertip.



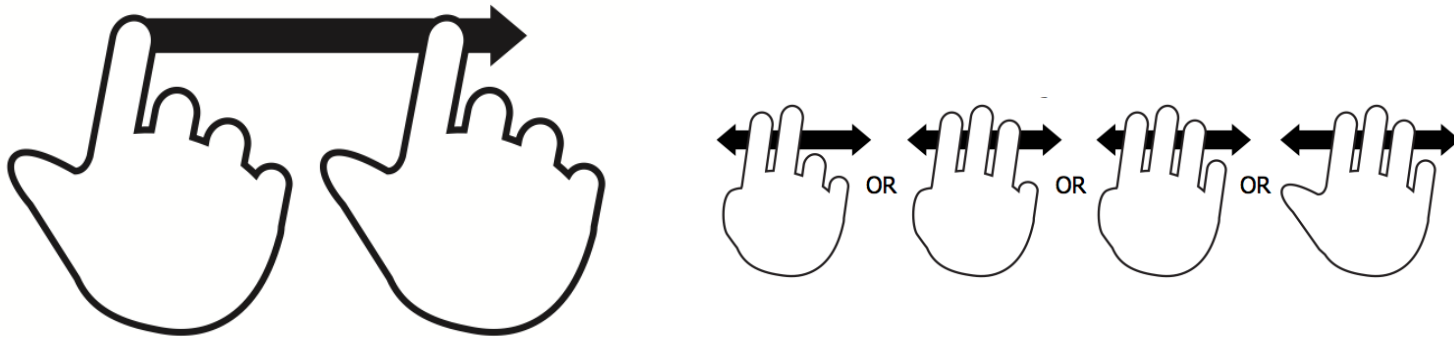
# Double Tap

Rapidly touch surface twice with fingertip.



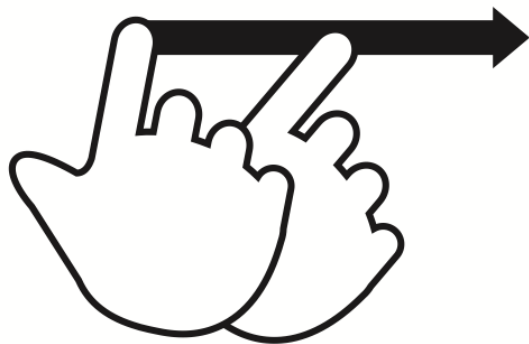
# Drag

Move fingertip over surface without losing contact.



# Flick

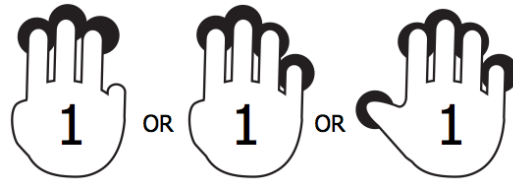
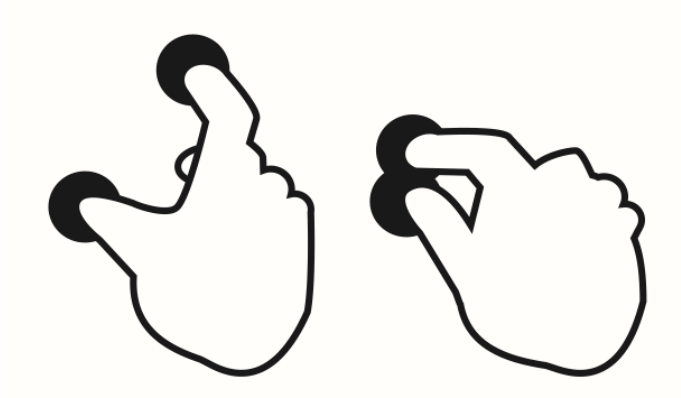
Quickly brush surface with fingertip.





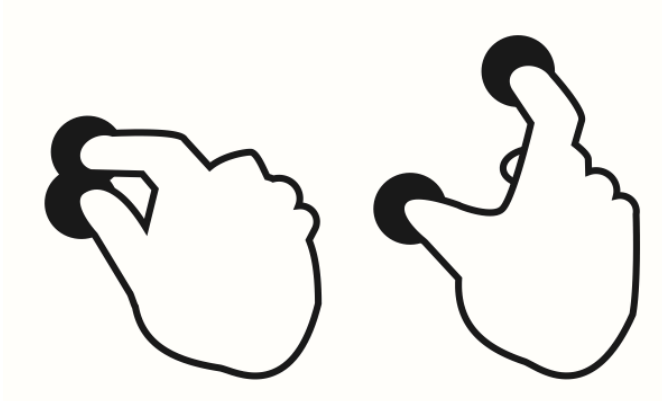
# Pinch

Touch surface with two fingers and bring them closer together.



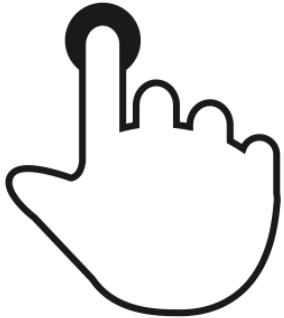
# Spread

Touch surface with two fingers and move them apart.



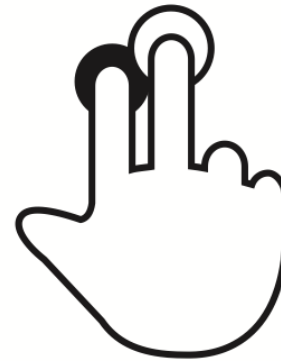
## Press

Touch surface for extended period of time.



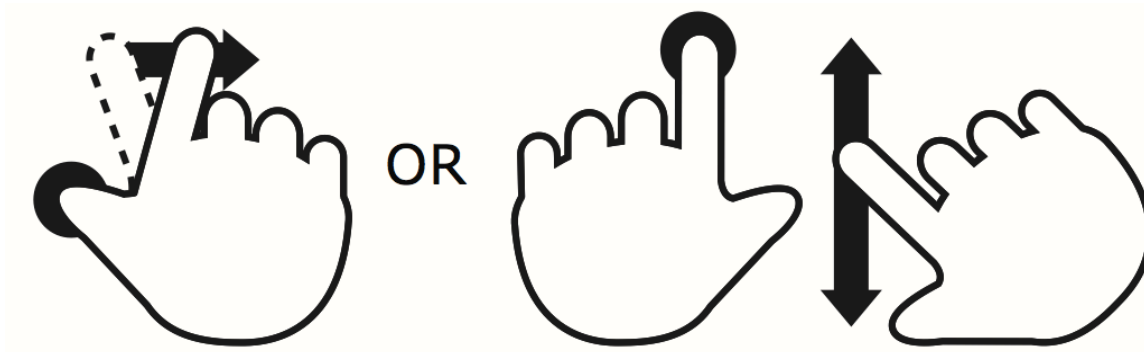
## Press & Tap

Press surface with one finger and briefly touch surface with second finger.



## Press & Drag




Press surface with one finger and move second finger over surface without losing contact.




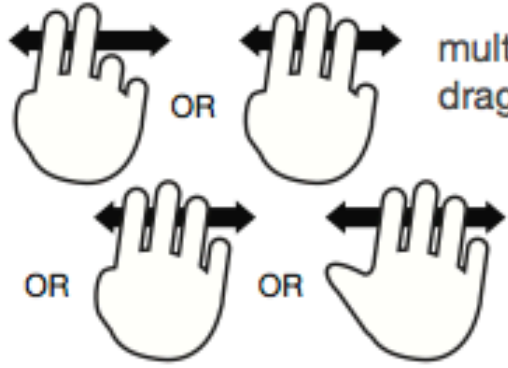




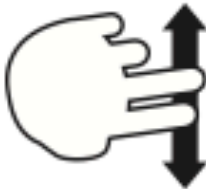


# Rotate

Touch surface with two fingers and move them in a clockwise or counterclockwise direction.



user action	gesture	description
<b>Change mode</b>	 press	Touch surface for extended period of time
<b>Open</b>	 double tap	Rapidly touch surface twice with fingertip
<b>Select</b>	 tap	Briefly touch surface with fingertip

user action	gesture		description
<b>Delete</b>		drag (across item or off-screen)	Move fingertip over surface without losing contact
<b>Duplicate</b>		tap (source and destination)	Touch object, then touch elsewhere on surface
<b>Move</b>		drag (and drop)	Move fingertip over surface without losing contact
		multi-finger drag	Move two to five fingertips over surface without losing contact

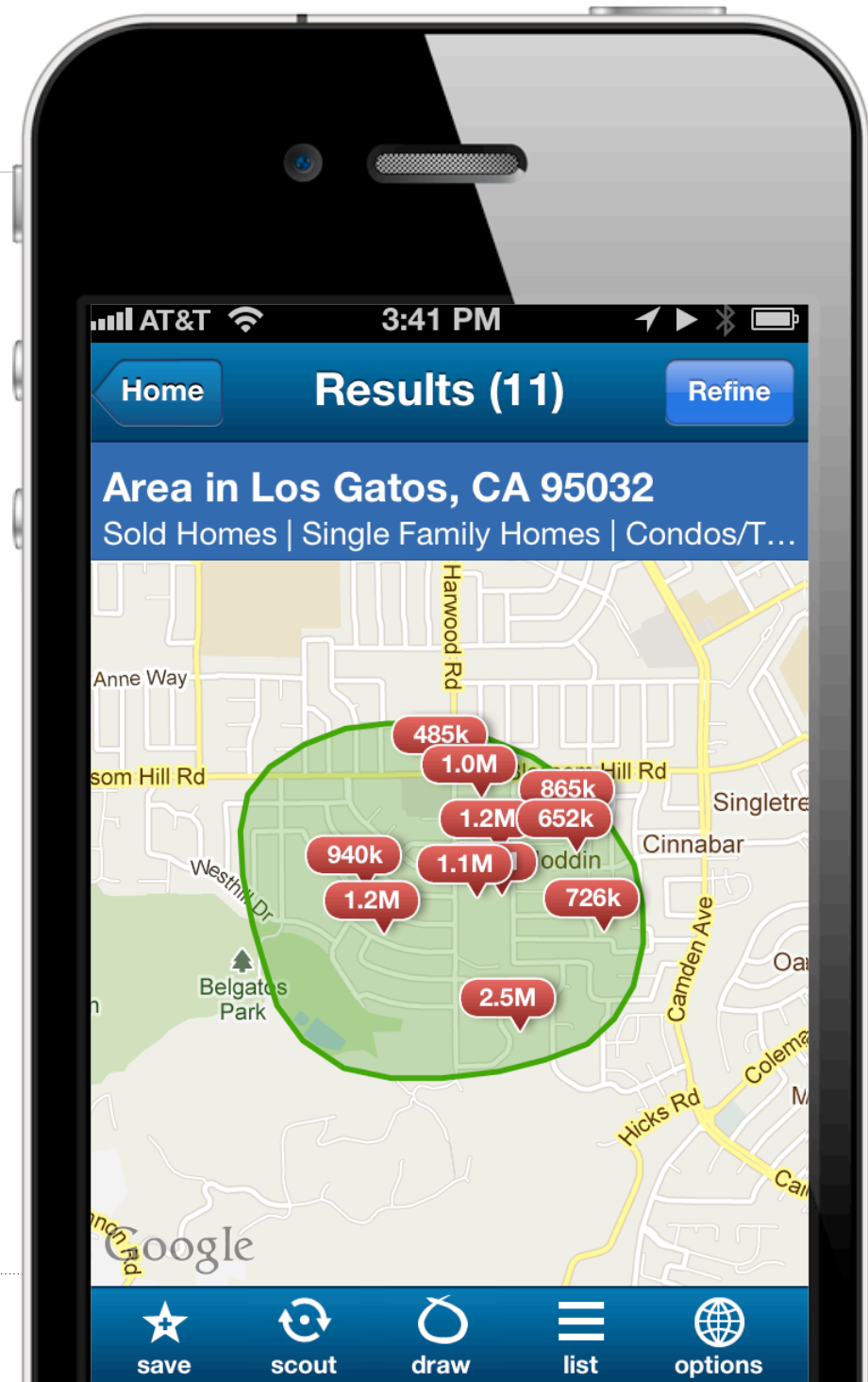
user action	gesture	description
<b>Pan</b>	 drag hand	Move fingers and palm of one hand over surface without losing contact
<b>Scroll</b>	 drag	Move fingertip over scrollbar without losing contact
	 two-finger drag	Move two fingers up or down across surface
	 press	Touch scrollbar for extended period of time
<b>Scroll (fast)</b>	 flick	Quickly brush surface with fingertip in the direction you want to scroll



[www.lukew.com/touch](http://www.lukew.com/touch)



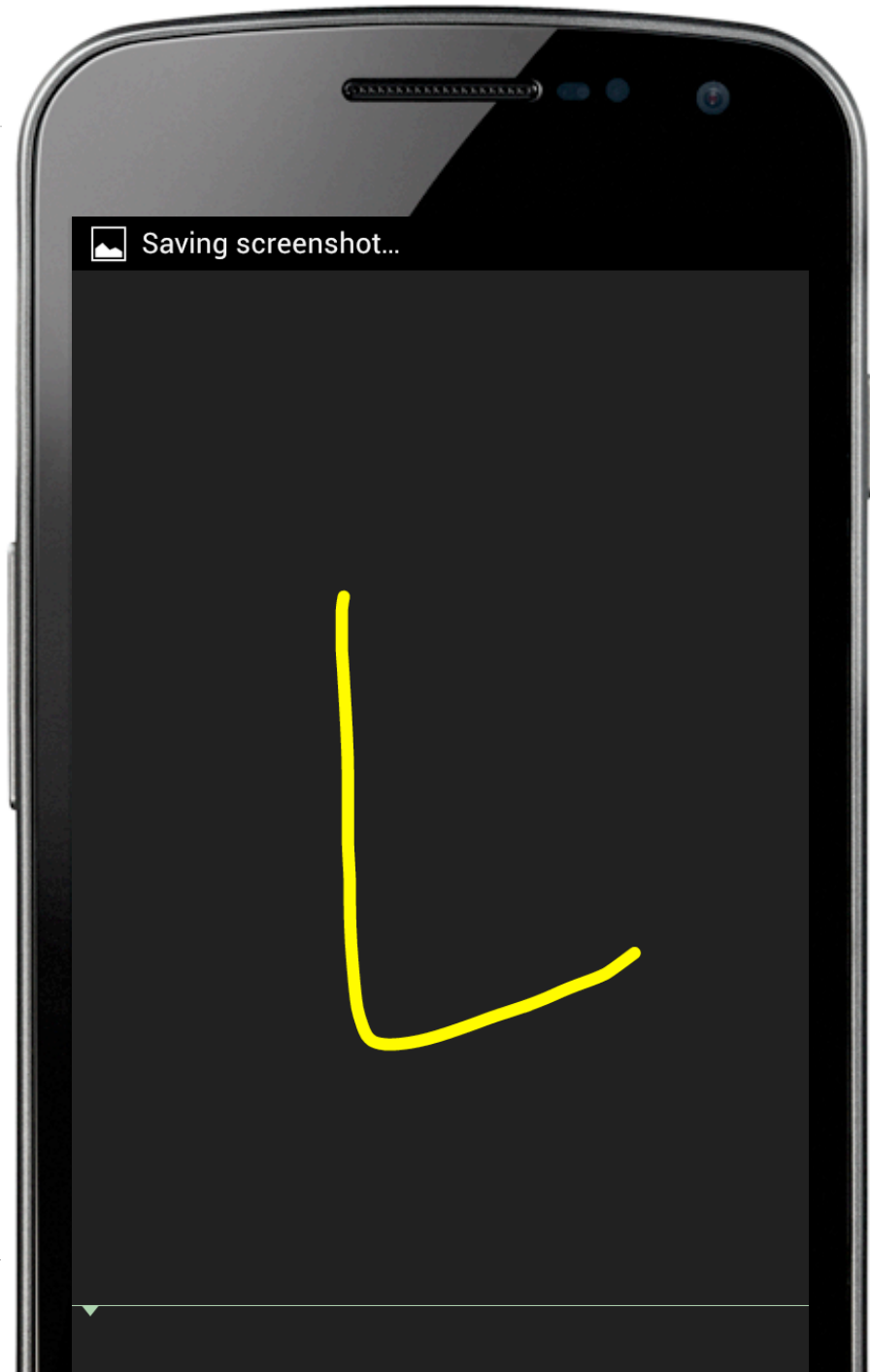
# Sketch a Search





# Gesture Search

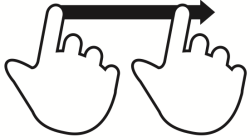
---





**Tap**

**Mobile Web**



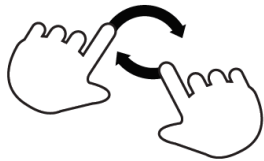
**Drag**

**Mobile Web**



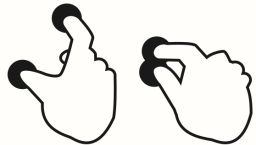
**Flick**

**Harder**



**Rotate**

**Harder**



**Pinch/Spread**

**Used by Browser**



**Double Tap**

**Used by Browser**

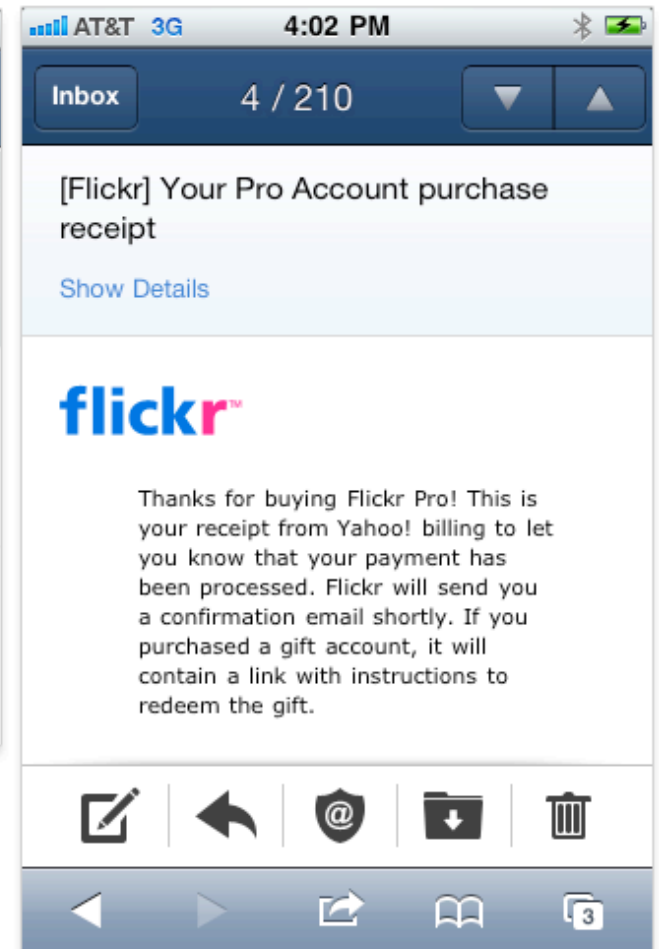
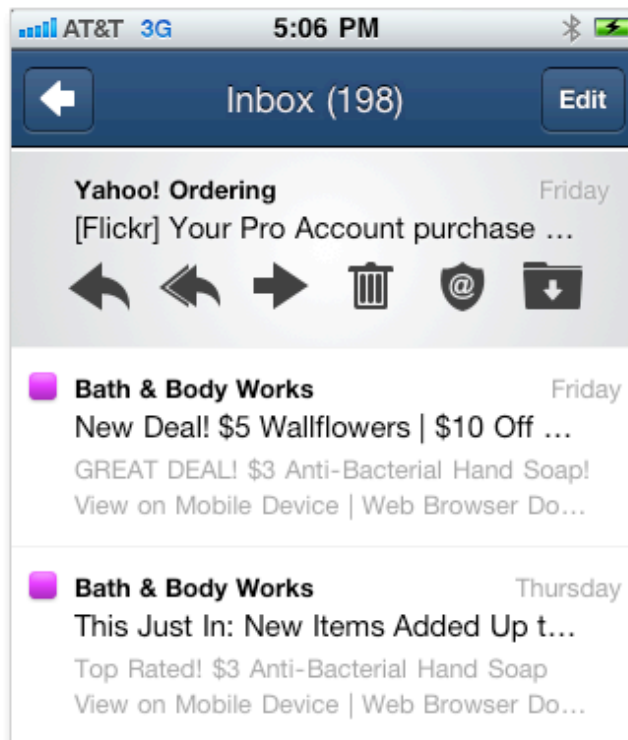
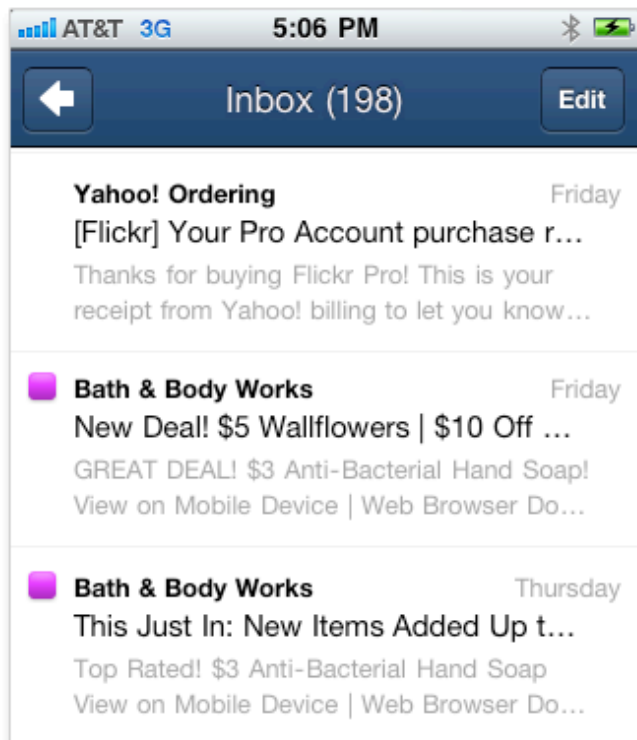


**Press Gestures**

**Used by Browser**

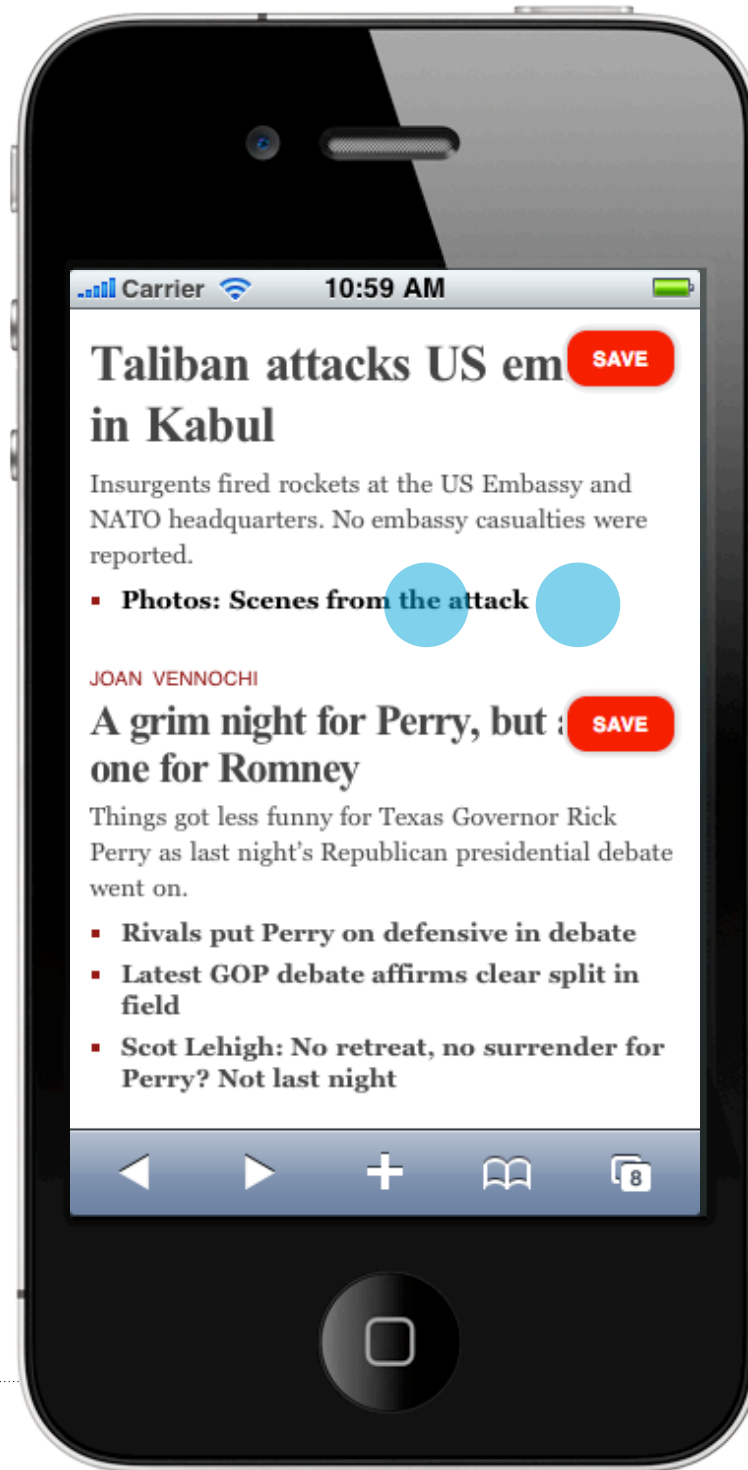
# Drag to Reveal





# Drag to Reveal





# Discovering Gestures

---

1. Just-in-time Education
2. Content Teases
3. Animation Cues
4. Removal of other Options

# Just-in-Time Education

---



**Josh Clark**  
@globalmoxie

We learn best in the moment, by demonstration and practice. Interfaces should teach (coach!) in context. Just-in-time education. #bdconf

**3**  
RETWEETS

**4**  
FAVORITES



<http://bit.ly/qp7FiE>



from ZURB

# Axe

Grab a website and axe pieces you don't like



Axe It!

Watch our 83-second introduction to Axe, or learn more about Axe.

Axe is made by ZURB.  
ZURB is a close-knit team  
that helps companies  
design better websites,  
services and products  
online.

Check out some of our other fine apps  
that help you design better products.

**Pro Suite:** Notable, Verify, Resolve  
**Free Apps:** Axe, Bounce, Chop, Clue,  
Reel, Spur, Strike

ZURB is hiring:  
Designer  
Lead Editor

Axe © 2011 ZURB.  
All rights reserved.  
Learn more about Axe  
Follow Axe on Twitter

## Preparing the chopping block

Hang tight for just a few seconds as we get your screenshot ready.



Scribble to Axe



Tap & Hold to Comment



Scroll With Two Fingers

Axe is made by ZURB.  
ZURB is a close-knit team  
that helps companies  
design better websites,  
services and products  
online.

Check out some of our other fine apps  
that help you design better products.

**Pro Suite:** Notable, Verify, Resolve  
**Free Apps:** Axe, Bounce, Chop, Clue,  
Reel, Spur, Strike

ZURB is hiring:  
**Designer**  
**Lead Editor**

Axe © 2011 ZURB.  
All rights reserved.  
Learn more about Axe  
Follow Axe on Twitter

LUKEW  
IDEATION + DESIGN

## ABOUT

16 years of thought leadership and execution in digital product design.

[Learn About LukeW](#)

## WRITINGS

1,453 articles about the big picture and critical details behind online software.

[An Event Apart: The Responsive Design](#)[An Event Apart: The Responsive Design](#)[An Event Apart: The Responsive Design](#)

3 books on mobile Web usability, interaction, and visual design.

[Mobile First](#) 2011[Web Form Design](#) 2008[Software Engineering](#) 2002

## PRESENTATIONS

200 presentations and workshops at over 59 cities across the globe.


Feb 6-7, 2012

[An Event Apart -Atlanta, GA](#)

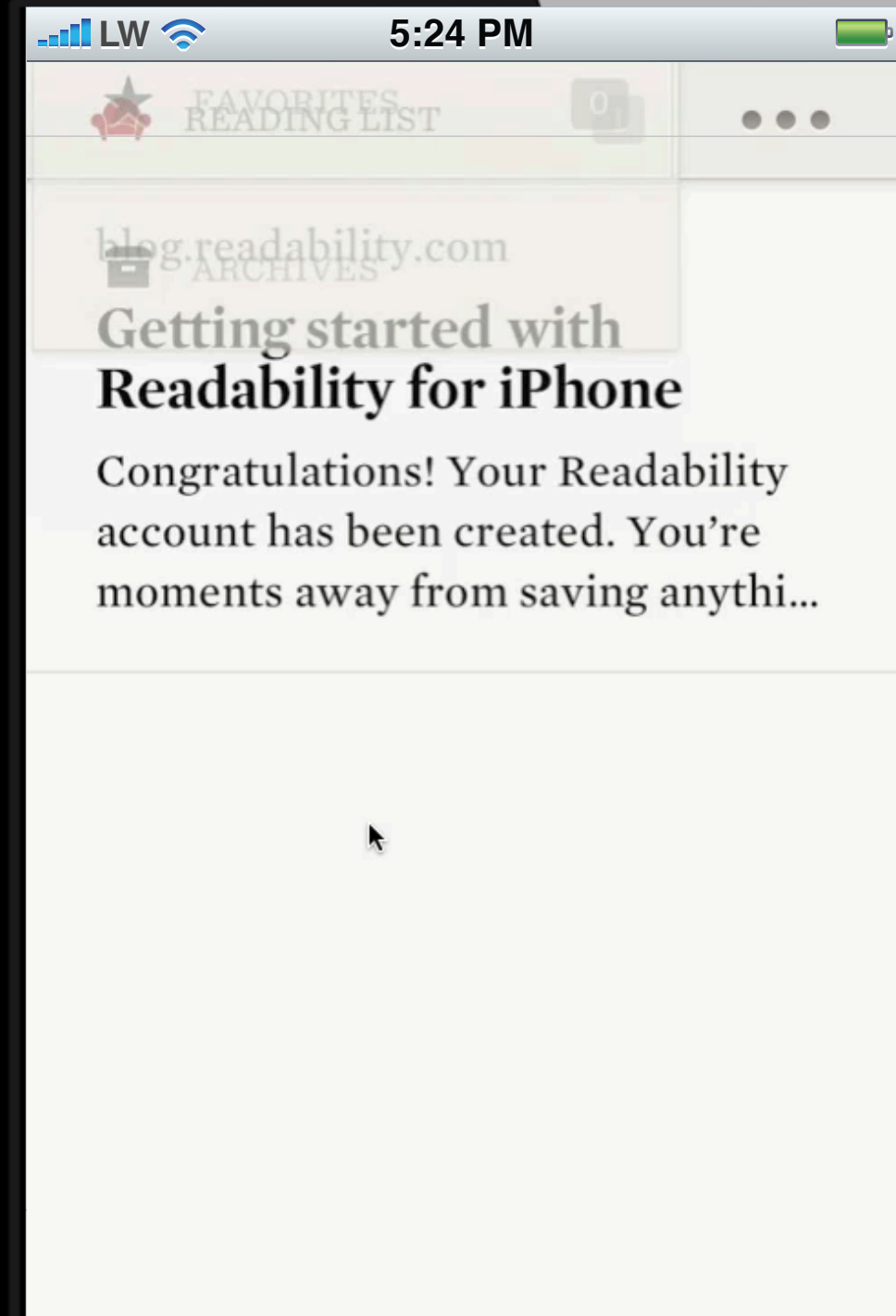
Feb 24, 2012

[Web à Québec -Québec, Canada](#)[See All...](#)

© Copyright 1996-2011 LukeW Ideation + Design unless otherwise indicated. Please [contact me](#) with any questions or comments.

  
Trying to Scroll?  
Use two fingers. UNDO LINE

# Just In Time



# Discovering Gestures

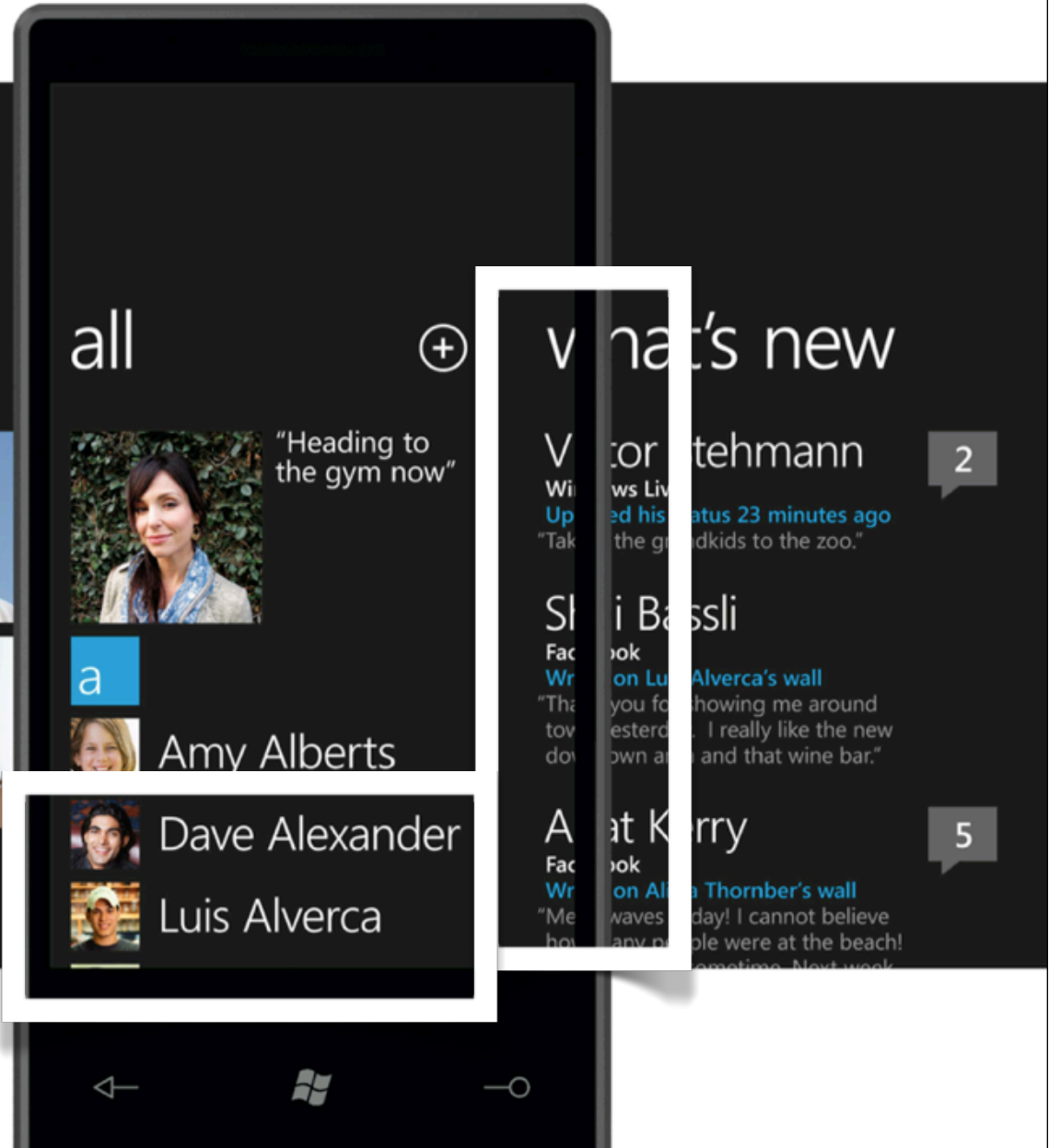
---

1. Just-in-time Education
2. Content Teases
3. Animation Cues
4. Removal of other Options

# Content Teases

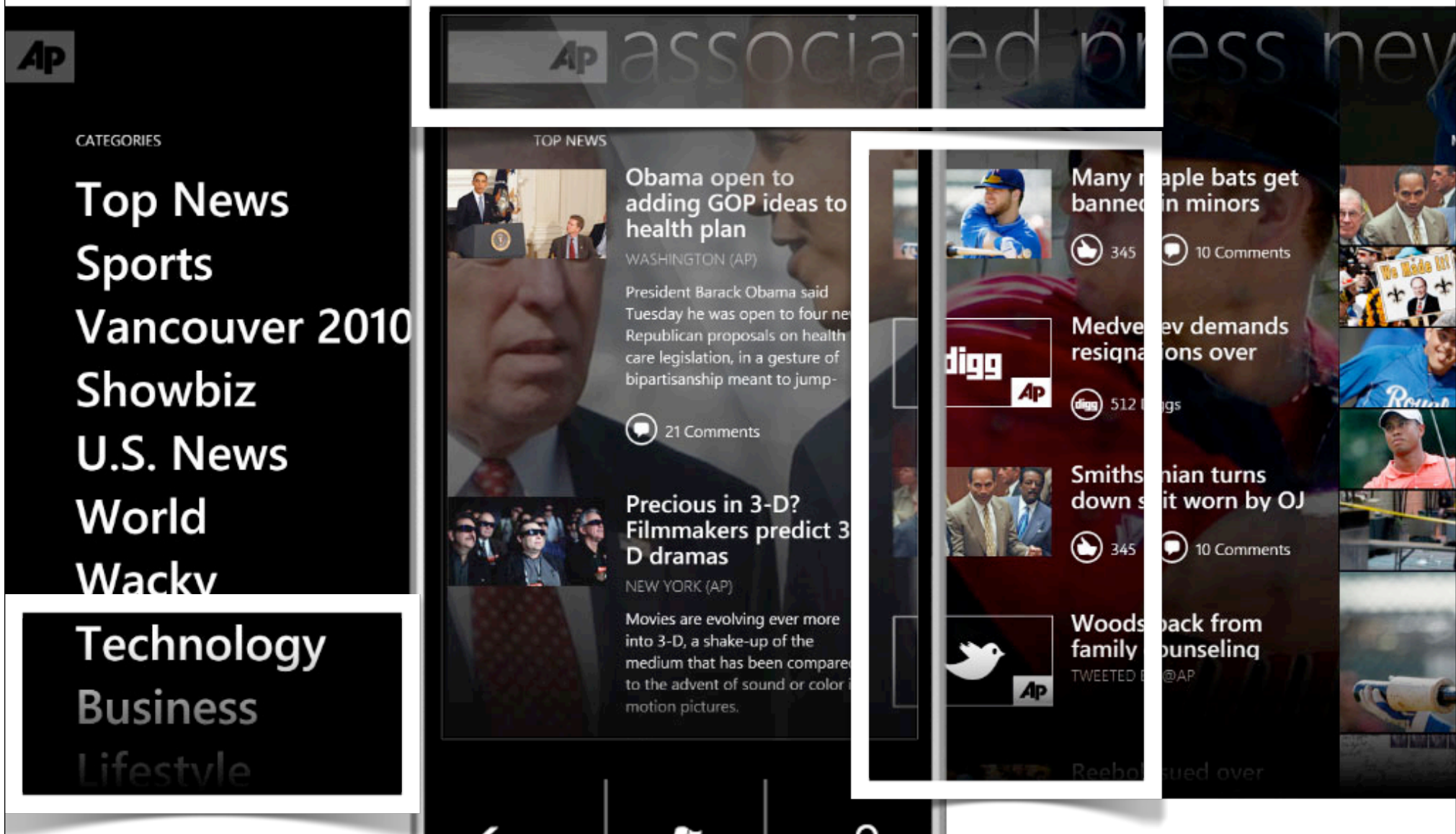
# people

## recent





# Teases

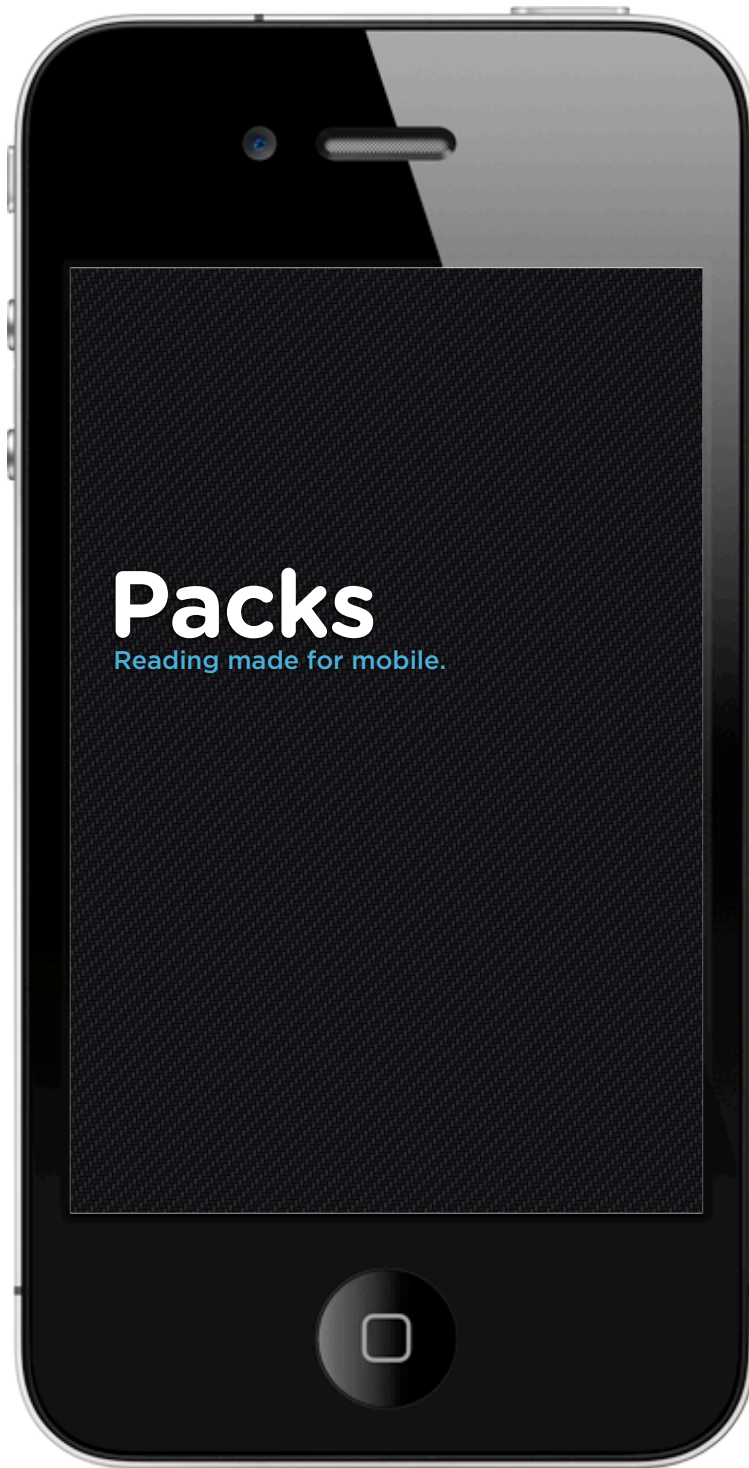


# Discovering Gestures

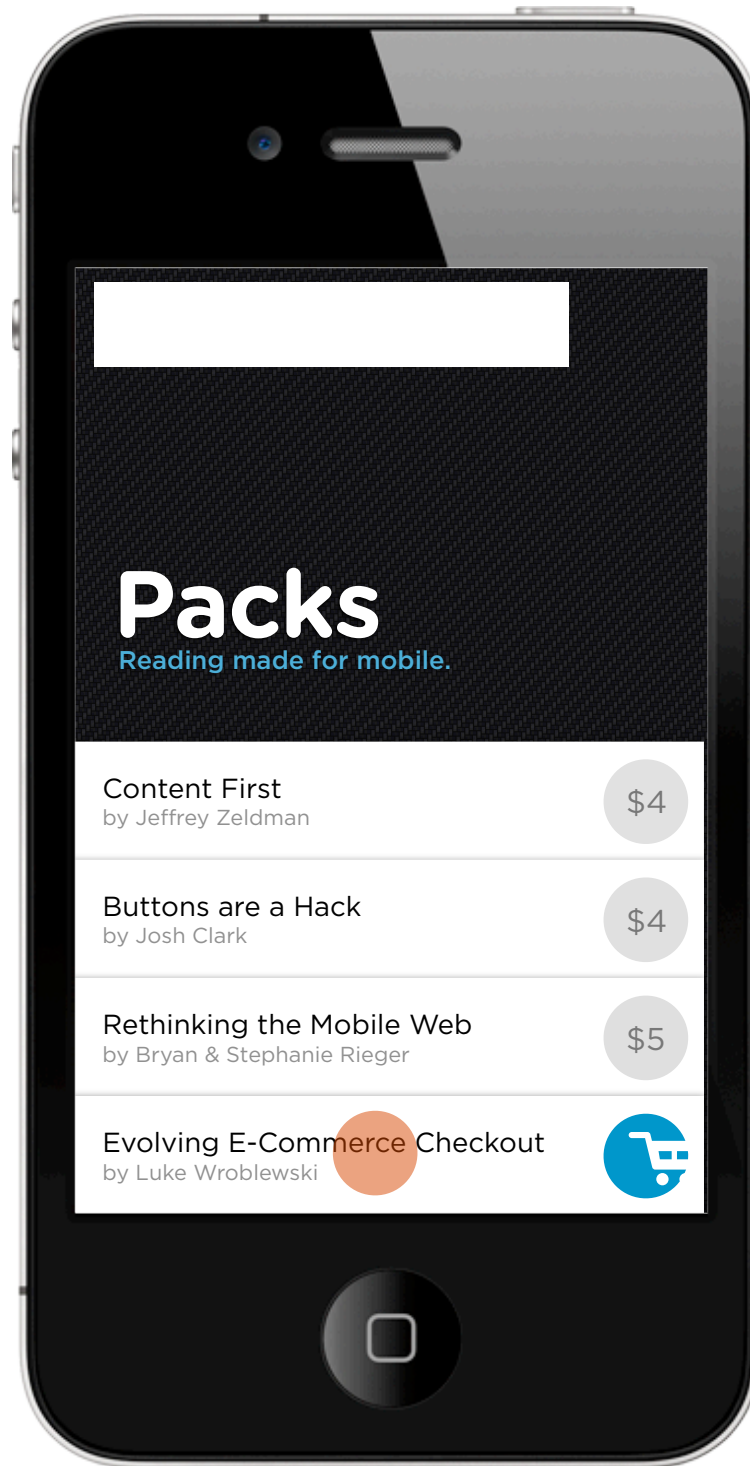
---

1. Just-in-time Education
2. Content Teases
3. Animation Cues
4. Removal of other Options





App Loads



Open a Pack



PACK 0

# **Evolving** E-Commerce Checkout

By Luke Wroblewski

NOV 2011

## INCREASING E-COMMERCE

1

Digital shopping shows no sign of letting up. Americans spent \$142.5 billion online in 2010 and e-commerce in the United States has seen **double digit growth** every quarter since. While an increase in total e-commerce buyers is one of the biggest reasons why, recent innovations in personal computing are poised to drive **digital** spending even higher.

### Y/Y E-COMMERCE GROWTH

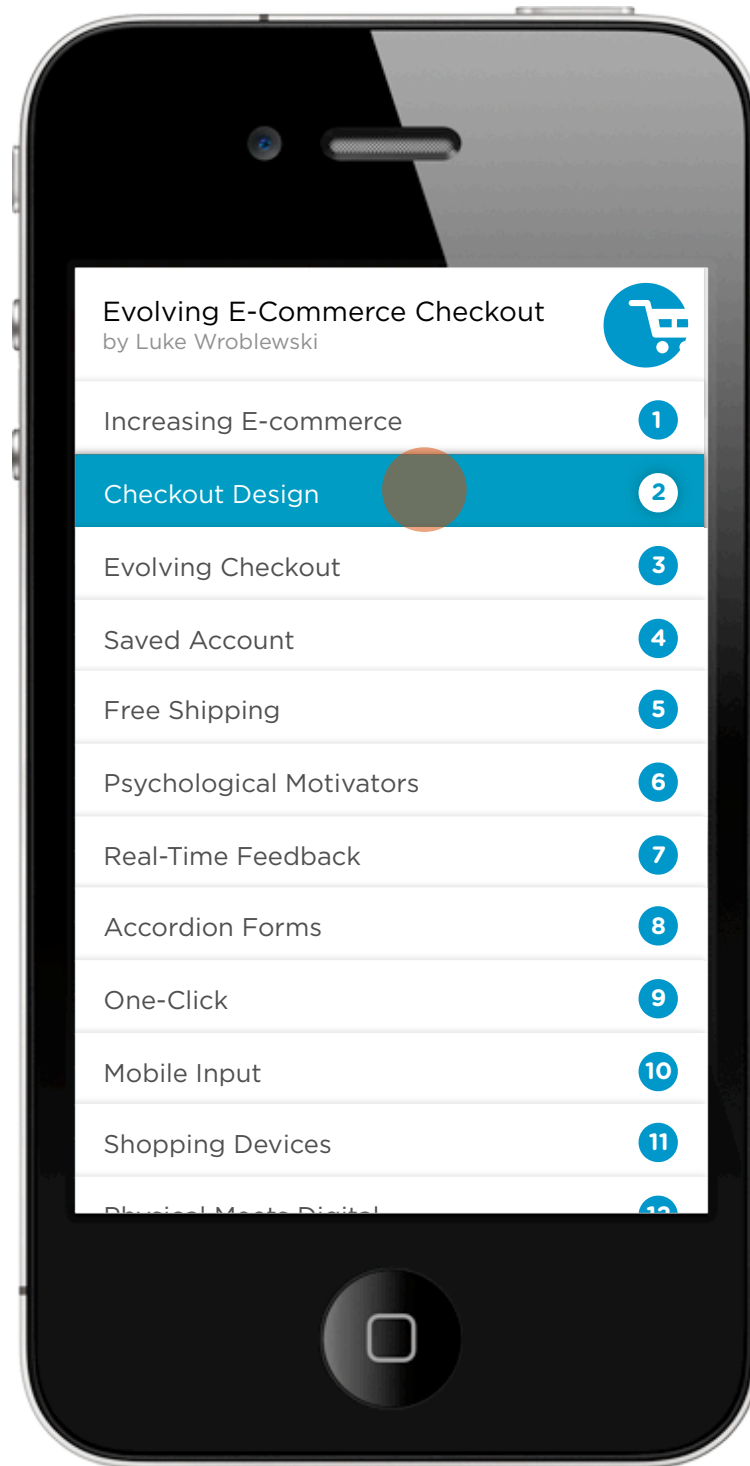
2010		2011	
10%	Q1	12%	Q1
9%	Q2	14%	Q2
9%	Q3	13%	Q3

Reading Area

# Discovering Gestures

---

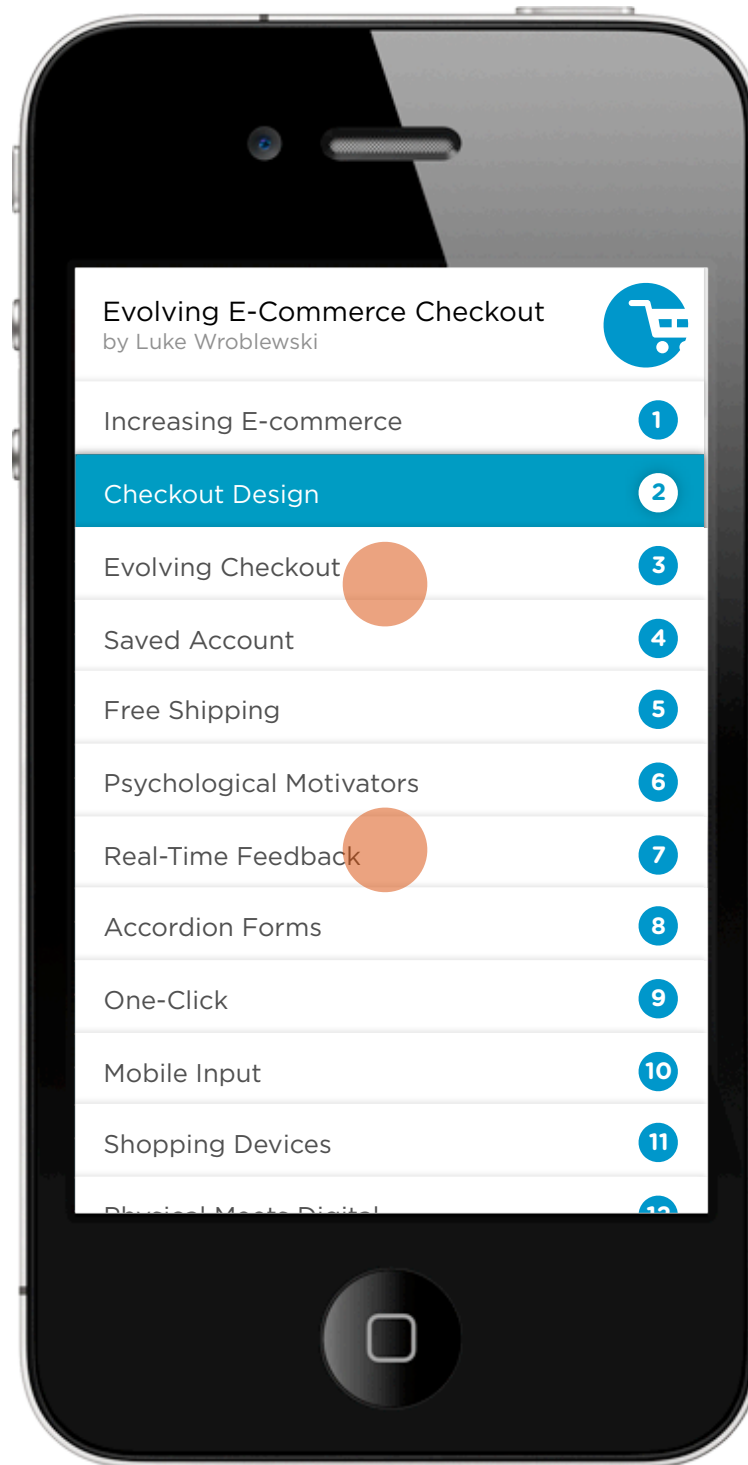
1. Just-in-time Education
2. Content Teases
3. Animation Cues
4. Removal of other Options



Tap to open card

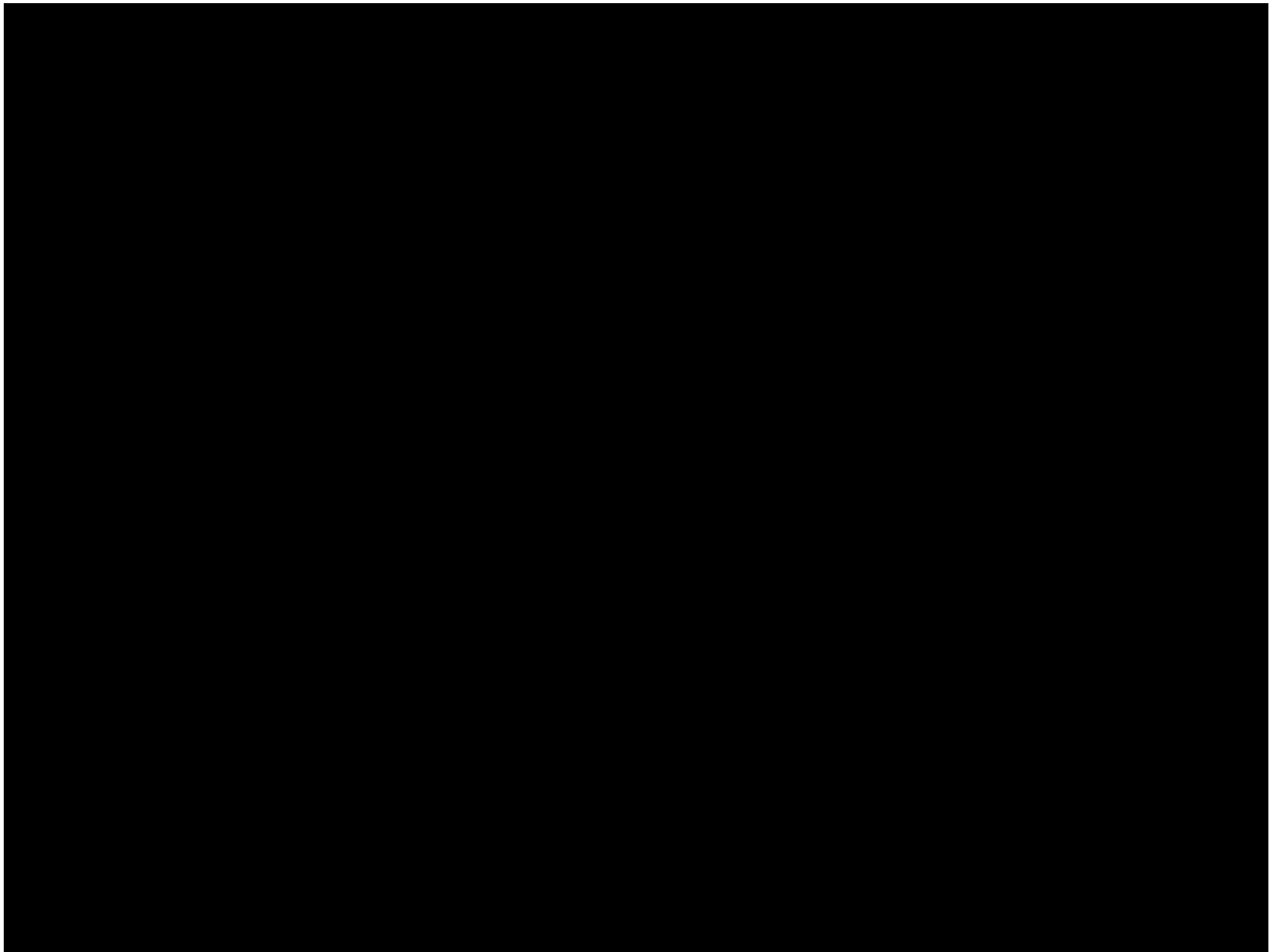


Pinch on any card

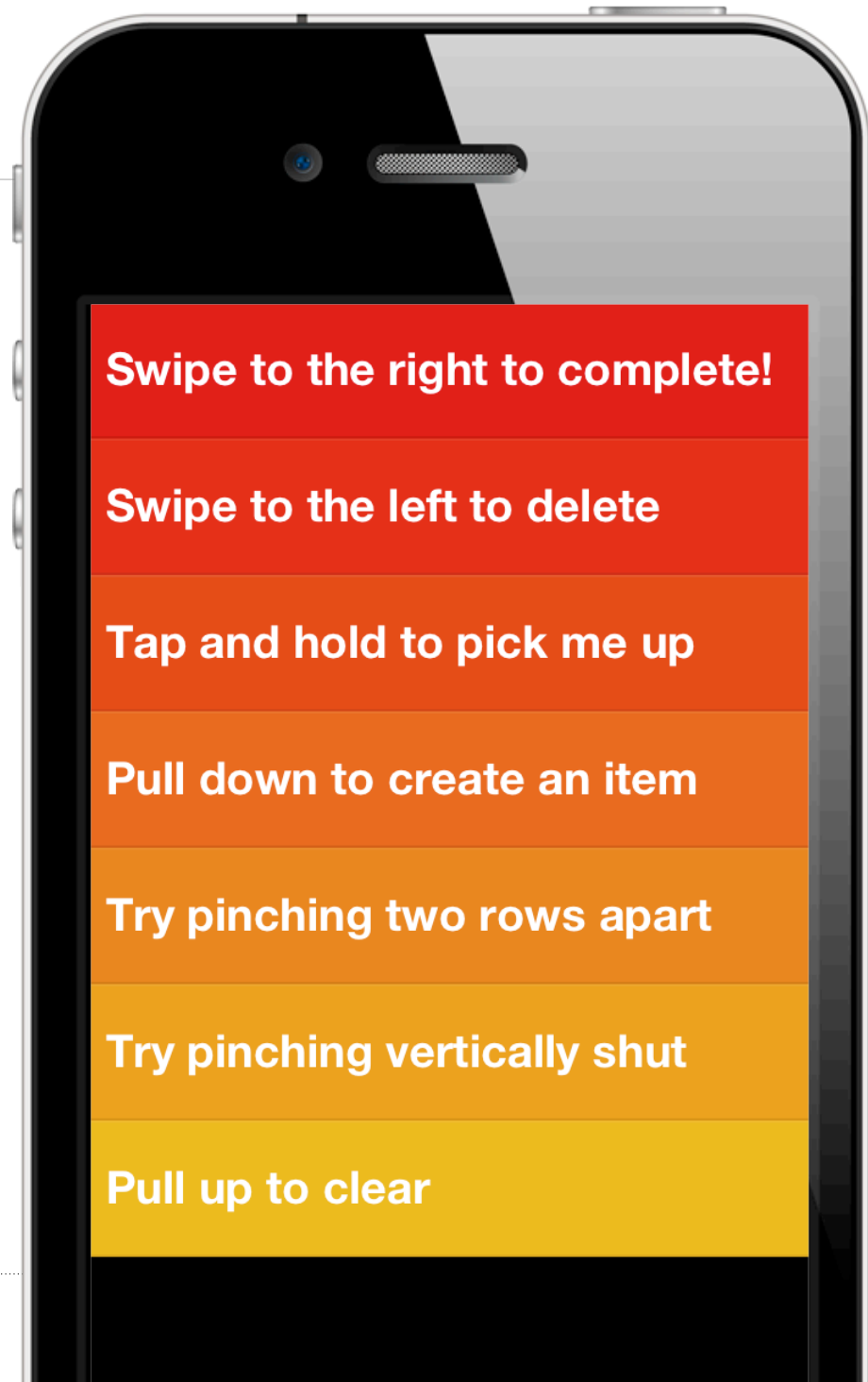


Scrollable list





# Help as Content



# Natural User Interfaces (NUI)

---

*“NUI exploits skills that we have acquired through a lifetime of living in the World” -Bill Buxton*



- Content is the UI (the action)
- Reduce the distance as much as possible between user & content
- Enable direct manipulation of objects & content
- Guessable, predictable, physical, realistic
- Reduce Visuals that are Not Content



# 9-axis motion and orientation sensing

- Angular speed

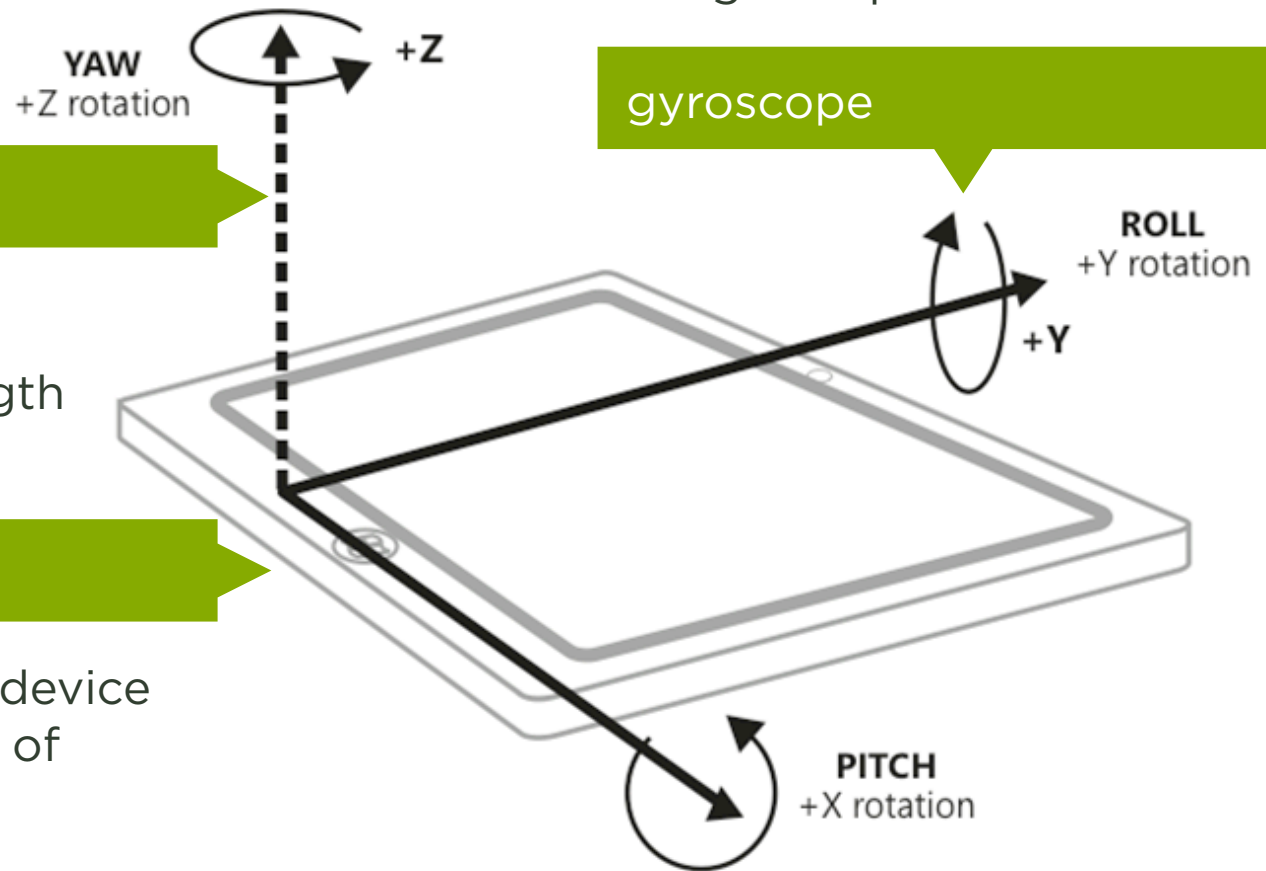
gyroscope

magnetometer

- Digital compass
- Magnetic field strength

accelerometer

- Measures motion of device (roll & pitch) & force of gravity
- Linear acceleration

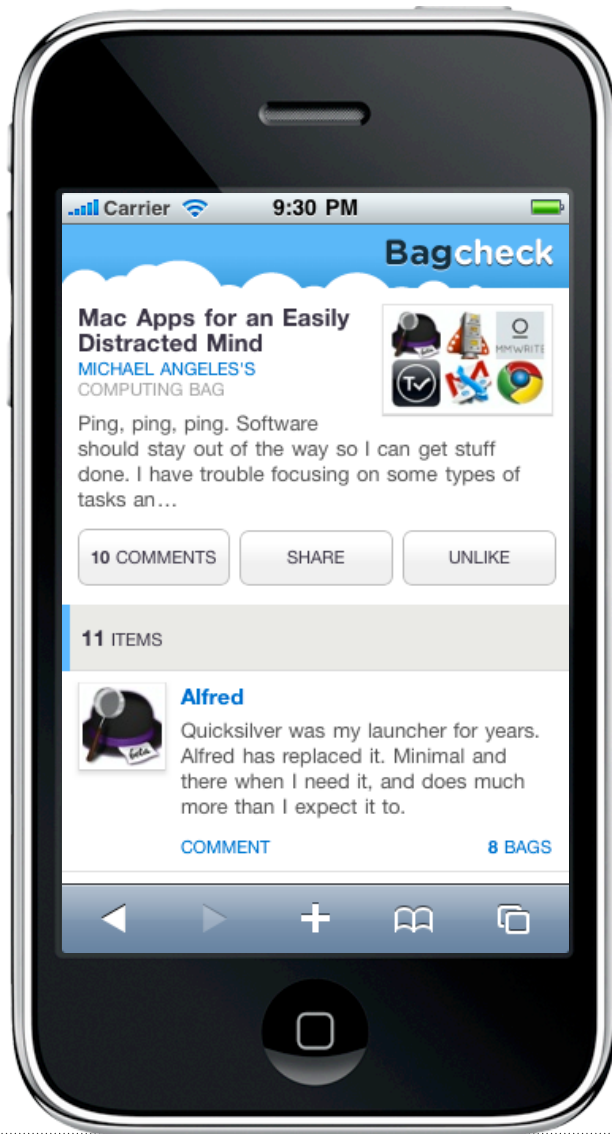


# 9-axis motion and orientation sensing

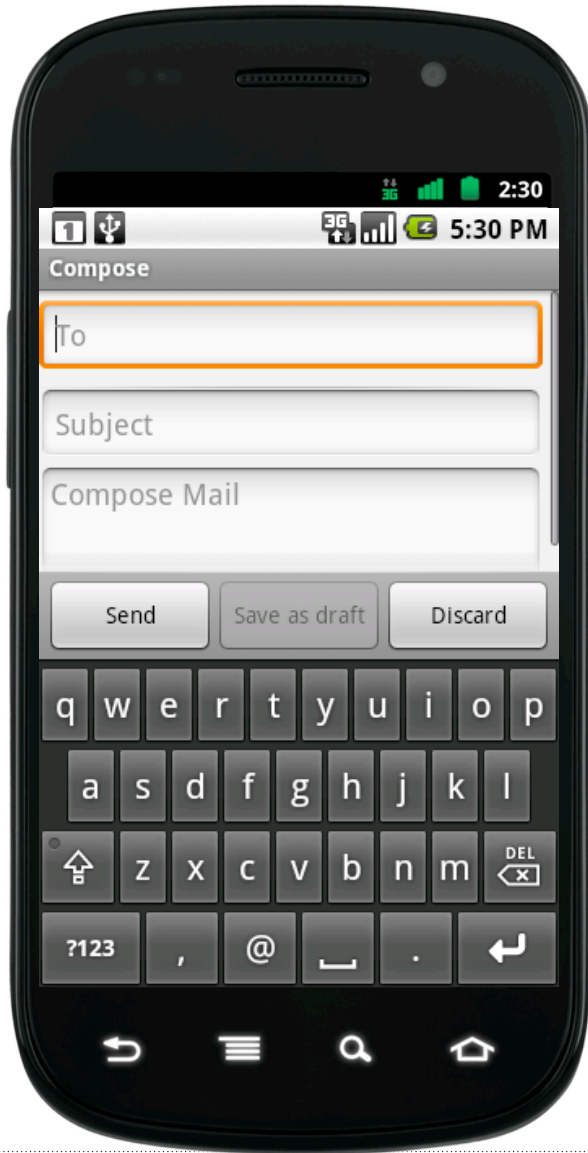
- True orientation of device in real time
- 3D motion: shakes, twists, and rotations in multiple dimensions
- Has to be tested on actual device
- <http://remote-tilt.com/>



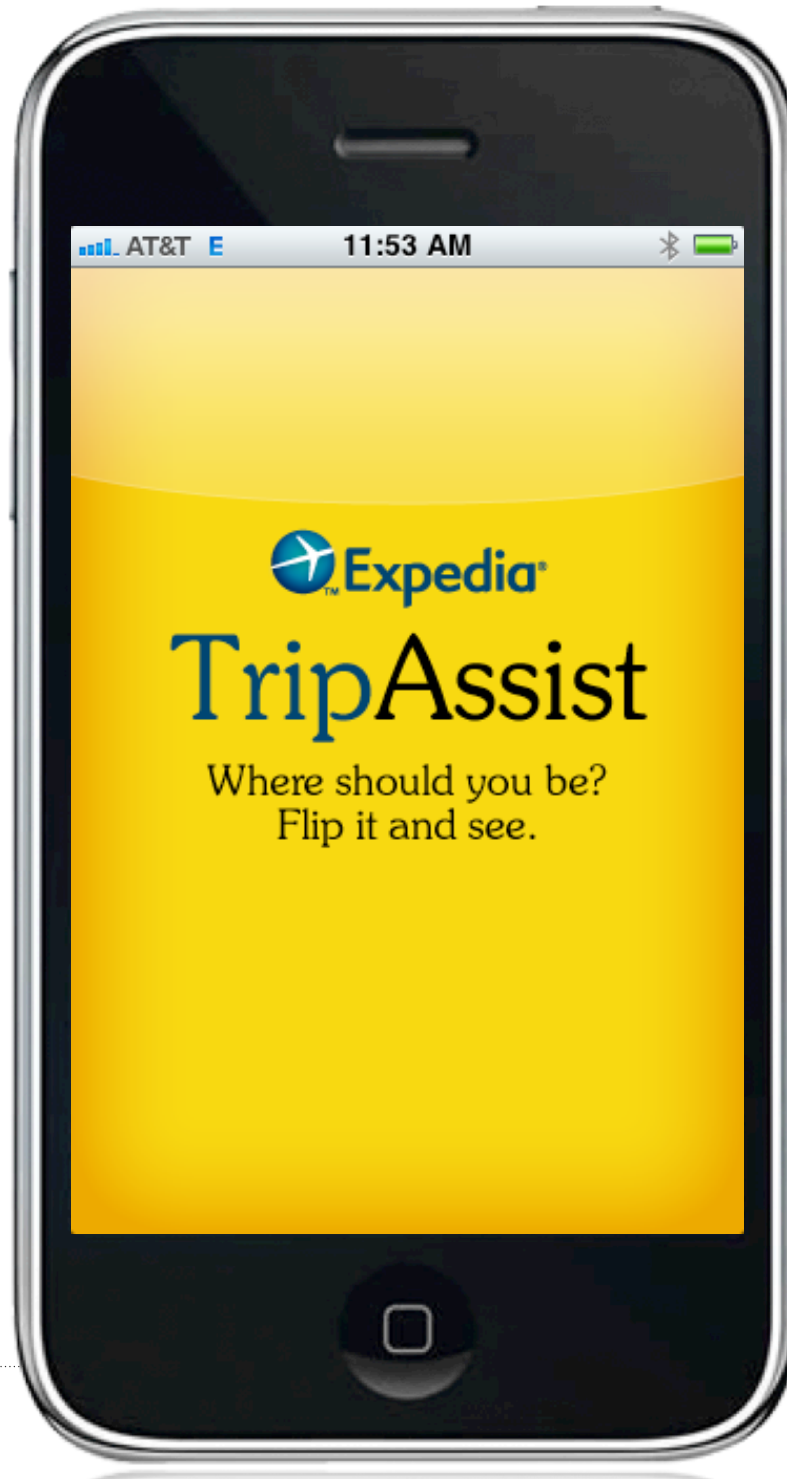
# Landscape Mode



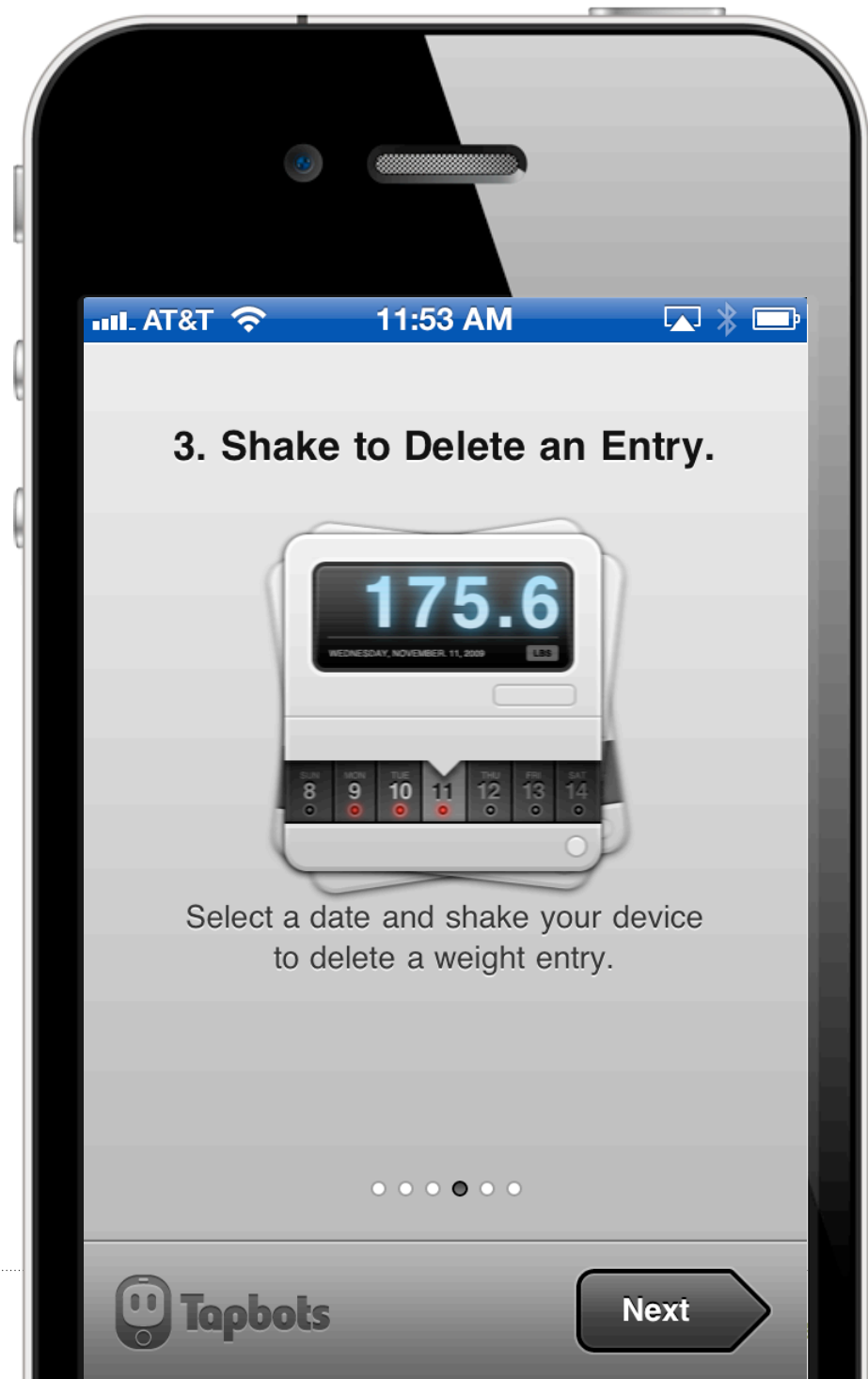
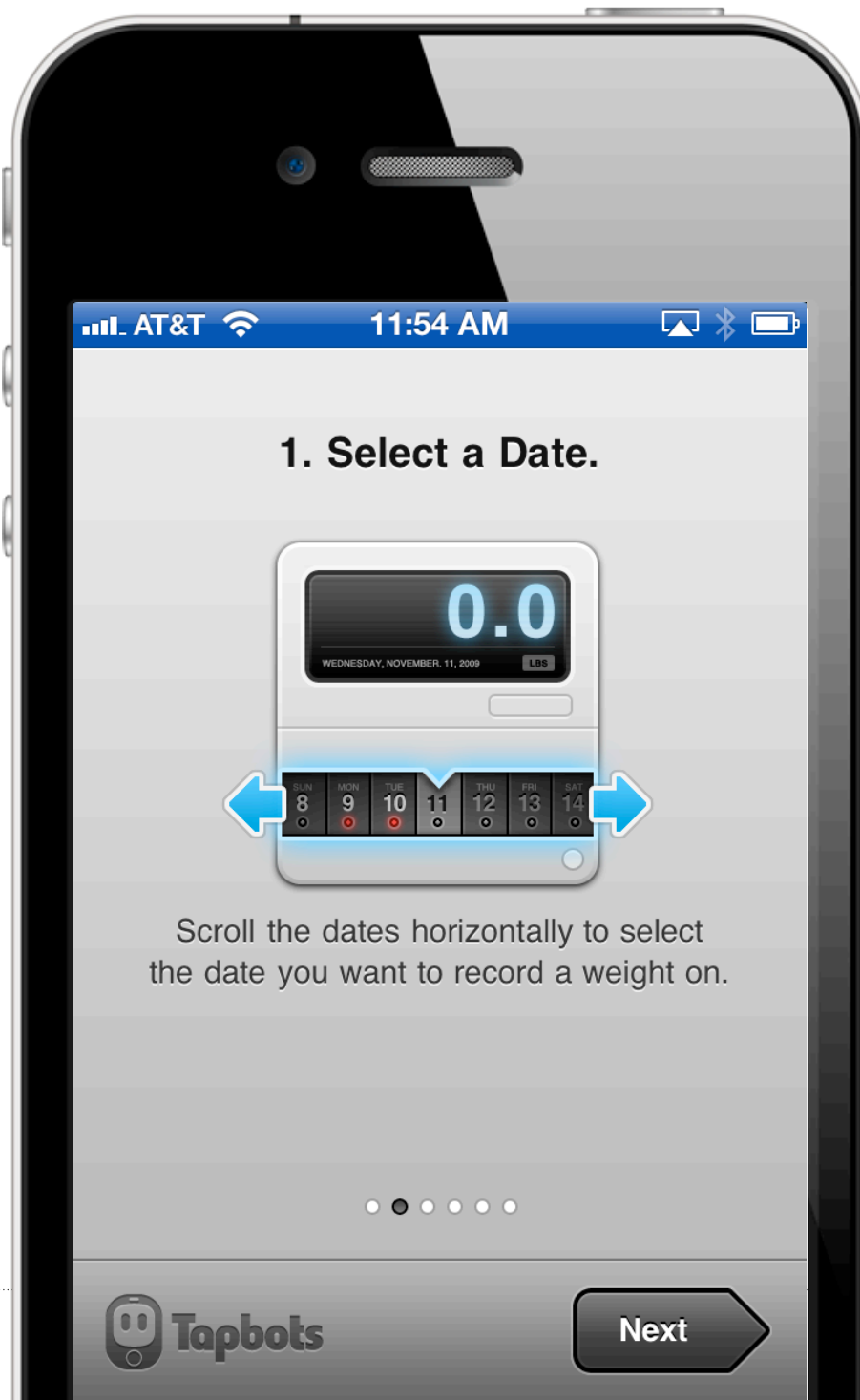
# Landscape Mode





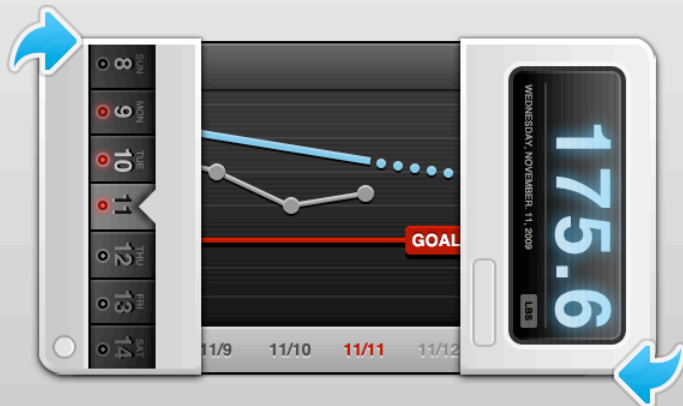






AT&T 11:54 AM

#### 4. Rotate Clockwise to View the Graph.



Double-tap the graphs to access various views.



Next

AT&T 11:54 AM

#### 5. Rotate Counter-Clockwise to View Progress.



Track your progress and view statistical data.



Finish

# **Tilt Scrolling in Instapaper Pro**

**[instapaper.com/iphone](http://instapaper.com/iphone)**

# Bump

- To match between two devices...
- Accelerometer data
- Location of the handset
- IP address assigned
- Lots of other stuff

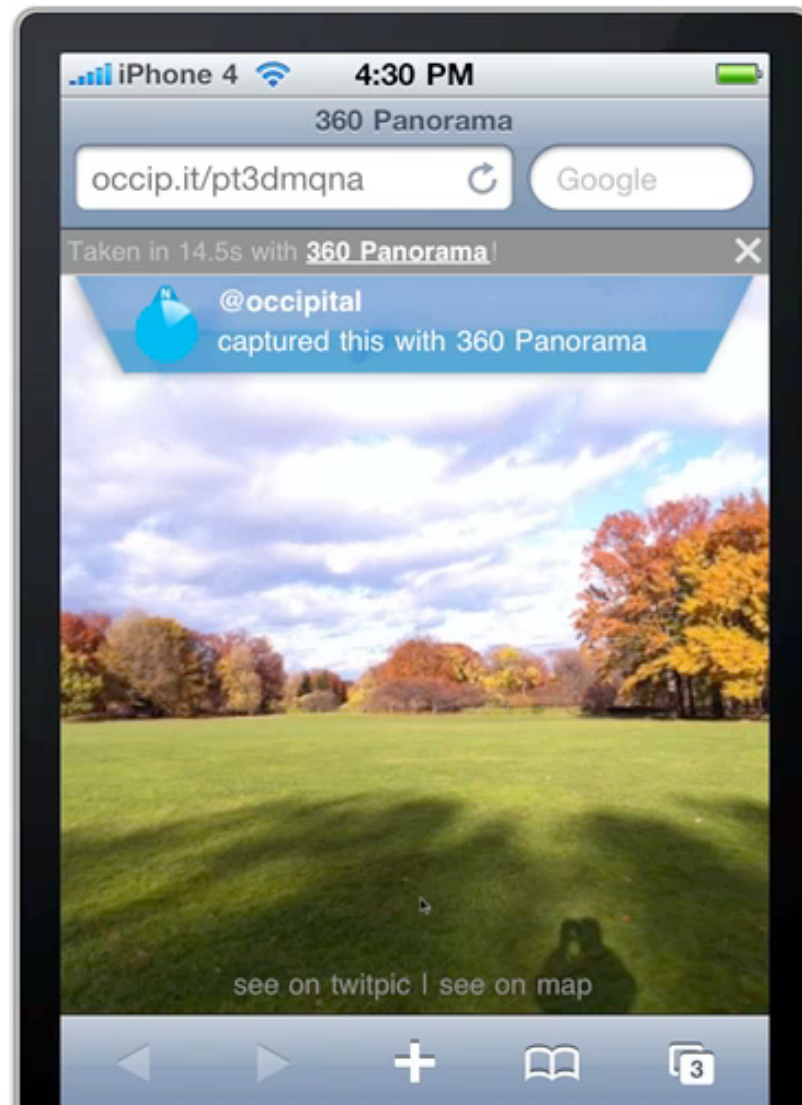


# Safari Accelerometer Access

iPhone 4 accelerometer experiment  
<http://pus.hu/g6pKPI>



# Safari Gyroscope Access





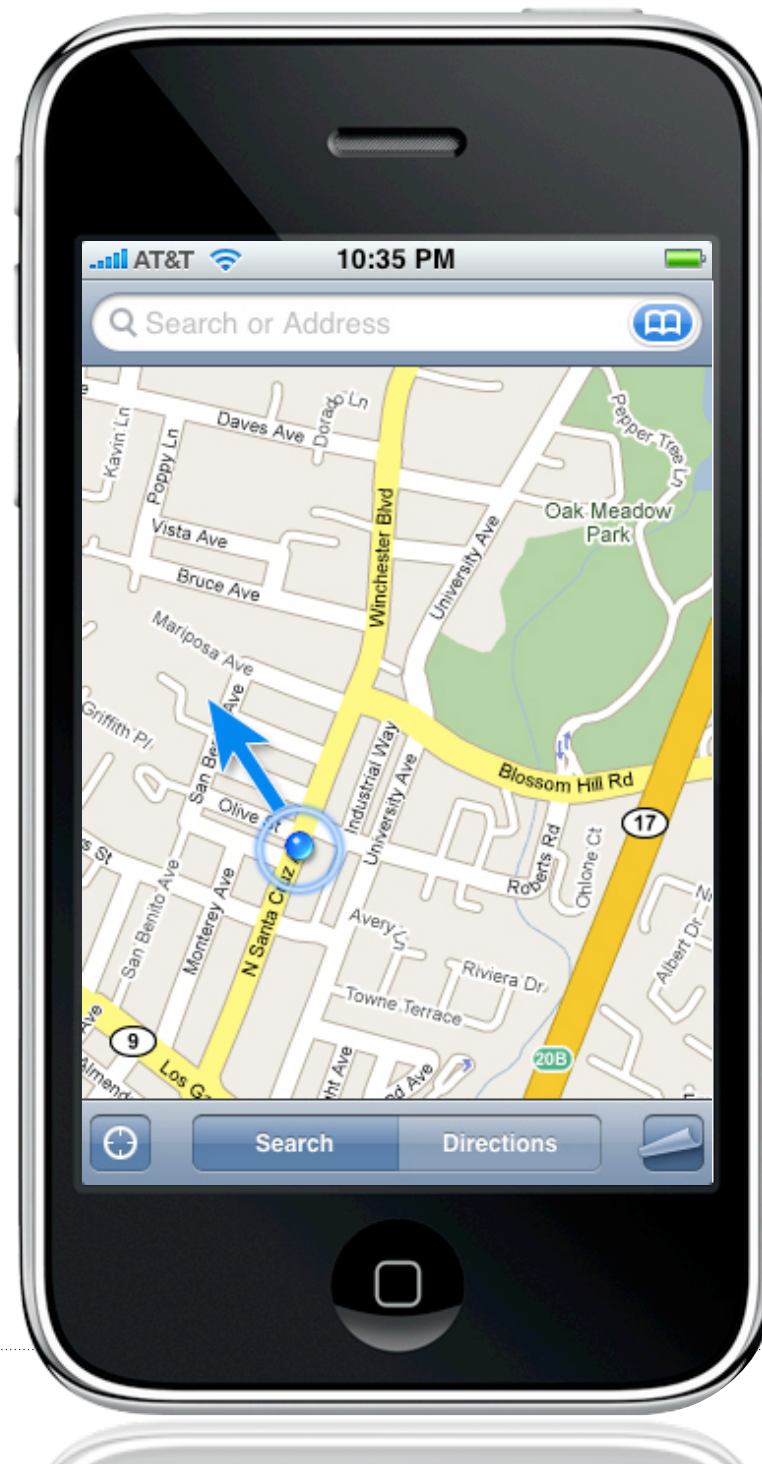
# iOS5 Digital Compass Access

---



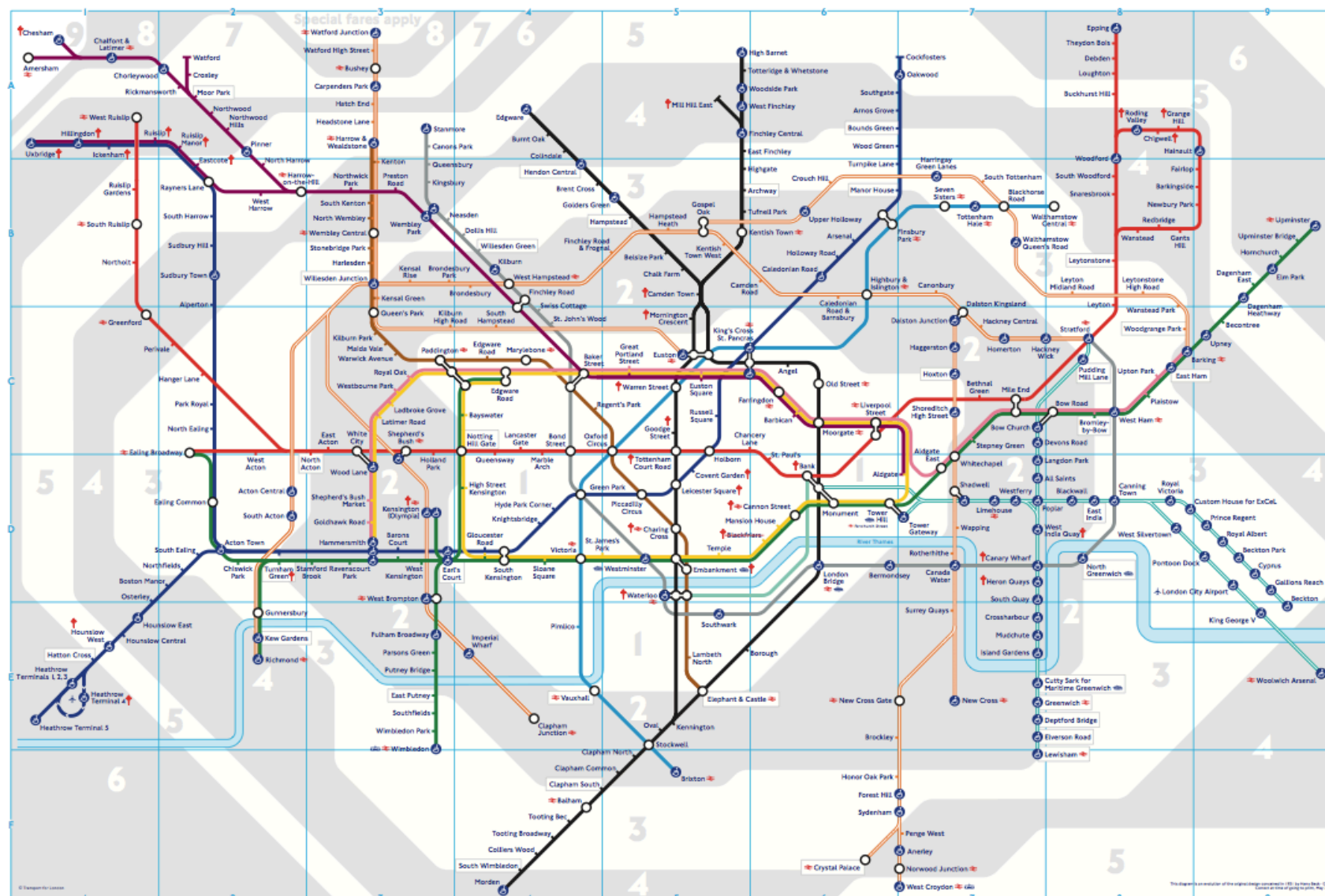
Source: <http://bit.ly/rqfcdw>

Direction  
Detection



Location  
Detection

# Tube map



## Key to lines + Check before you travel

<b>Bakerloo</b>	No special arrangements
<b>Central</b>	Chigwell, Grange Hill, Roding Valley Served until about 2400
<b>Circle</b>	Blackfriars Underground station closed until late 2011
	Cannon Street Open until 2100 Mondays to Fridays. Closed Saturdays and Sundays
<b>District</b>	Blackfriars Underground station closed until late 2011
	Cannon Street Open until 2100 Mondays to Fridays. Closed Saturdays and Sundays
	Kensington (Olympic) Served 0700 until 2345 Mondays to Saturdays and 0800 until 2345 Sundays
<b>Hammersmith &amp; City</b>	No special arrangements
<b>Jubilee</b>	Canary Wharf Step-free interchange between Underground, Canary Wharf DLR and Heron Quays DLR stations at street level
<b>Metropolitan</b>	Chesham Change at Chalfont & Latimer on most trains
<b>Northern</b>	Camden Town Open for interchange and exit only from 1300 until 1730 Saturdays and Sundays
	Charing Cross branch Change at Kennington at off-peak times If travelling towards or from Morden
	Mil Hill East Change at Finchley Central at off-peak times
<b>Piccadilly</b>	Covent Garden A short walk from either Leicester Square (6 minutes) or Holborn (9 minutes)
	Eastcote to Uxbridge Not served by Piccadilly line trains early morning
	Heathrow Terminal 4 Open until 2400 Mondays to Saturdays and until 2330 Sundays. Trains may wait for eight minutes before continuing to Terminal 1,2,3
	Hounslow West Step-free access for wheelchair users only
	Turnham Green Served by Piccadilly line trains early mornings and late evenings only
<b>Victoria</b>	No special arrangements
<b>Waterloo &amp; City</b>	Bank to Waterloo Open 0615 until 2148 Mondays to Fridays and 0800 until 1830 Saturdays. Closed Sundays and public holidays
<b>Overground</b>	No special arrangements
<b>DLR</b>	Heron Quays Step-free interchange between Heron Quays and Canary Wharf Underground station at street level
	West India Quay Not served by DLR trains from Bank towards Lewisham at peak times

MAYOR OF LONDON

Website  
tfl.gov.uk

24 hour travel information  
020 7222 1234

Transport for London



All Visitor and







acrossair

King's Cross  
2.90 km / 1.80 miles

Nearest for

Victoria

Also on

Circle

Hammersmith  
& City

Metropolitan

Piccadilly

Northern

Harringay Green  
7.58 km / 4.71 miles

Nearest for

Overground

Bank

0.36 km / 0.22 miles

Nearest for

Northern

Waterloo & City

DLR

St. Paul's  
1.12 miles

Also on

Central

Barbican  
0.61 km / 0.37 miles

Nearest for

Metropolitan

Hammersmith  
& City

Also on

Circle

St. Paul's  
0.32 km / 0.18 miles

Nearest for

Central

Mansion House  
0.28 km / 0.17 miles

Nearest for

Circle

District





When discovered by users  
boosted their sustained traffic  
by 40 to 50 percent.

“It was sort of beyond our  
expectations. We had no idea.”

Yelp CEO,  
Jeremy Stoppelman

# Native App

---



- Location detection
- Device orientation
- Digital compass
- Video camera access

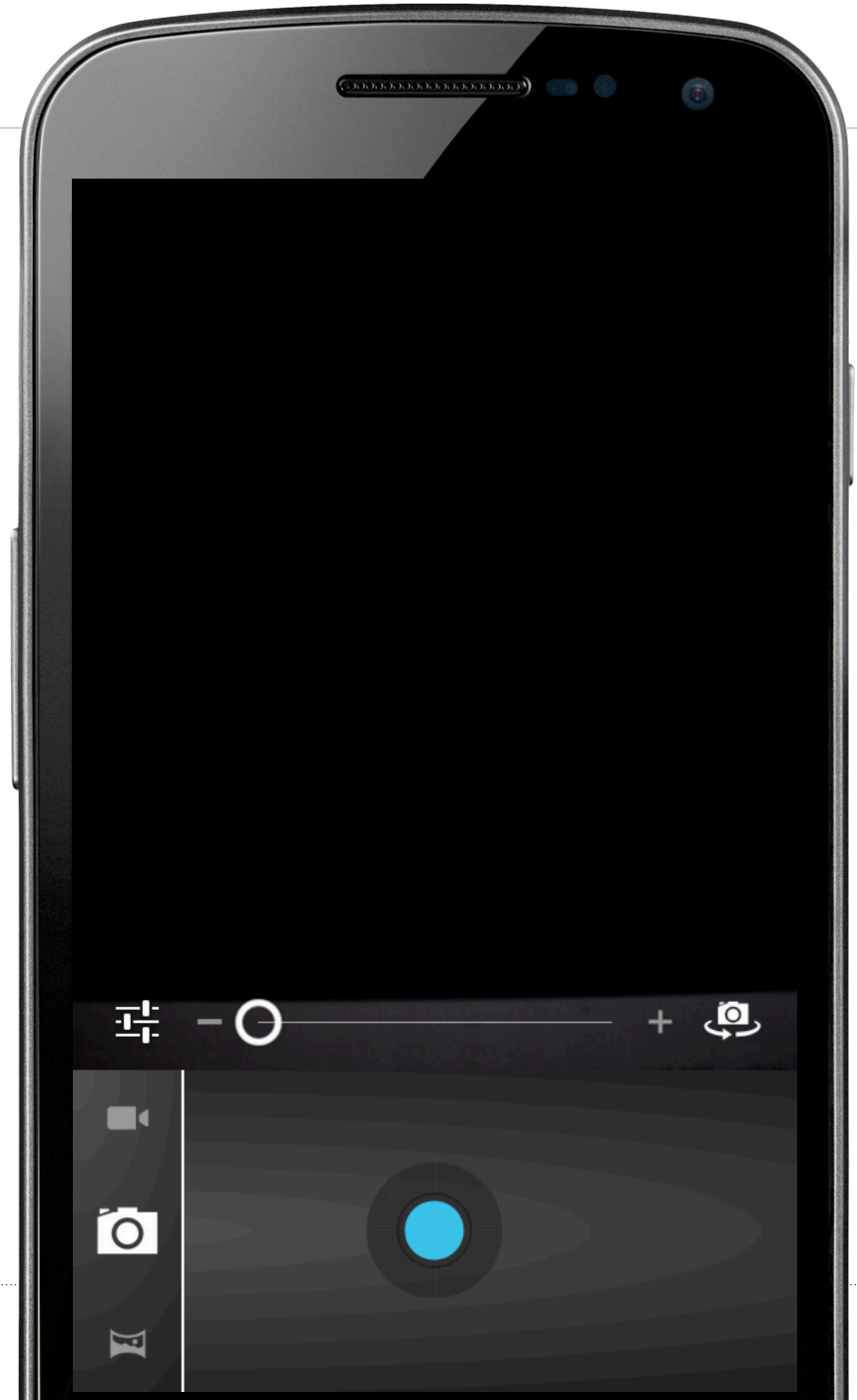
# Mobile Web



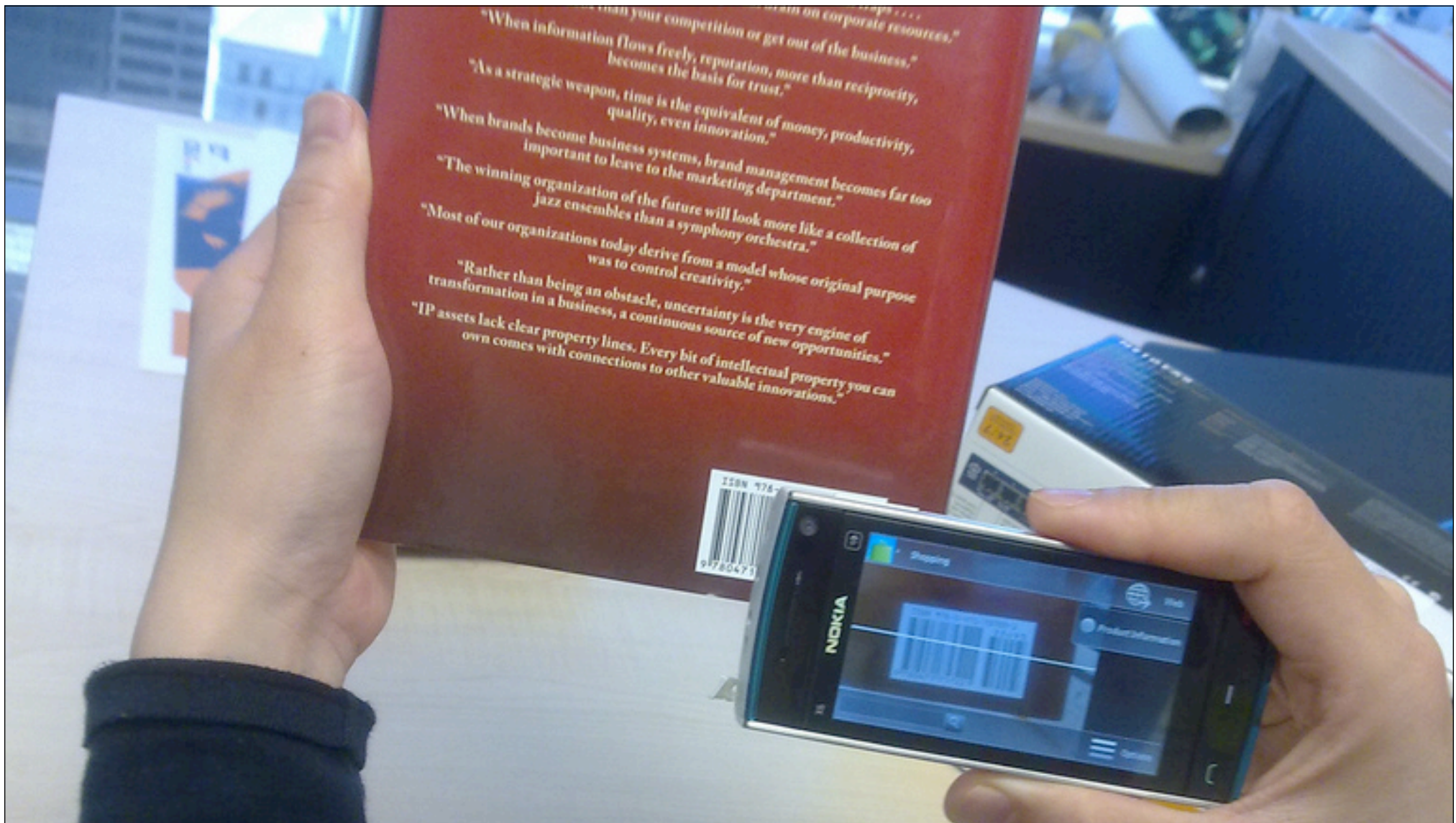
- Location detection
- Device orientation
- Digital compass (iOS 5)

# Camera Input

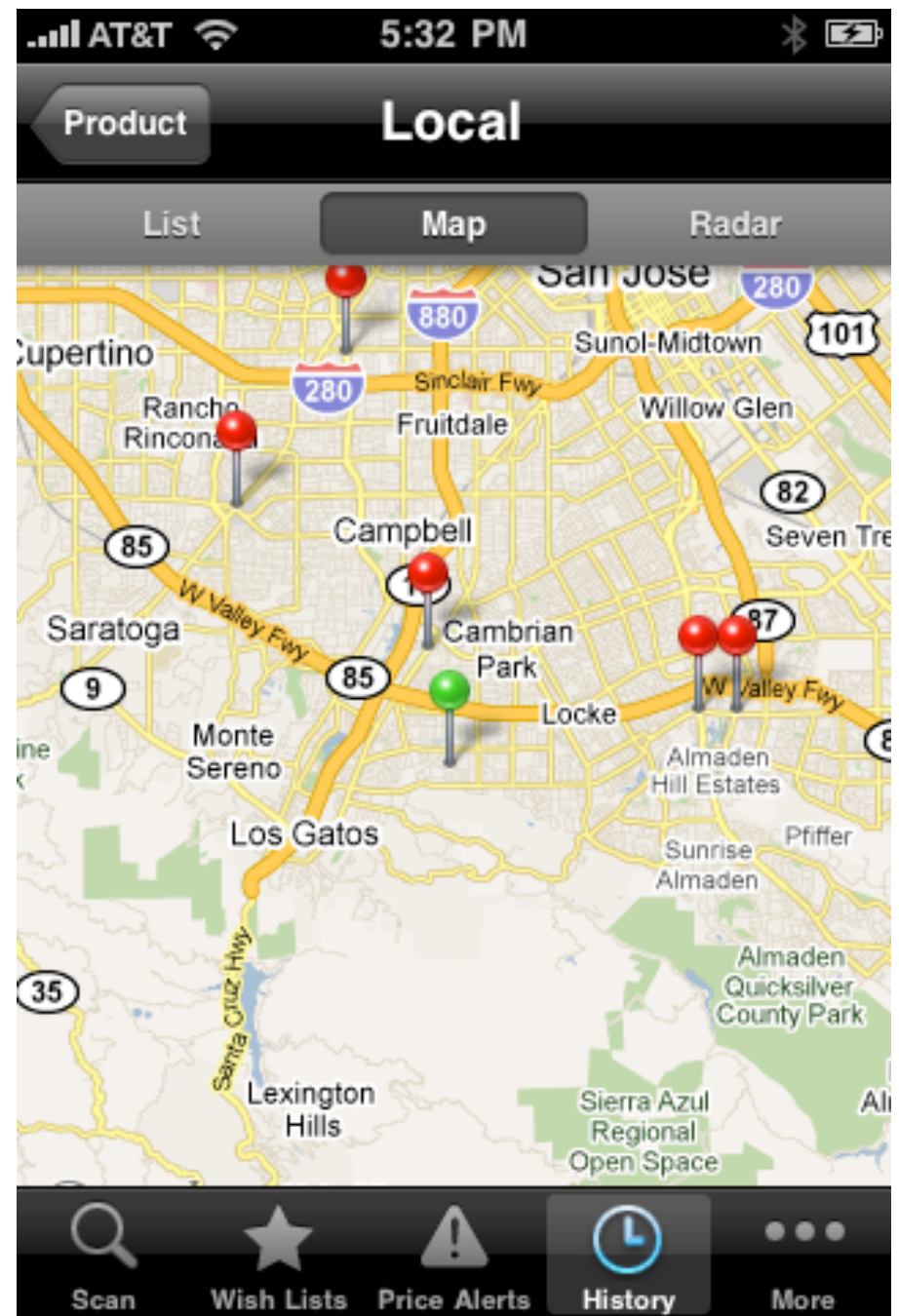
- Use pre-existing file or live capture
- Stock UI for both
- Can be customized with overlays, controls, content
- Can process live stream or saved file





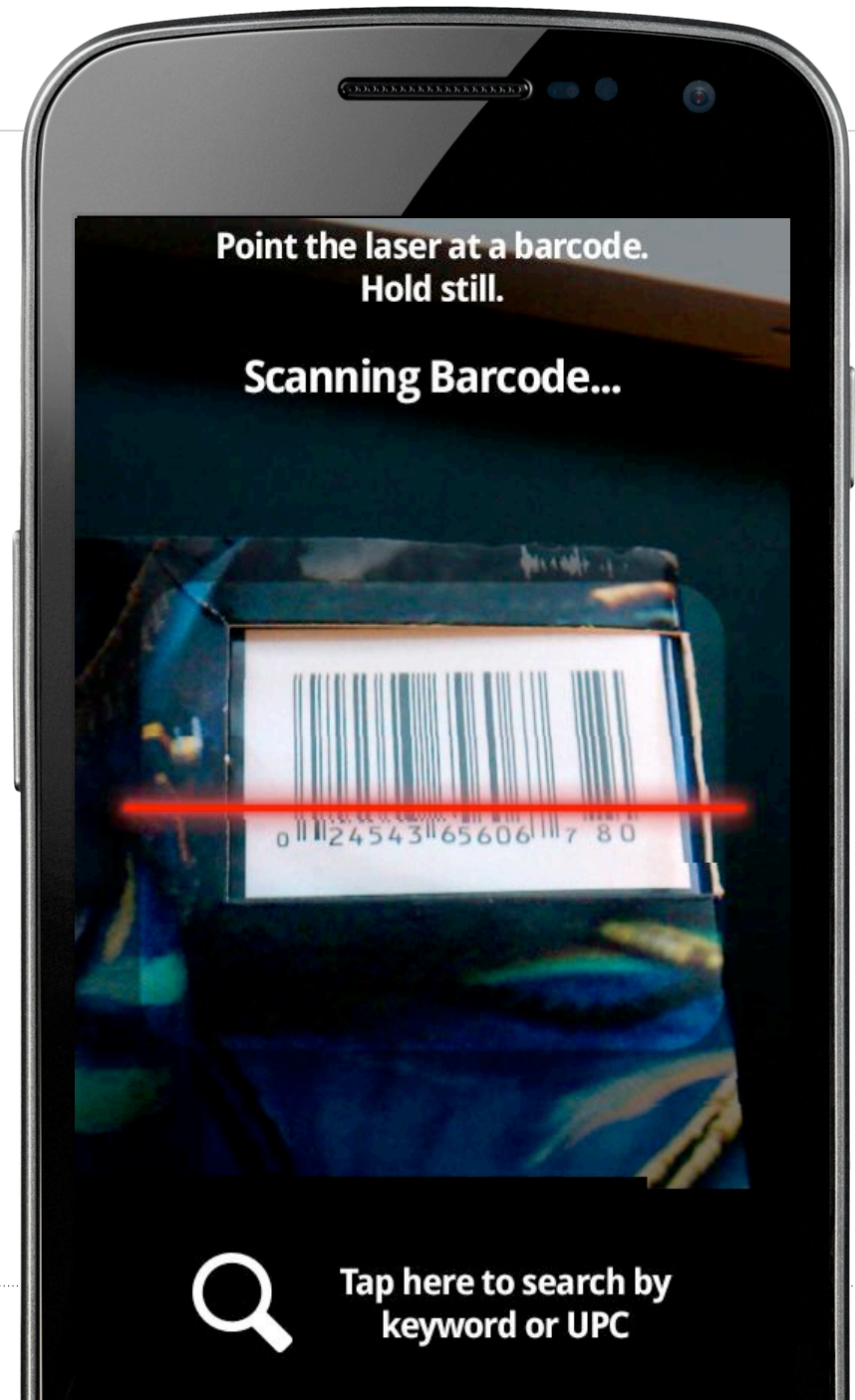


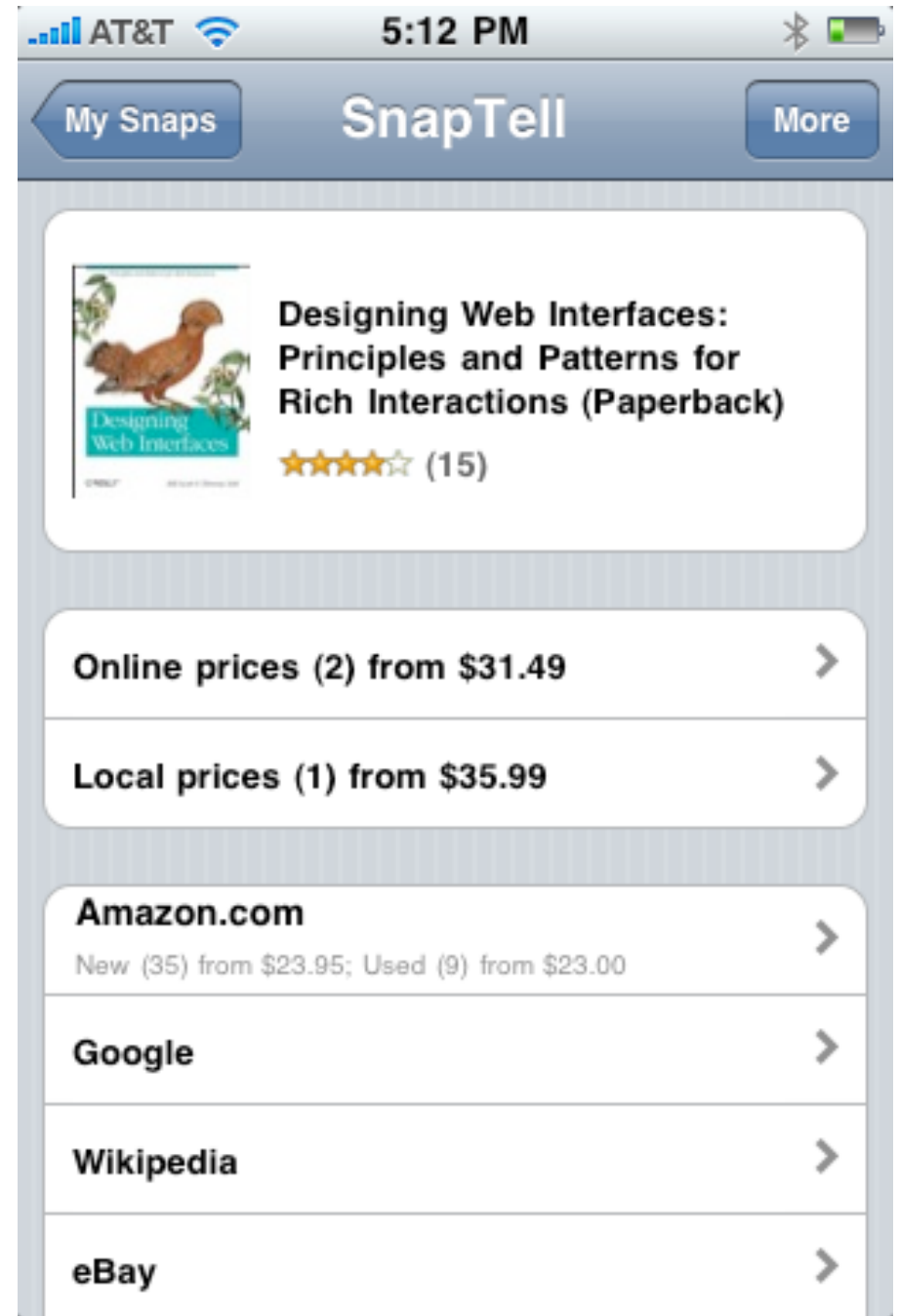
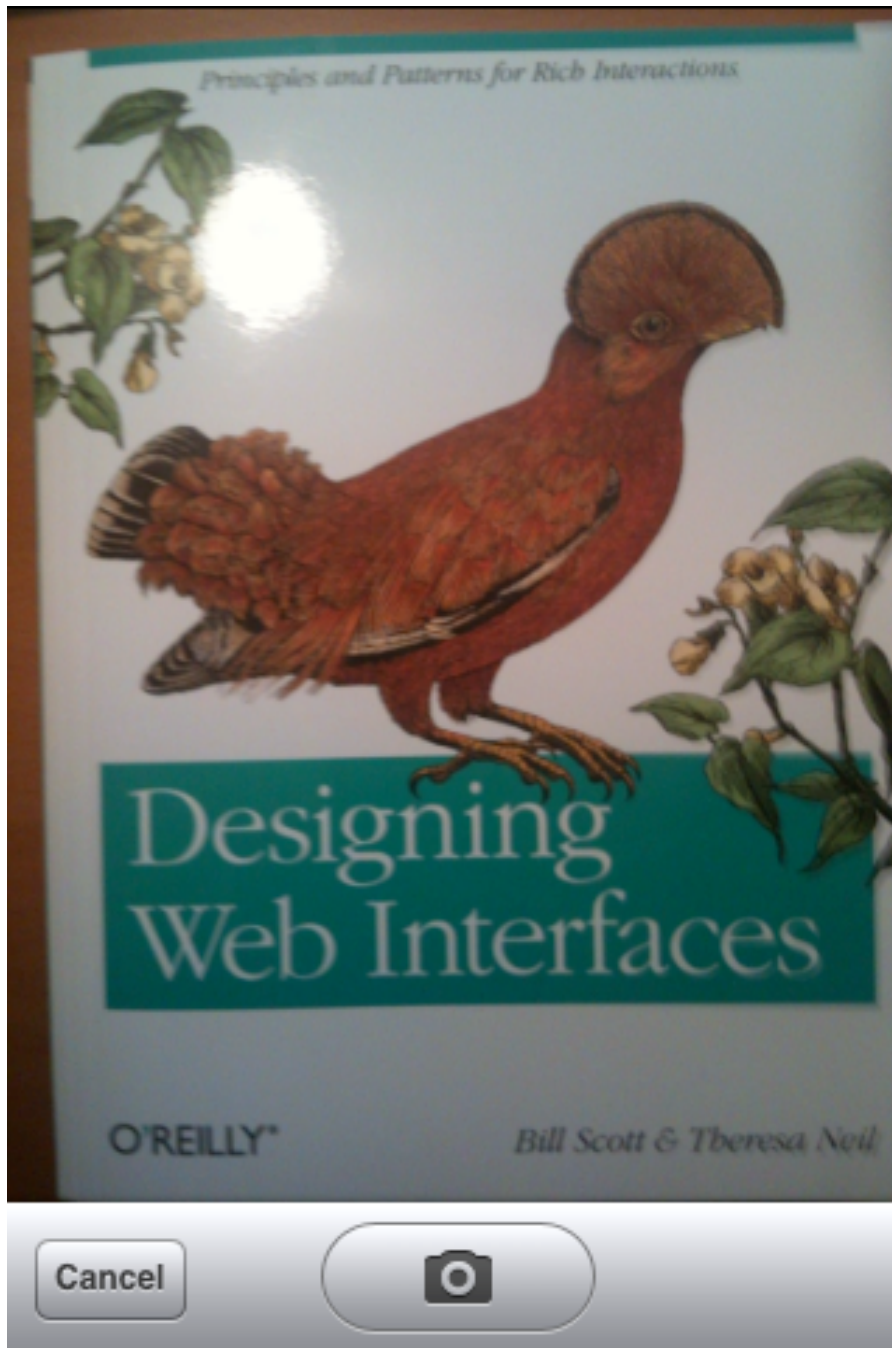
# SCAN TO CHECKOUT



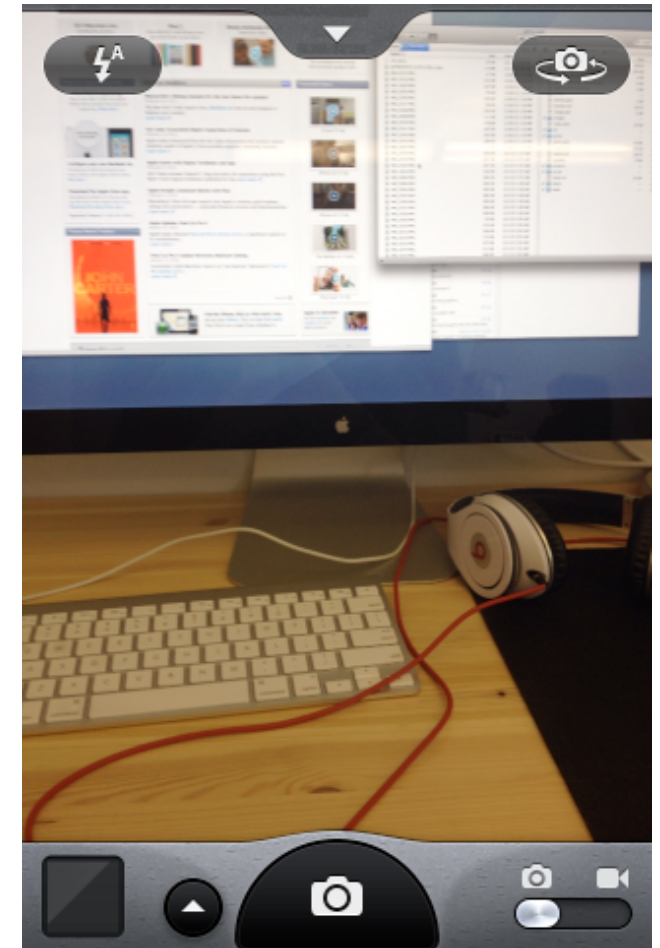
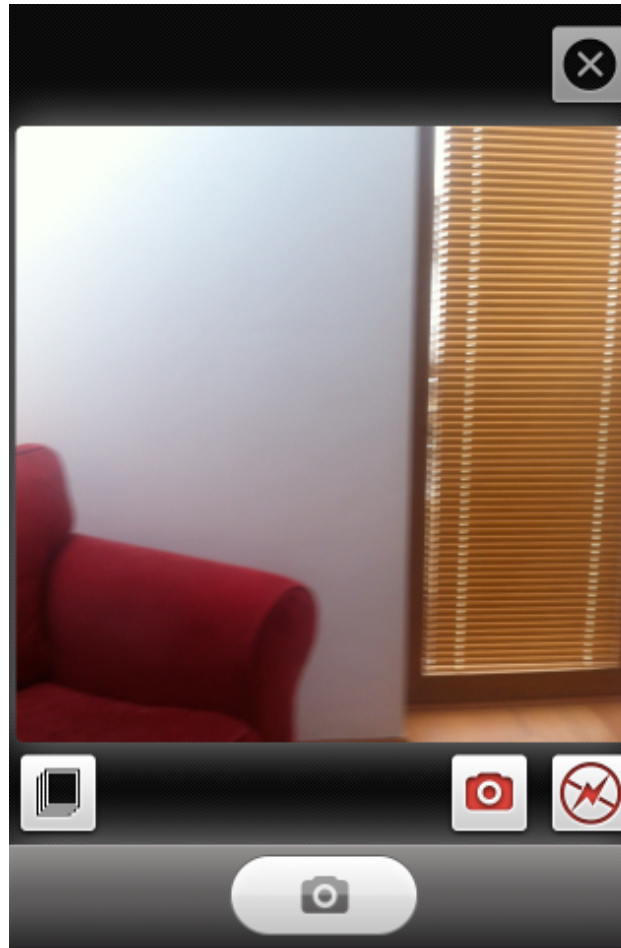
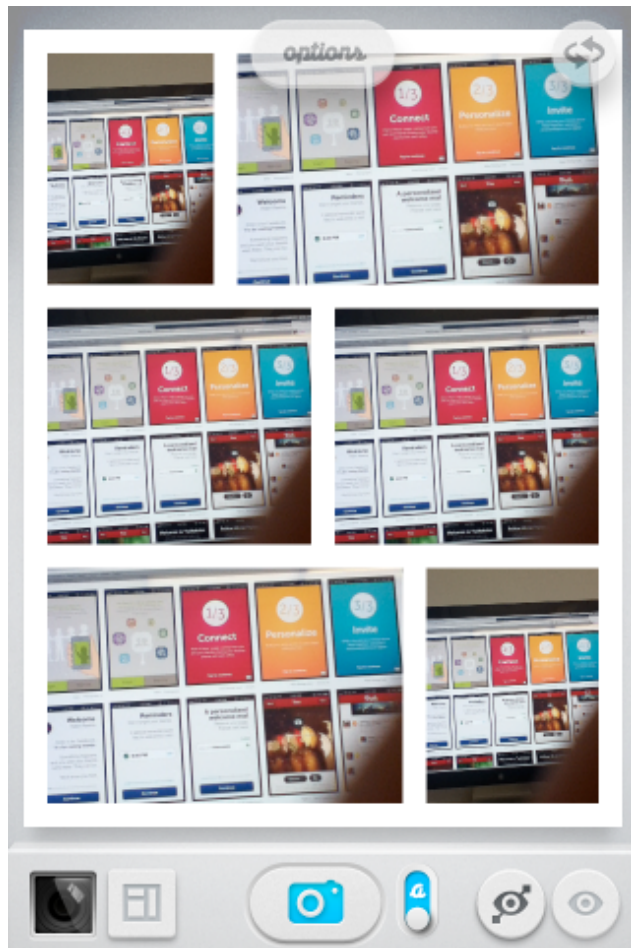


# Video Overlays

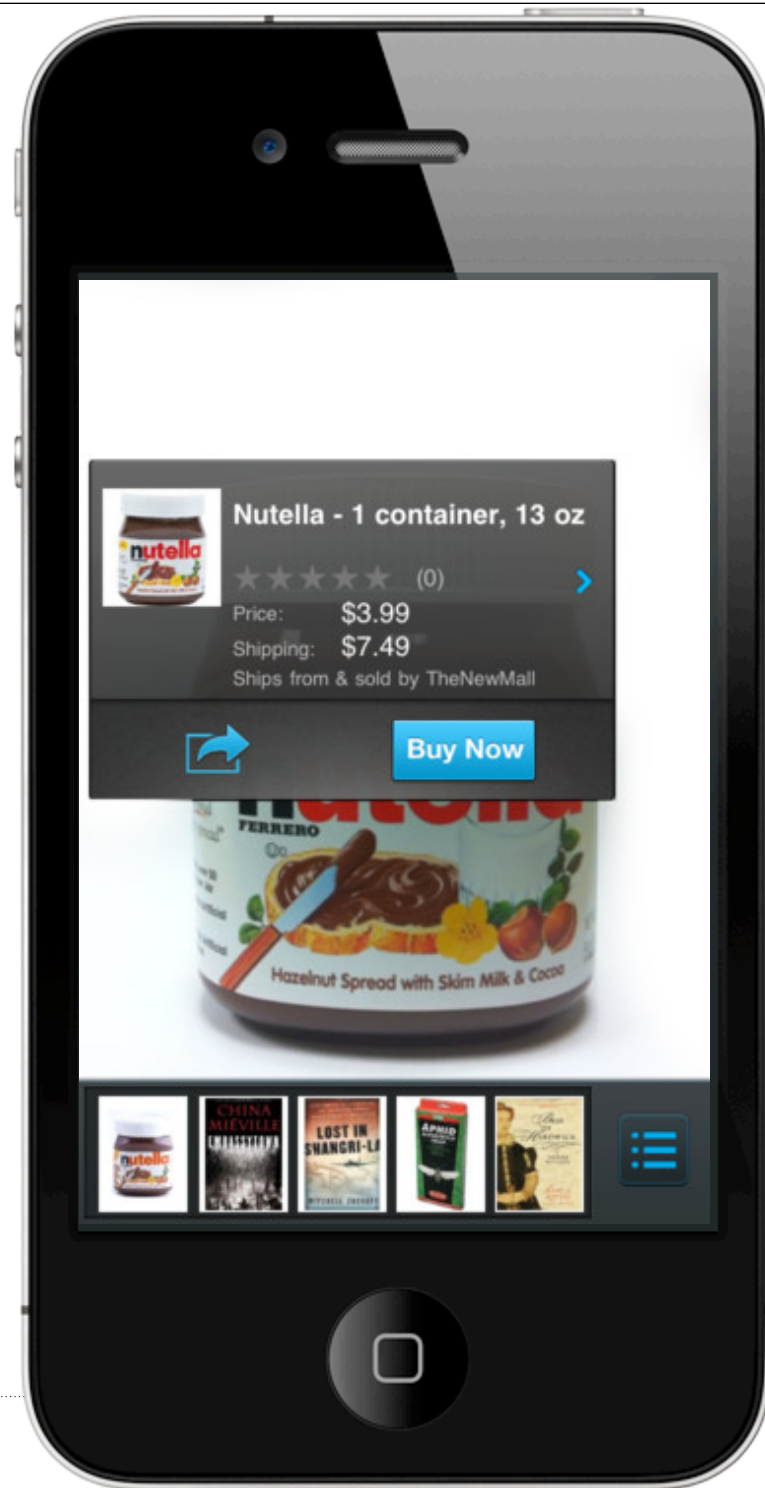




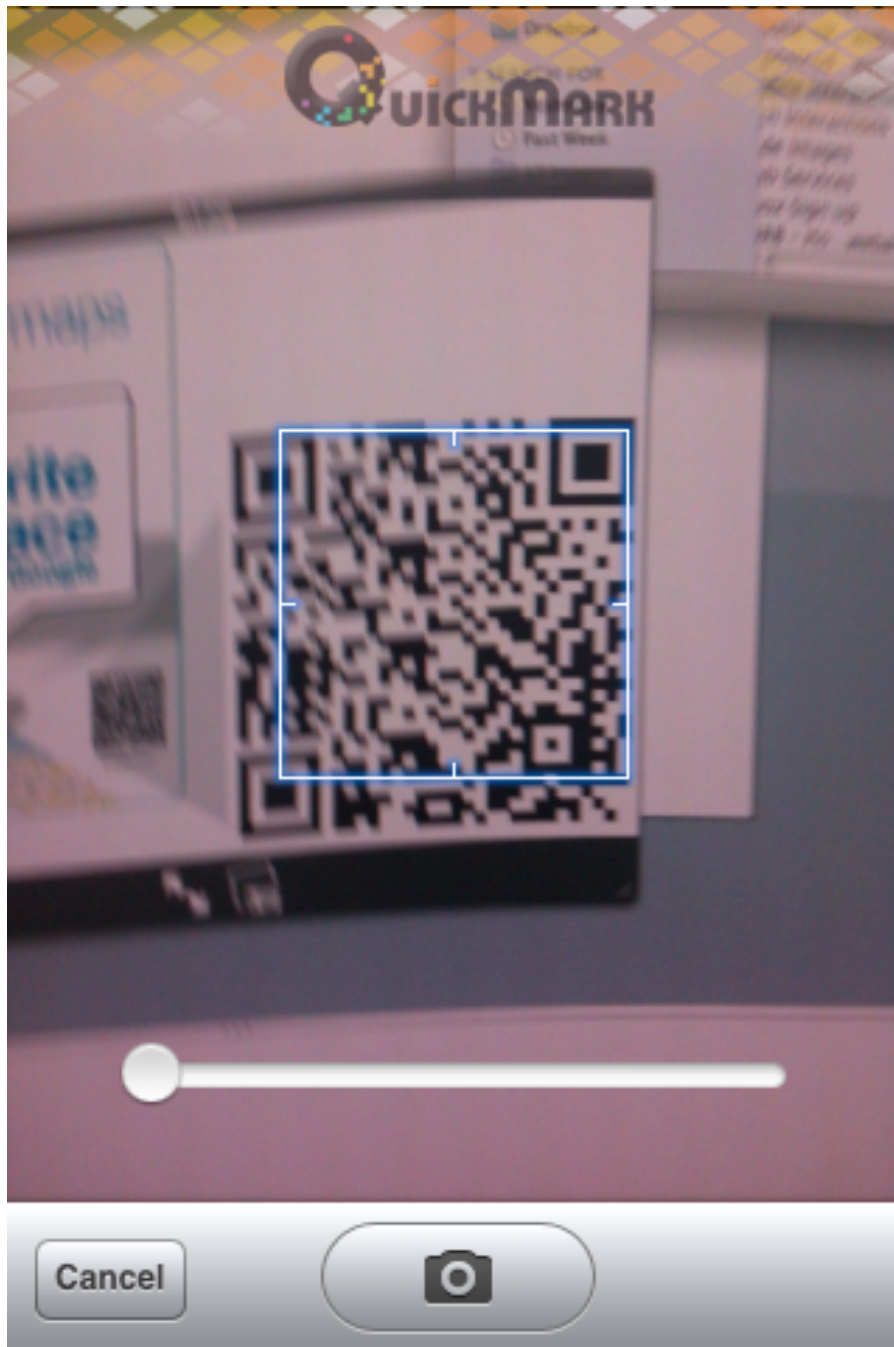
# Camera Customizations











AT&T 5:10 PM

Google Web Images Local more

☆

## Kasa Indian Restaurant - Indian Food Delivery

4001 18th Street  
San Francisco, CA 94114

[www.kasaindian.com](http://www.kasaindian.com) - [web site](#)

★★★★☆ [14 reviews](#)



"Kasa was a nice take on Indian 'fast food'." ...  
 "San Francisco likes Indian food." ... "The portions were very generous and tasted really good." ...  
 "And besides, who needs ambiance with an idea this good?" ... "I'm a little obsessed with Kasa...it's that good!" ... "I am hooked!"  
[insiderpages.com](#), [citysearch.com](#)

(415) 621-6940 Map »

### Details

**Hours Of Operation:** Monday: 11:00AM - 10:00PM, Tuesday: 11:00AM - 10:00PM, Wednesday: 11:00AM - 10:00PM, Thursday: 11:00AM - 10:00PM, Friday: 11:00AM - 10:00PM, Saturday: 11:00AM - 10:00PM, Sunday: 11:00AM - 10:00PM

Navigation icons: back, forward, home, search, and a tab indicator showing 6 tabs.



# Deposit a Check

CHASE 

 PNC

charles SCHWAB

  
USAA

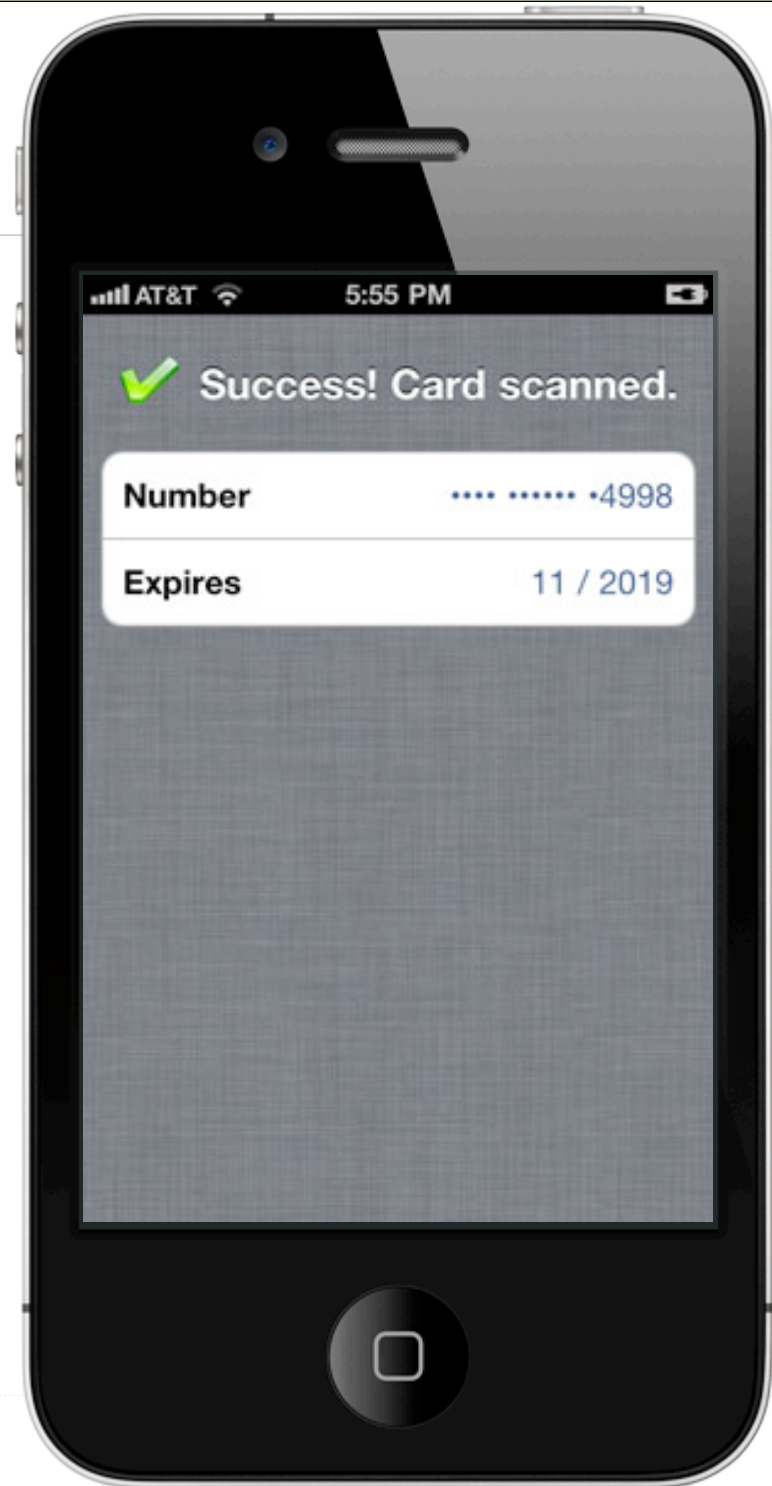


Bank<sup>®</sup>

LUKEW  
IDEATION + DESIGN



# Get Paid



# Process Receipts



The sweetest way to manage  
all of your purchases



Easily scan or  
email your  
receipts



We'll digitize  
and enrich  
them



You'll get reports, useful  
information & storage for  
your receipts!



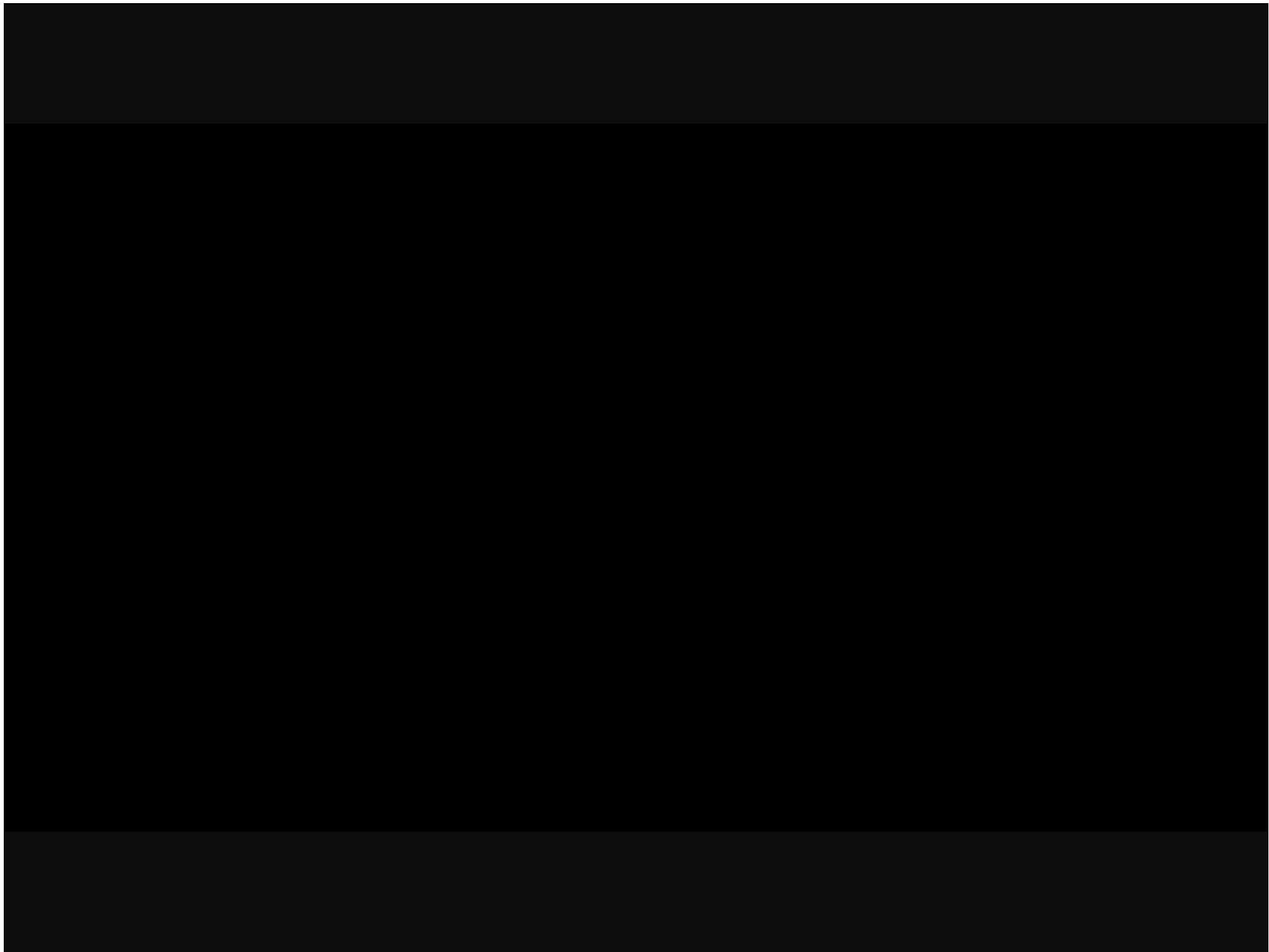
# Images as Input





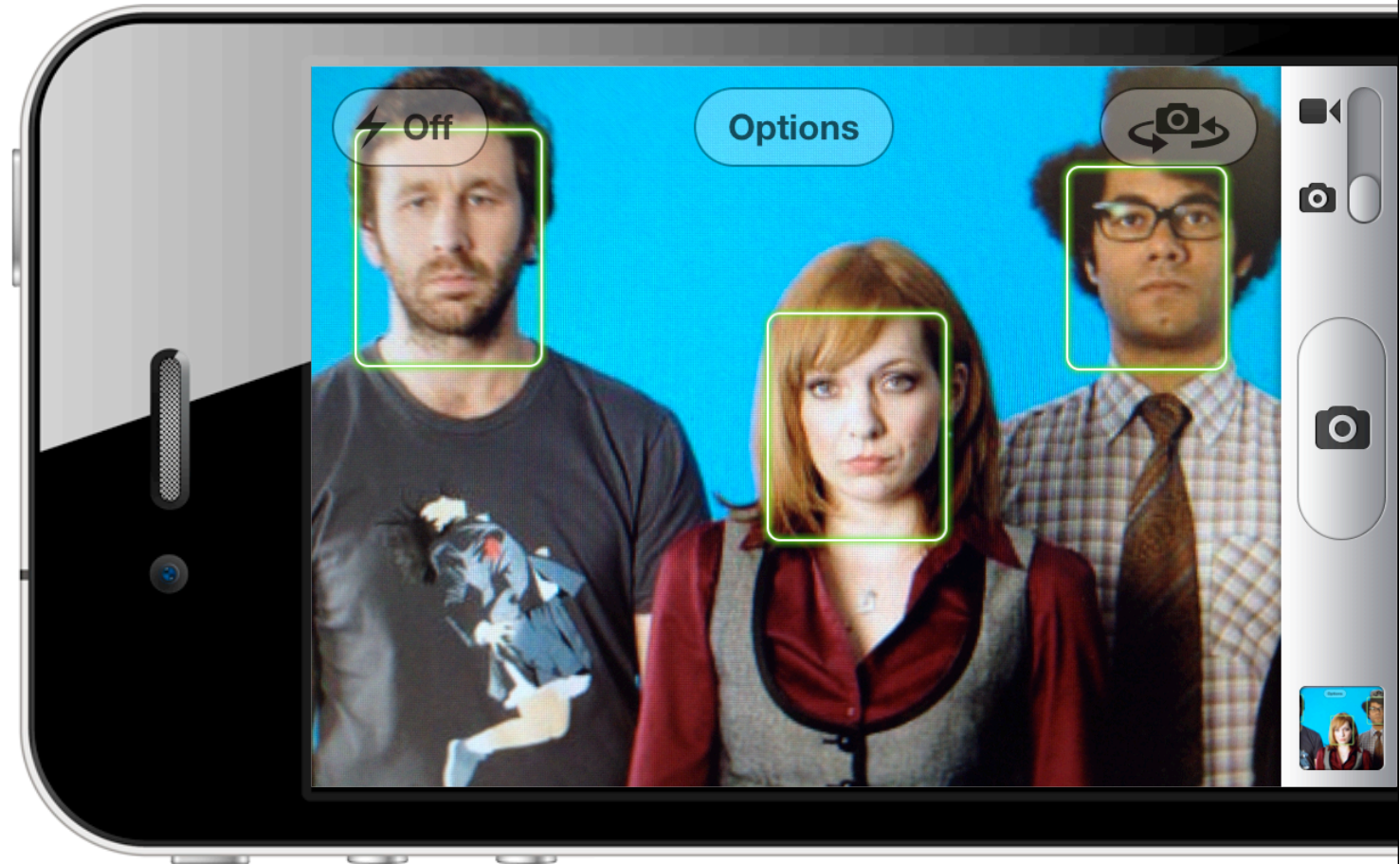






# Facial Detection in iOS 5

Faces within a picture, including the locations of eyes & mouths





# Audio Input

- Language models: “free-form” or “web search”
- Language support: English, Japanese, etc.
- Sends back a list of possible matches (requires network connection)
- Can simply store recordings instead



3G 11:07 AM



akelly



Type to compose

Send



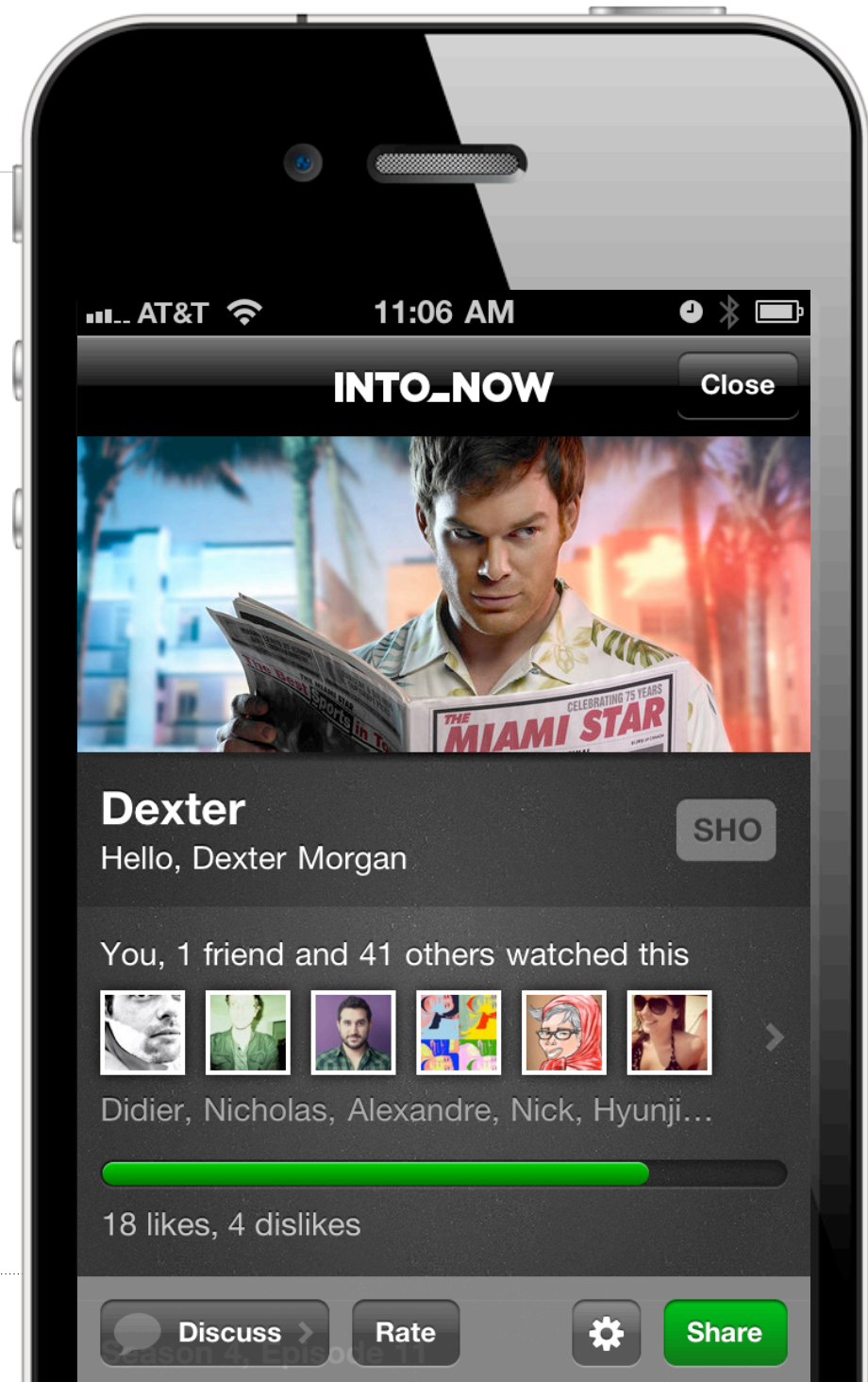


# Audio Input





# Audio Input



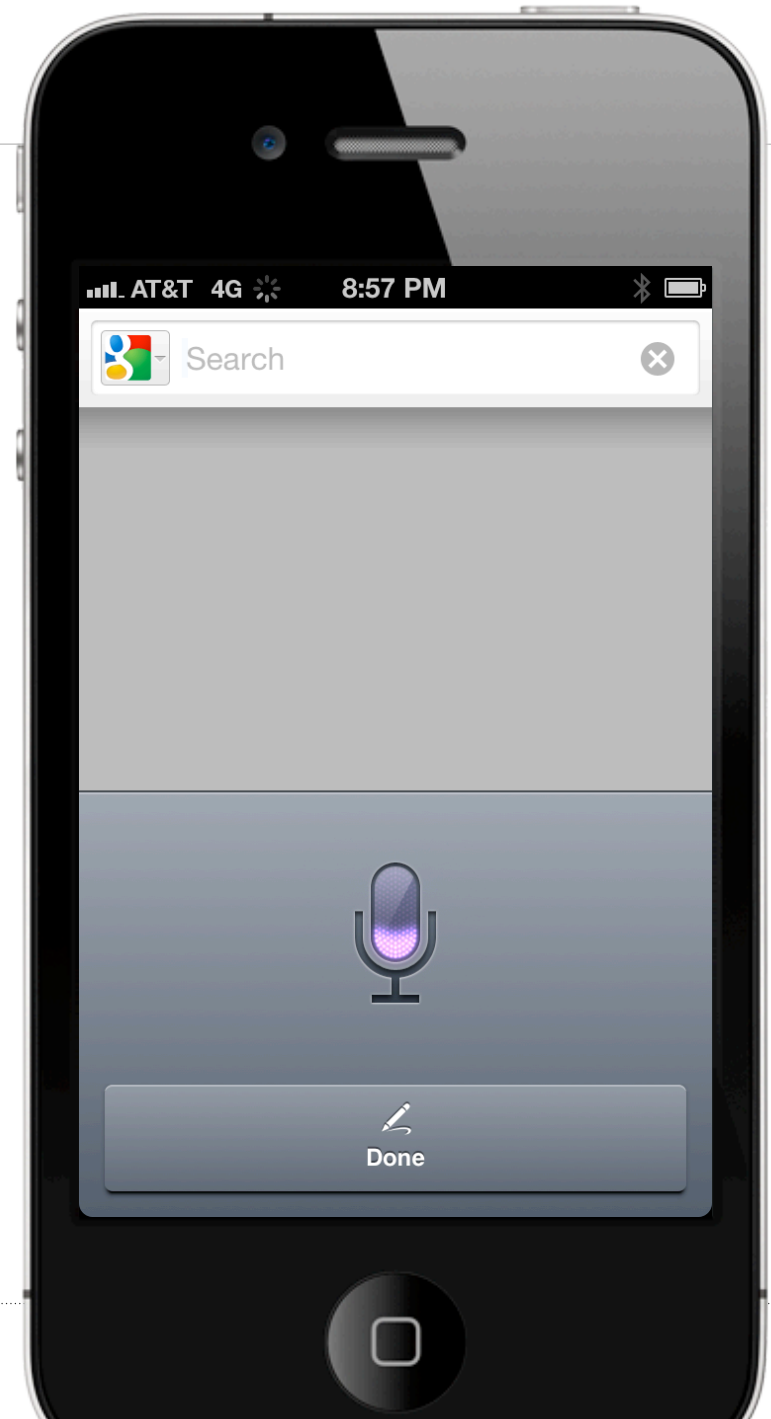
# Proximity Sensor

- An on/off light sensor
- Detects when device is close to face (or when covered)



# Proximity Sensor

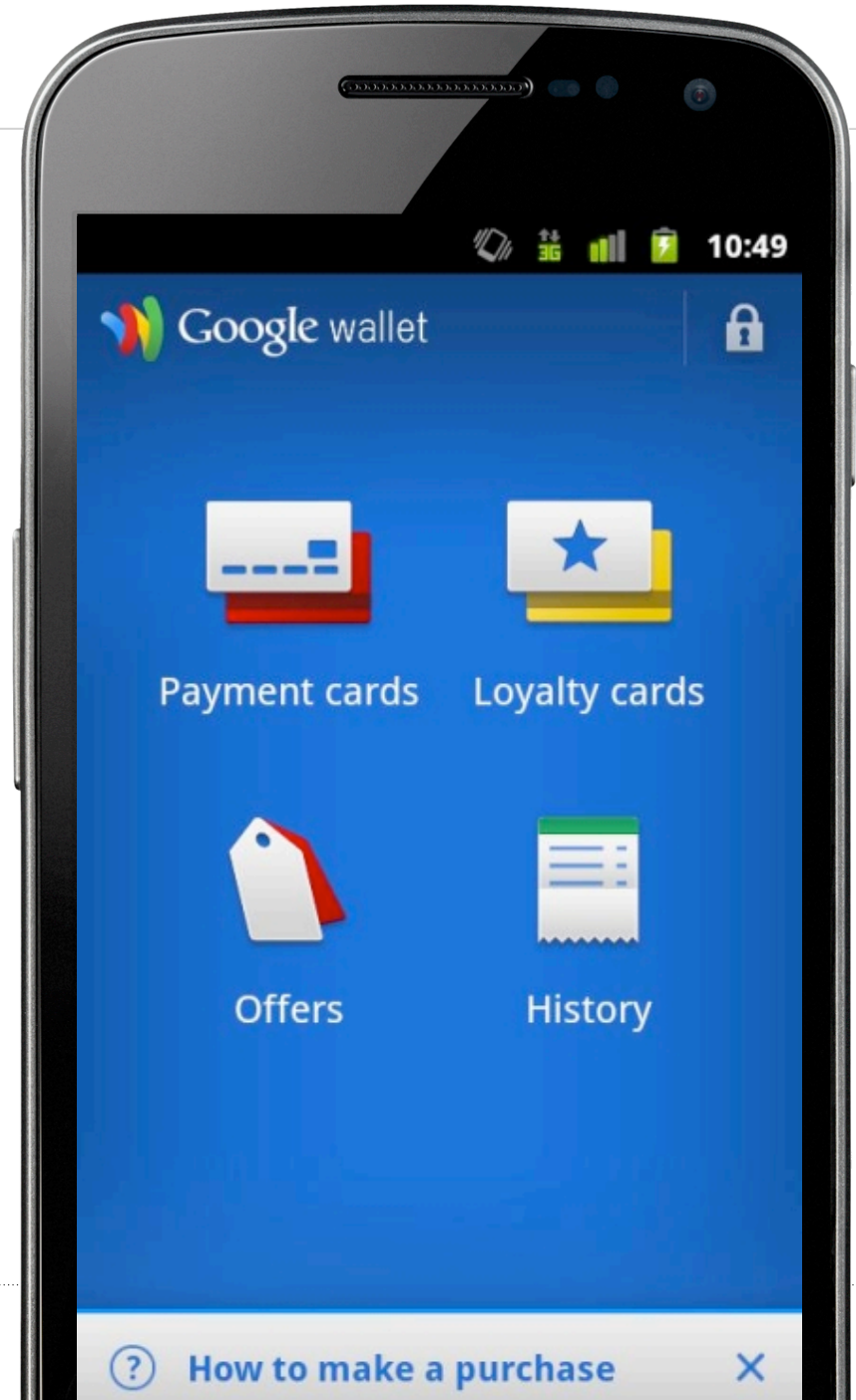
- An on/off light sensor
- Detects when device is close to face (or when covered)





# Near Field (NFC)

- Close-range radio communication between phones/devices, tags
- Require a distance of 4cm or less to initiate a connection
- Can read RFID tags (one-way)

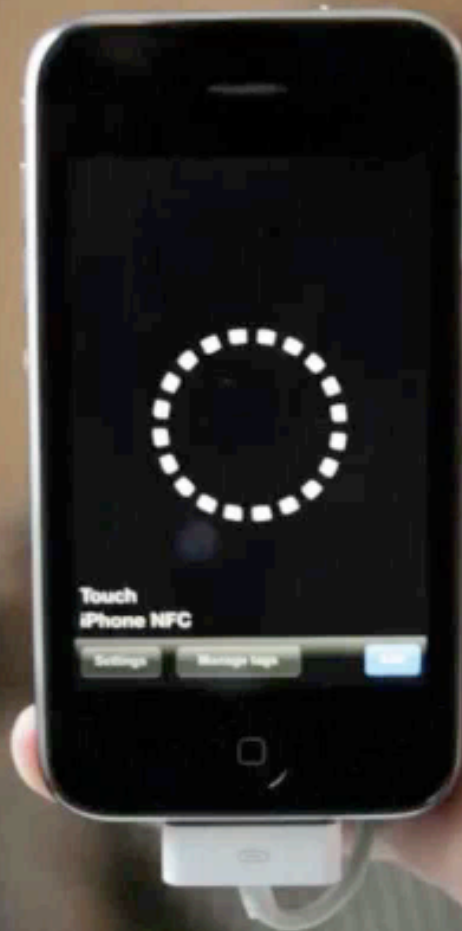




# Near Field (NFC)



iPhone with  
an RFID/NFC  
reader



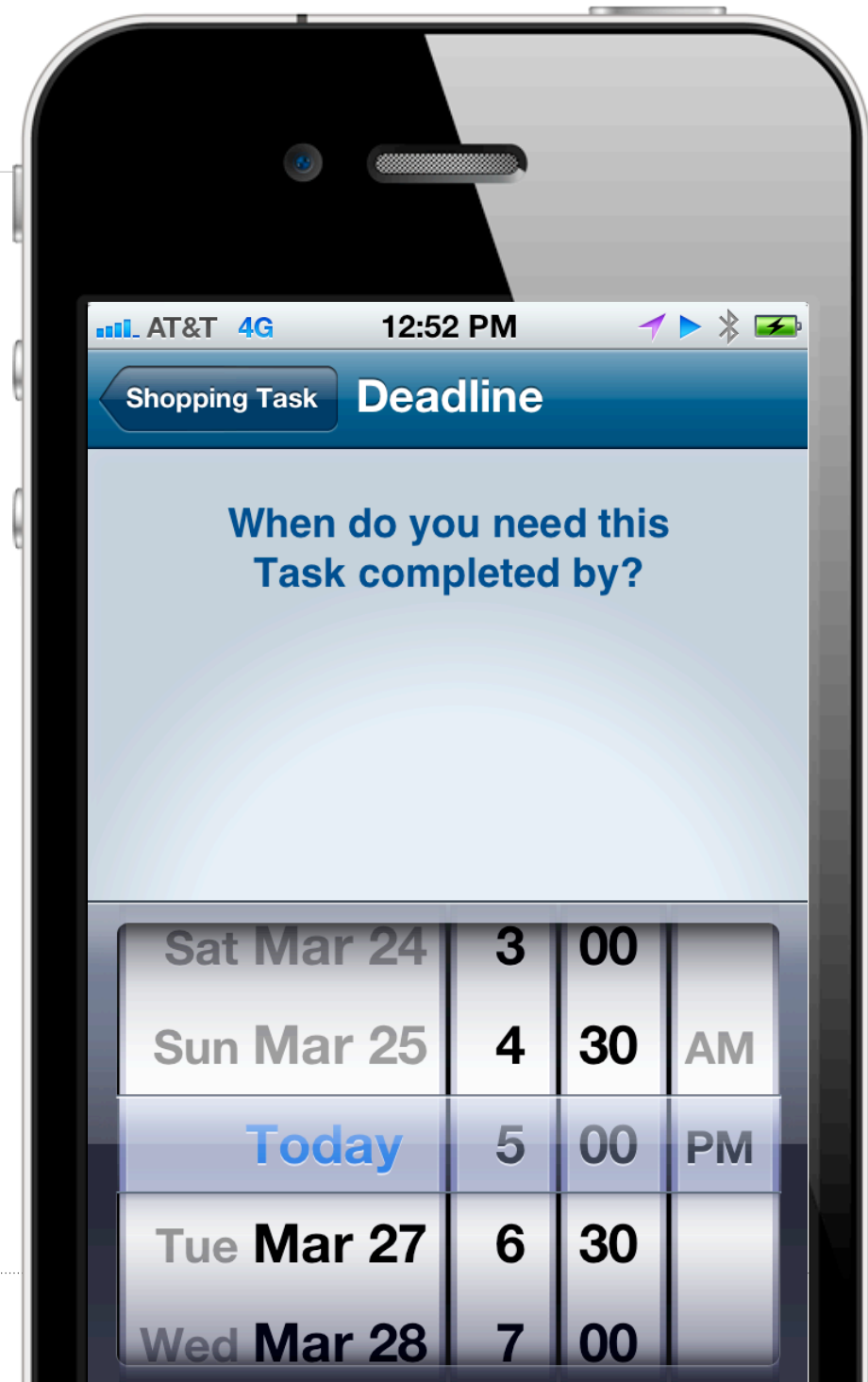


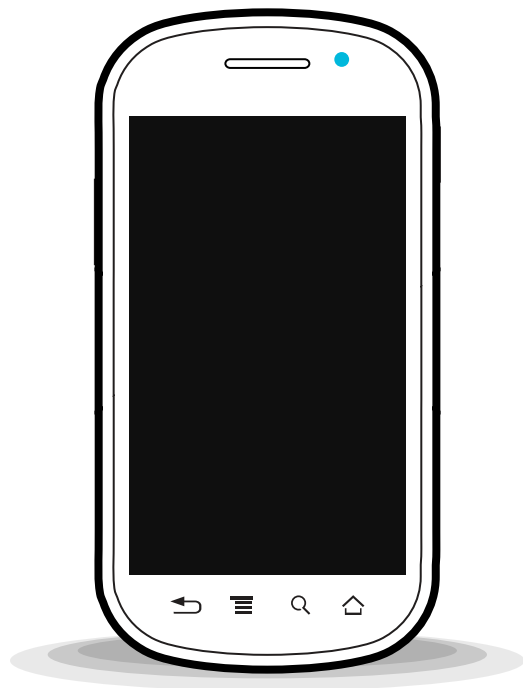
# Mobile Device Capabilities

---

- Location detection
- Multi-touch sensors
- Device positioning & motion: from an accelerometer
- Gyroscope: 360 Degrees of motion
- Orientation: direction from a digital compass
- Video & image: capture/input from a camera
- Dual cameras: front and back
- Audio: input from a microphone; output to speaker
- Ambient Light: light/dark environment awareness
- Proximity: device closeness to physical objects
- NFC: Near Field Communications through RFID readers
- Device connections: through Bluetooth between devices

# Custom Controls





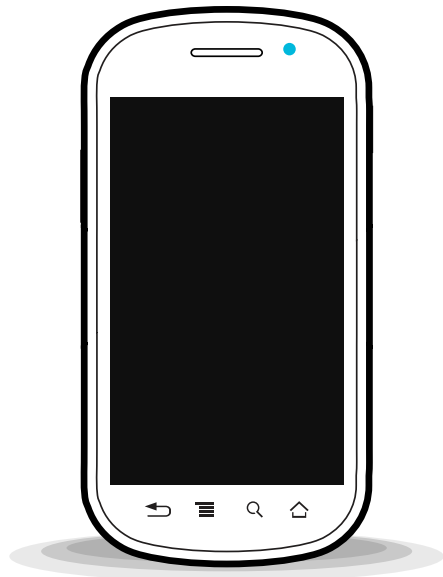
## SOFTWARE

1. Constraints
2. Input fields, types, & more
3. Mobile forms

## HARDWARE

1. Capabilities
2. Rethinking forms

# LOGIN



- Touch Gestures
- Facial Recognition
- SMS Authentication



# Touch Gestures

“Microsoft Windows 8 shows mobile’s influence.”



# Building “Windows 8”

Signing in with a picture password

© 2011 Microsoft

# Password Combinations

	10-digit	A-Z character	Complex character	Multi-gesture
1	10	26	n/a	2,554
2	100	676	n/a	1,581,773
3	1,000	17,576	81,120	1,155,509,083
4	10,000	456,976	4,218,240	6.12157E+11
5	100,000	11,881,376	182,790,400	3.98047E+14

# WHAT ABOUT THE BROWSER?



- Touch Events API
- **touchstart** finger on
- **touchmove** finger dragged
- **touchend** finger removed



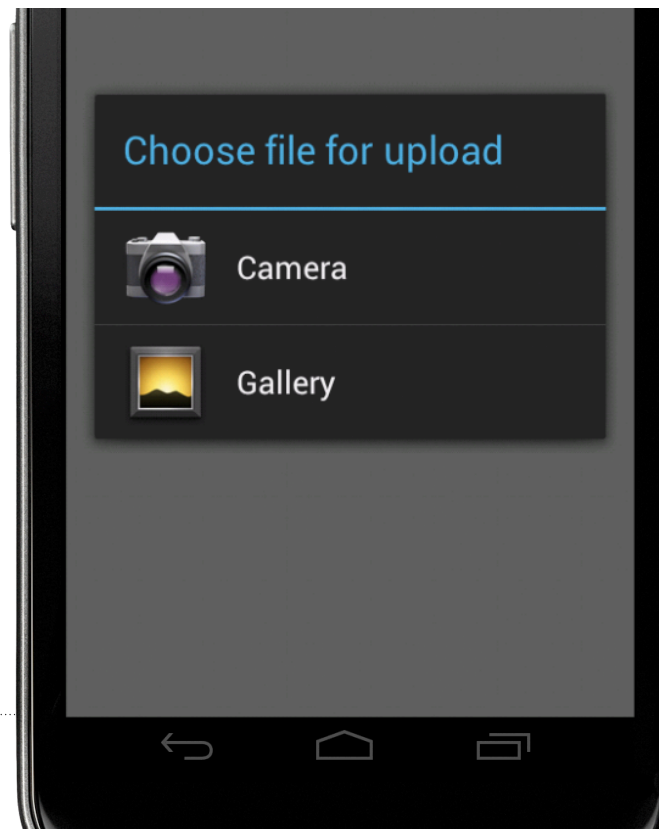
- HTML Media Capture
- Form enhancements that provide access to the audio, image and video capture capabilities of the device

# Android 3.0 +

---

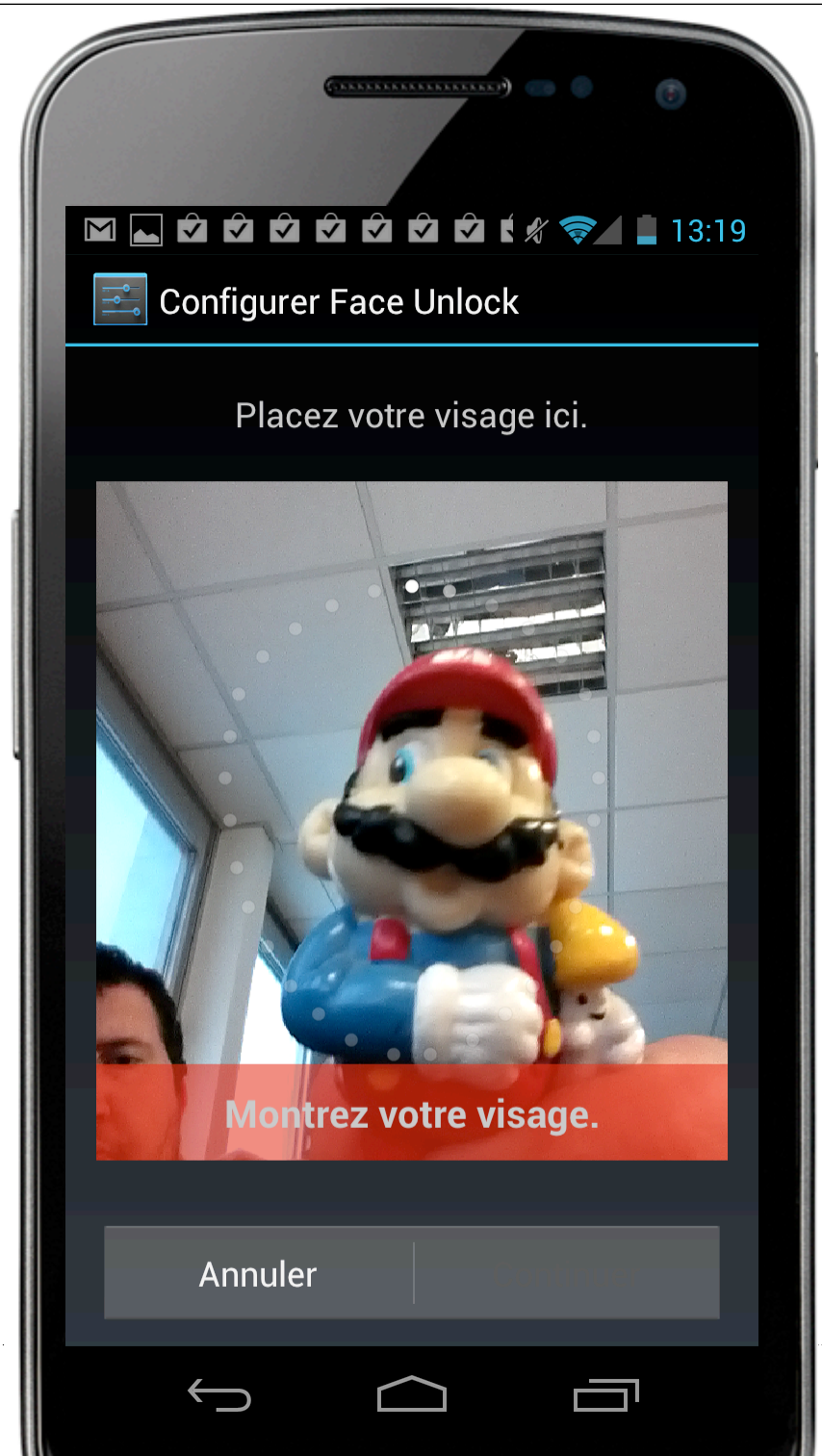


`<input type="file" accept="image/*" capture="camera">`



# Facial Recognition

GALAXY NEXUS

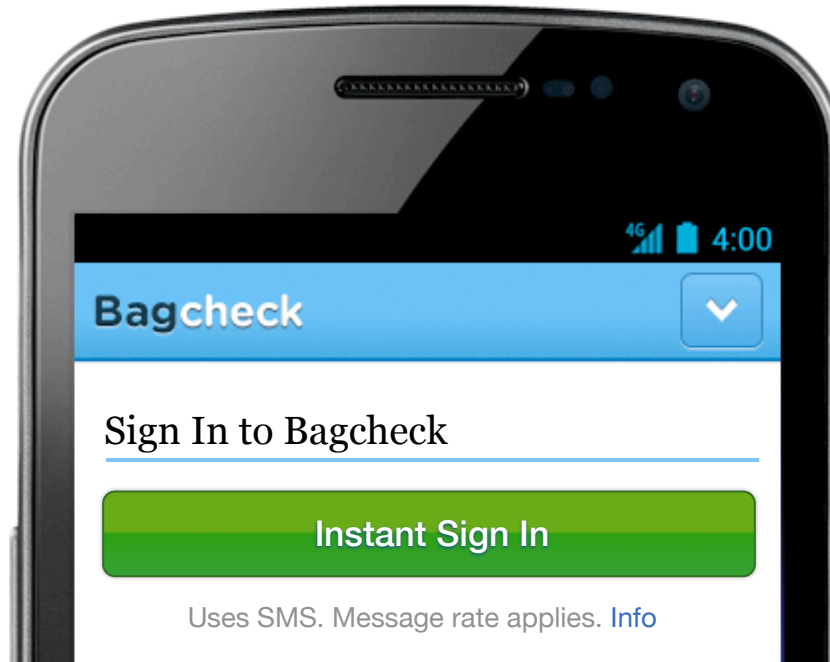


# WHAT ABOUT THE BROWSER?



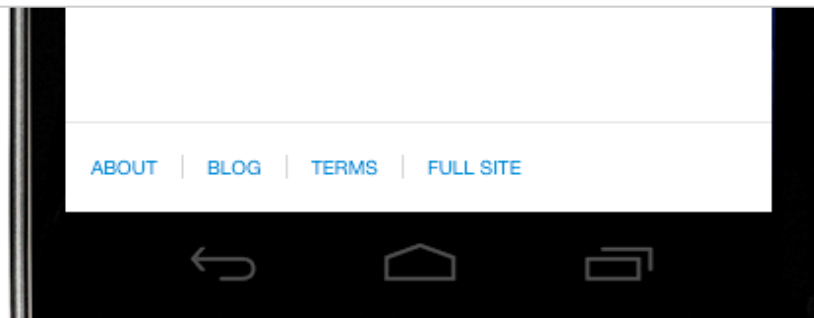
- GetUsermedia API
- Access to local device multimedia data streams
- Video cameras, microphones, Web cams





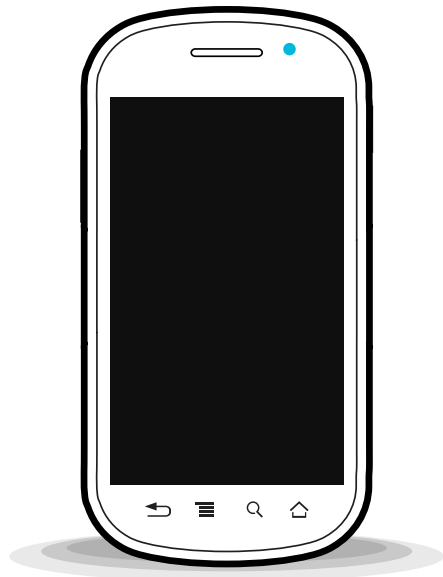
```
navigator.sendMessage("sms:16505551234?" +  
    "body=Sign%20me%20in");
```

```
bondi.messaging.subscribeToSMS(alert("Let In");  
    }, {from: "16505551234"},true);
```



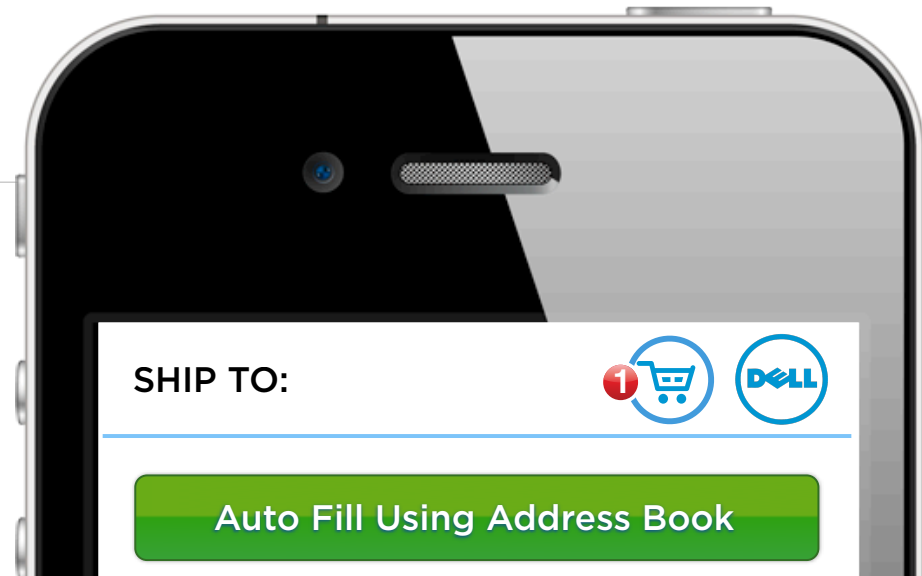
Source: <http://slidesha.re/zBTZ3U>

# CHECKOUT



- Contact Autofill
- Location Detection
- Virtual Shopping
- Self Checkout

# Contacts API



```
navigator.contacts.find({_id: owner});
```



Signature required for delivery. No P.O. boxes

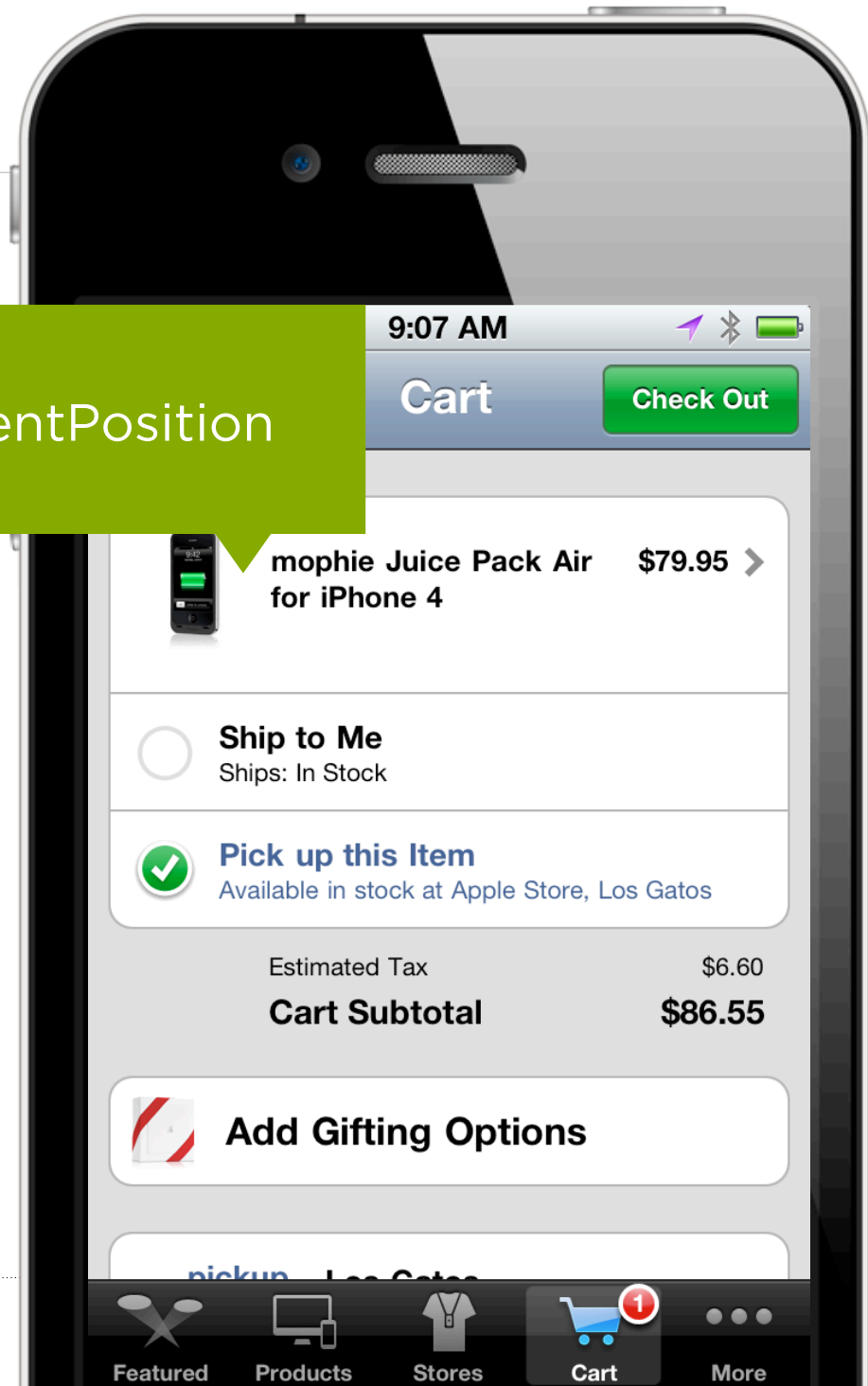
City

State

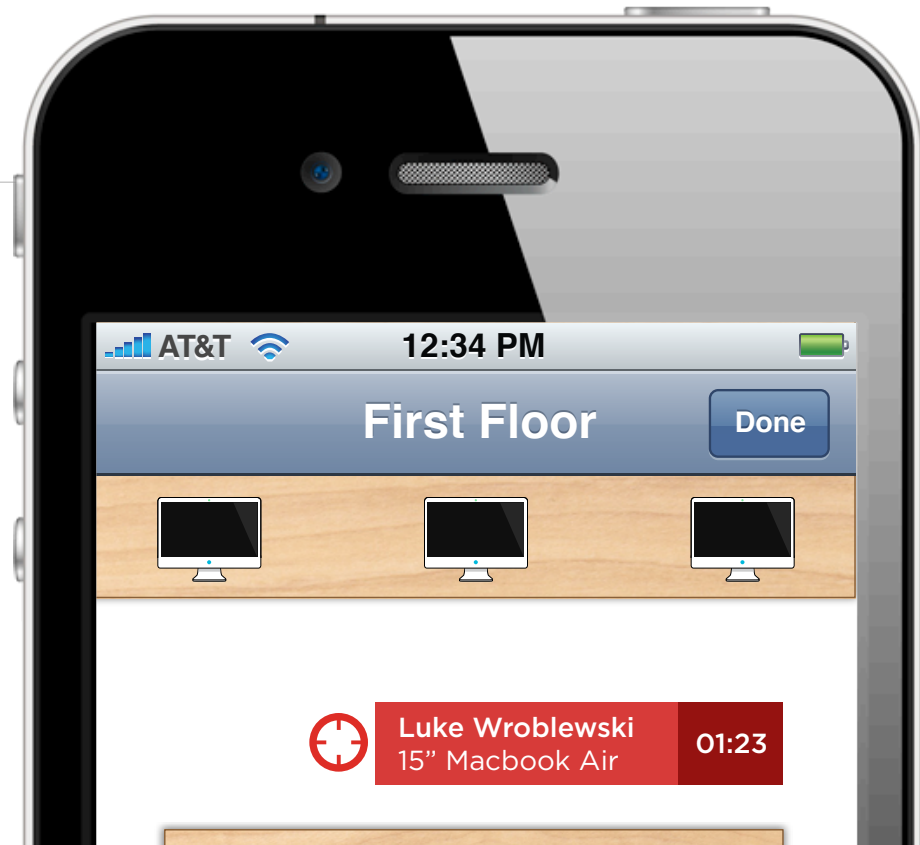
ZIP Code

# Local Purchases

```
if (navigator.geolocation) {  
  navigator.geolocation.getCurrentPosition  
}
```



# Local Purchases



**Web Workers:** API for spawning background scripts in your web application.



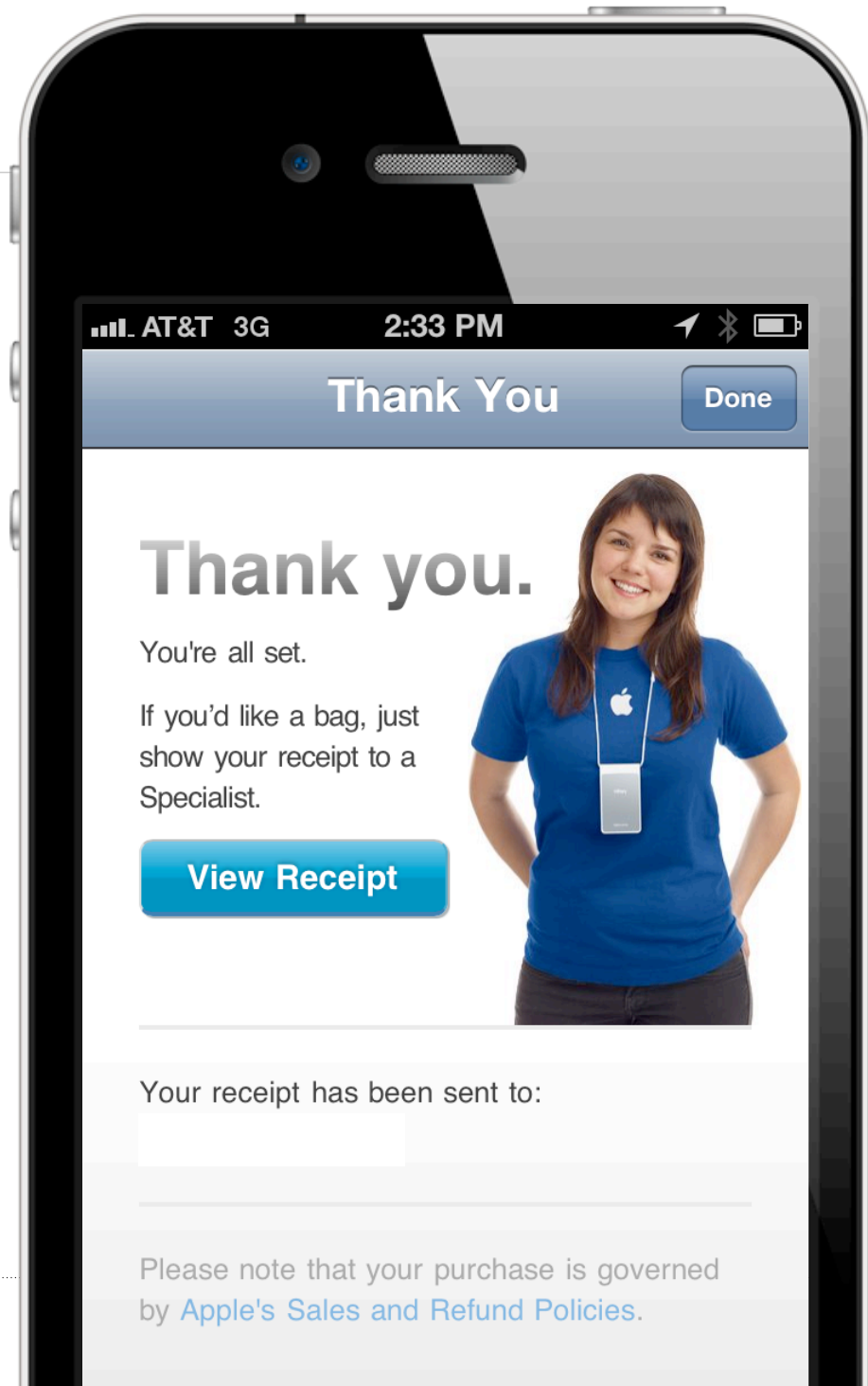




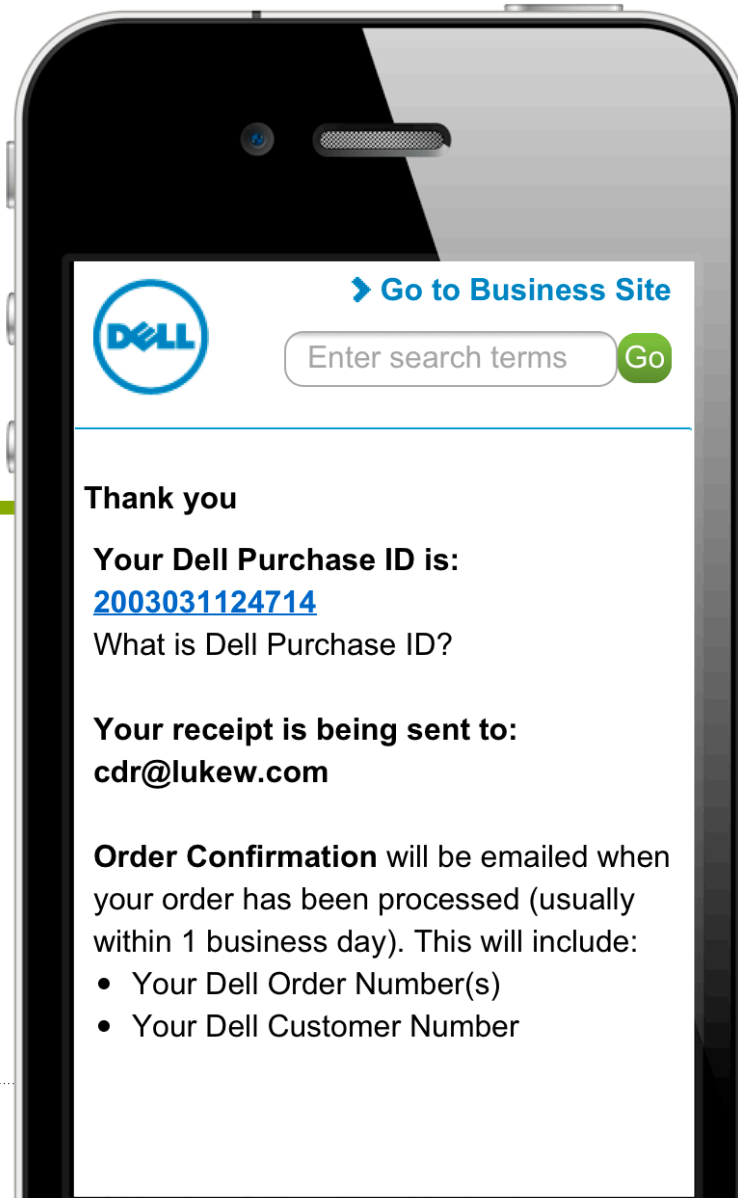
# Self Checkout

50% increase in  
barcode scans  
last year

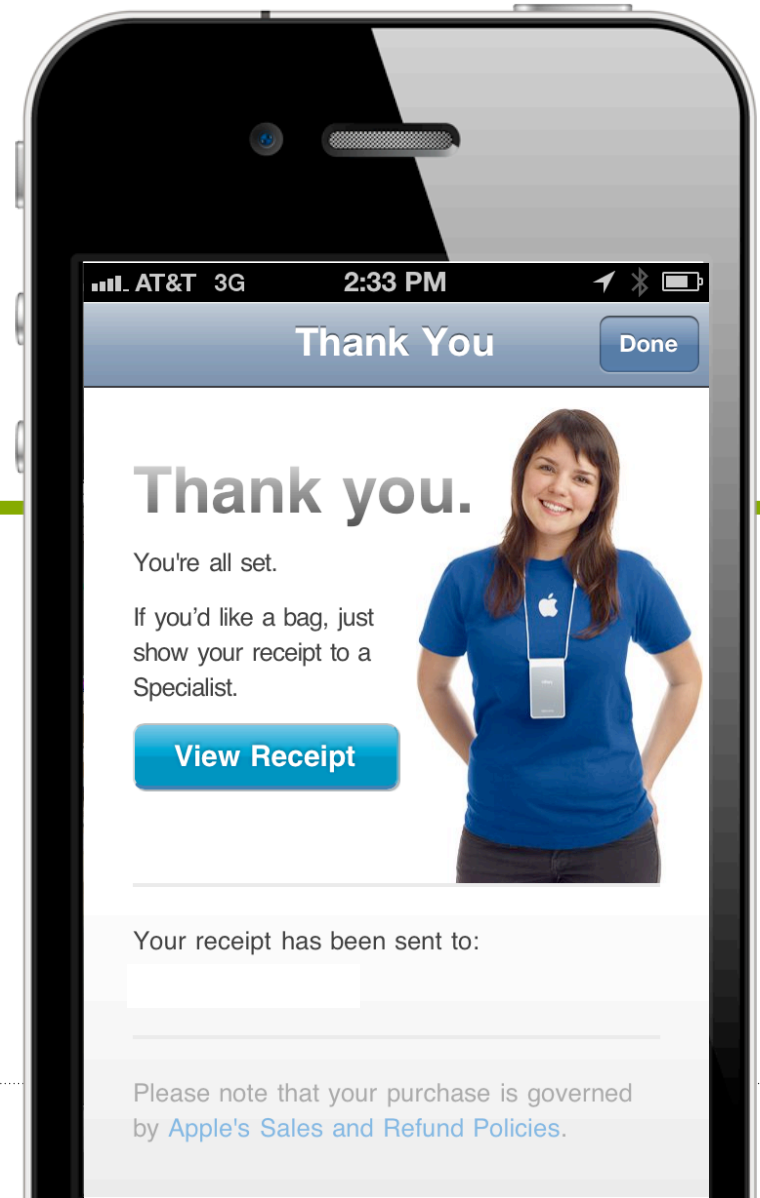
40% online  
prescriptions  
scanned on  
mobile



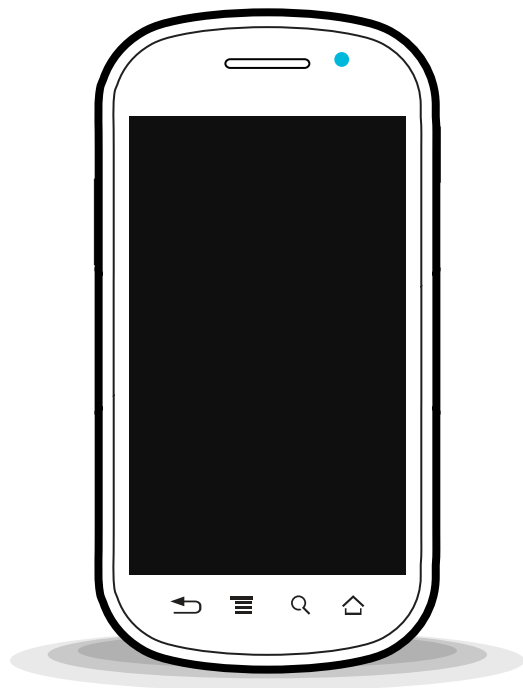
# CHECKOUT



VS.







## SOFTWARE

1. Constraints
2. Input fields, types, & more
3. Mobile forms

## HARDWARE

1. Capabilities
2. Rethinking forms

# THANKS



LUKEW.COM

@LUKEW

**LUKEW**  
IDEATION + DESIGN



A BOOK APART

*Brief books for people who make websites*

NO.

6

Luke Wroblewski

# MOBILE FIRST

**LUKEW**  
IDEATION + DESIGN