MOBILE FIRST

LUKE WROBLEWSKI
OCTOBER 2011

@LUKEW
Web products should be designed for mobile first.
Google programmers are doing work on **mobile applications first**, because they are better apps and that’s what top programmers want to develop.

–Eric Schmidt, Google Chairman
We’re just now starting to think about **mobile first and desktop second** for a lot of our products.”

-Kate Aronowitz, Design Director Facebook
We really need to shift now to start thinking about **building mobile first**. This is an even bigger shift than the PC revolution.”

- Kevin Lynch, CTO Adobe

Flickr photo by jdlasica
“Designing the mobile app **first** forced us to strip down to essentials.”
-Bill DeRouchey, BankSimple
MOBILE FIRST

1. GROWTH = OPPORTUNITY
2. CONSTRAINTS = FOCUS
3. CAPABILITIES = INNOVATION
MOBILE FIRST

1. GROWTH = OPPORTUNITY
2. CONSTRAINTS = FOCUS
3. CAPABILITIES = INNOVATION
Mobile Web growth has outpaced desktop Web growth 8x.
Global mobile data traffic should grow 26x over next 5 years.

Note: PC installed base reached 100MM in 1993, cellphone / Internet users reached 1B in 2002 / 2005 respectively; Source: ITU, Mark Lipacis, Morgan Stanley Research.
Commerce

- Amazon: over $1 billion spent via mobile devices in the past 12 months
- eBay: global mobile sales ~$4 billion in 2011, $2B in 2010, $600M in 2009
- Best Buy: mobile Web users doubling every year: 30M (10), 17M (09), 6M (08)

Social

- Twitter: 40% of tweets sent via mobile, 16% of new users start on mobile
- Instagram: iPhone only 3 months to hit 1M users. Six weeks to 2M
- Mixi (Japan): 85% of page views on mobile vs. 14% 4.5 years ago

Productivity & Media

- Google: mobile searches grew 130% in Q3 2010
- Pandora: 50% of total user base subscribes to the service on mobile
- Email: 70% of smartphone users have accessed email on mobile device

PC vs. Smartphone Shipments

Smartphones **passed** PC shipments in Q42010

Source: [http://bit.ly/g5ktGg](http://bit.ly/g5ktGg)
Shift in Usage

-20% Home usage of PC since 2008

Why? Smartphones & tablets

Source: http://read.bi/efrmCj
Shift in Usage

-7% Visitors to Web-based email sites declined

+36% Visitors accessing email on mobile devices increased

35% of searches come from 7% of users

- 35% of all Yelp searches come from their **mobile applications** which had 3.2 million unique users in Feb 2011
- That month Yelp had 45 million monthly unique users around the world

Additional Usage

• Every other second a consumer calls a local business and generates driving directions from a Yelp mobile app.

• Viewing active listings 45% more often from mobile devices (audience is primarily active buyers, on location or scoping out neighborhoods)

• People that use Facebook on their mobile devices (350M active) are twice as active on Facebook than non-mobile users.

SMARTPHONES

Don’t most people just use native mobile applications to access the Internet?
Twitter Usage

347% increase in mobile browser users (4.7M) Jan 2010

- 40% of tweets sent via mobile
- 16% of new users start on mobile
- What are the top two Twitter mobile clients?
Facebook Usage

112% INCREASE IN MOBILE BROWSER USERS (251M) JAN 2010

• 33% of posts sent via mobile
• What are the top two Facebook mobile clients?
Mobile Web Usage

• Mobile phones will overtake PCs as the most common Web access devices worldwide by 2013
• 600% growth in traffic to mobile websites in 2010
• Avg smartphone user visits up to 24 Web sites visits per day
• Top 50 websites constitute only 40% of all mobile visits
• Opera Mini traffic up 200% yr/yr

MOBILE ONLY?

**BY 2015**

**US: 50+%**
MORE MOBILE THAN PC

**UK: 22%**
NEVER/INFREQUENT DESKTOP USE

**Asia: 50+%**
DON'T USE INTERNET ON PC

**India: 49%**
NEVER/INFREQUENT DESKTOP USE

**Africa: 50+%**
DON'T USE INTERNET ON PC

“My goal was initially just to make a mobile companion, but I became convinced it was possible to create a version of Facebook that was actually better than the website.”

–Joe Hewitt
MOBILE FIRST

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CONSTRAINTS

- Size of Screen
- Speed of Networks
- Modes of Use
Taking a trip this fall? Time to start planning. On March 23rd we’re opening our flight schedule thru October 30th.

Lucky in Luv Sweepstakes
Win Two Tickets Anywhere We Fly

Flexible Travel Dates?
Browse low fares by month from
Oakland, CA – OAK

Featured Destination:
Nashville

Earn enough credits for a
dinner on us

Click ‘n Save
Welcome to Southwest Airlines

- DING! Fare Alerts
- Air Reservations
- Car Reservations
- Flight Check In
- Flight Status
- Rapid Rewards
- More ...
Salaam lukew!
Now you know how to greet people in Arabic!

Recent activity

Uploads from your contacts

Today’s interestingness

Photos taken nearby
Know your audience
<table>
<thead>
<tr>
<th>Traveling to Seattle</th>
<th>Note: Your airport check-in is with Alaska Airlines.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sun 4-Apr-10</strong></td>
<td></td>
</tr>
<tr>
<td>San Jose (SJC)</td>
<td>to Seattle (SEA)</td>
</tr>
<tr>
<td>Depart 6:35 pm</td>
<td>Arrive 8:37 pm</td>
</tr>
<tr>
<td>Terminal C</td>
<td></td>
</tr>
<tr>
<td>Economy/Coach Class</td>
<td>Boeing 737</td>
</tr>
<tr>
<td>Total distance: 699 mi (1,125 km)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Traveling to San Jose</th>
<th>Note: Your airport check-in is with Alaska Airlines.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Tue 6-Apr-10</strong></td>
<td></td>
</tr>
<tr>
<td>Seattle (SEA)</td>
<td>to San Jose (SJC)</td>
</tr>
<tr>
<td>Depart 3:40 pm</td>
<td>Arrive 5:47 pm</td>
</tr>
<tr>
<td>Terminal C</td>
<td></td>
</tr>
<tr>
<td>Economy/Coach Class</td>
<td>Boeing 737</td>
</tr>
<tr>
<td>Total distance: 699 mi (1,125 km)</td>
<td></td>
</tr>
</tbody>
</table>

**American Airlines**

- **Flight:** 6831
- **Operated by:** ALASKA AIRLINES

- **Distance:** 699 mi (1,125 km)
- **Duration:** 2hr 2min

- **Distance:** 699 mi (1,125 km)
- **Duration:** 2hr 7min
# Flight Information

**American Airlines 6831**

**Departs SJC**

**Arrives SEA**

<table>
<thead>
<tr>
<th>Flight Details</th>
<th>Schedule</th>
</tr>
</thead>
<tbody>
<tr>
<td>Departs</td>
<td>6:35 PM</td>
</tr>
<tr>
<td>Arrives</td>
<td>8:37 PM</td>
</tr>
<tr>
<td>Gate</td>
<td>C Gate</td>
</tr>
</tbody>
</table>

**Terminal C**

**Gate --**

<table>
<thead>
<tr>
<th>Flight Details</th>
<th>Schedule</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scheduled</td>
<td>6:35 PM</td>
</tr>
<tr>
<td>Estimated</td>
<td>8:37 PM</td>
</tr>
</tbody>
</table>

- **From:** Norman Y. Mineta San Jose Int.
- **To:** Seattle - Tacoma Int.

**Booked Items**

- **Fare:** $95
- **Total:** $95

**Travel summary**

- **Traveler Name:** Luke Wroblewski
- **Fare Details:** $95
- **Total:** $95

**Flight summary**

- **Status:** No changes, use the ‘Find Flights’ tab.
- **Airline:** American Airlines

**Airline rules & regulations**

- **Change fees:** for most flights, change fees apply.
- **Change requests:** for many flights, changes are not allowed.
- **More information:** for details, please visit [American Airlines](https://www.americanairlines.com) or call their customer service.

**Special requests**

- The flight is non-refundable, as per airline policies.
- For more information, [visit American Airlines](https://www.americanairlines.com) or contact their customer service.

**Customer Support**

- **Phone:** 1-800-433-7300
- **Email:** [contact@americanairlines.com](mailto:contact@americanairlines.com)

**Note:** For the latest flight status and updates, please visit [American Airlines](https://www.americanairlines.com) or contact their customer service directly.
American Airlines 1067
LUKE WROBLEWSKI
Departs DCA
Ronald Reagan Washington National
Estimated 6:25 PM
Terminal B 14A
Scheduled
Arrives DFW
Dallas-Fort Worth Intl.
Estimated 8:40 PM
Confirmation #: CLFIRK
Ticket #: 0017907993808
CONSTRAINTS

- Size of Screen
- Speed of Networks
- Modes of Use
Reduce Requests & File Size

- Eliminate redirects
- Use CSS sprites to serve multiple images
- Consolidate CSS & Javascript into a single file
- Reduce dependencies on heavy Javascript libraries
- Minify your code

Take Advantage of HTML5, etc.

- Use proper http headers for caching
- Load contents lazily
- Use application cache for local content storage
- Use CSS3 and canvas tag instead of images where possible

Source: Make the mobile web faster, Jeremy Weinstein
<table>
<thead>
<tr>
<th>Logo</th>
<th>Delay Time</th>
<th>Impact</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amazon</td>
<td>100ms</td>
<td>delay results in 1% sales loss. (potential $191M in lost revenue in 2008)</td>
</tr>
<tr>
<td>Yahoo!</td>
<td>400ms</td>
<td>delay results in 5-9% drop in full-page traffic.</td>
</tr>
<tr>
<td>Google</td>
<td>500ms</td>
<td>delay drops search traffic by 20%. The cost of slower performance increases over time.</td>
</tr>
<tr>
<td>Bing</td>
<td>1s</td>
<td>delay results 4% drop in revenue</td>
</tr>
<tr>
<td>AOL</td>
<td></td>
<td>Fastest 10% of users stay 50% longer than slowest 10%</td>
</tr>
</tbody>
</table>

Sources: slideshare.net/stubbornella/designing-fast-websites-presentation & slideshare.net/markstanton/speed-matters
CONSTRAINTS

• Size of Screen
• Speed of Networks
• Modes of Use
Big Screen
Power Supply
Consistent Network
Keyboard
Mouse
Chair
Desk
INTENSELY PERSONAL

Small Screen

Battery

Fingers

Sensors
WHERE ARE WE MOBILE?

84% at home
80% during misc. times
74% waiting in lines
64% at work
Partial attention requires focused design.
When are we mobile?

When are we mobile?

When are we mobile?

When are we mobile?

Linkedin **Overall** users

When are we mobile?

Linkedin Mobile users

When are we mobile?

Mobile 3G Traffic Patterns

CONSTRAINTS

- Size of Screen
- Speed of Networks
- Modes of Use
"I was looking at the right side of the Venn diagram I thought, ‘That looks like a lot of the current and planned content for our mobile site.’ I think the only thing we don’t have are the admissions application."
MOBILE FIRST

1. GROWTH = OPPORTUNITY
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Landscape Mode
Landscape Mode
Safari Gyroscope Access

Source: http://bit.ly/gAXCeL
TOUCH

- 1.03M touchscreen phones sold per day (2009)
- 88K iPads sold per day (2011)
- 194K iPhones sold per day (2011)
- 500K Android devices activated per day (2011)
- What about RIM & Nokia?
Indirect Manipulation

TRACKBALL KEYBOARD

TRACKPAD KEYPAD
Direct Manipulation
Nokia smartphone mix

Touch Target Sizes

44px/pt

44px/pt
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
Touch Targets

Bigger then you’re comfortable with
<table>
<thead>
<tr>
<th>Touch Gestures</th>
<th>Platforms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tap</td>
<td>iPhone OS</td>
</tr>
<tr>
<td>Double Tap</td>
<td>Android</td>
</tr>
<tr>
<td>Drag</td>
<td>Web OS</td>
</tr>
<tr>
<td>Flick</td>
<td>Windows Phone 7</td>
</tr>
<tr>
<td>Pinch</td>
<td>OS X</td>
</tr>
<tr>
<td>Spread</td>
<td>Windows 7</td>
</tr>
<tr>
<td>Press</td>
<td>RIM 6.0</td>
</tr>
<tr>
<td>Press &amp; Tap</td>
<td>Ubuntu</td>
</tr>
<tr>
<td>Press &amp; Drag</td>
<td>And more...</td>
</tr>
<tr>
<td>Rotate</td>
<td></td>
</tr>
</tbody>
</table>
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.
<table>
<thead>
<tr>
<th>User Action</th>
<th>Gesture</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Change mode</td>
<td>press</td>
<td>Touch surface for extended period of time</td>
</tr>
<tr>
<td>Open</td>
<td>double tap</td>
<td>Rapidly touch surface twice with fingertip</td>
</tr>
<tr>
<td>Select</td>
<td>tap</td>
<td>Briefly touch surface with fingertip</td>
</tr>
<tr>
<td>User Action</td>
<td>Gesture</td>
<td>Description</td>
</tr>
<tr>
<td>-------------</td>
<td>-----------------</td>
<td>-----------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Delete</td>
<td>Drag (across item or off-screen)</td>
<td>Move fingertip over surface without losing contact.</td>
</tr>
<tr>
<td>Duplicate</td>
<td>Tap (source and destination)</td>
<td>Touch object, then touch elsewhere on surface.</td>
</tr>
<tr>
<td>Move</td>
<td>Drag (and drop)</td>
<td>Move fingertip over surface without losing contact.</td>
</tr>
<tr>
<td></td>
<td>Multi-finger drag</td>
<td>Move two to five fingertips over surface without losing contact.</td>
</tr>
<tr>
<td>user action</td>
<td>gesture</td>
<td>description</td>
</tr>
<tr>
<td>-------------</td>
<td>------------------</td>
<td>--------------------------------------------------------------------</td>
</tr>
<tr>
<td>Pan</td>
<td>drag hand</td>
<td>Move fingers and palm of one hand over surface without losing contact</td>
</tr>
<tr>
<td>Scroll</td>
<td>drag</td>
<td>Move fingertip over scrollbar without losing contact</td>
</tr>
<tr>
<td></td>
<td>two-finger drag</td>
<td>Move two fingers up or down across surface</td>
</tr>
<tr>
<td></td>
<td>press</td>
<td>Touch scrollbar for extended period of time</td>
</tr>
<tr>
<td>Scroll (fast)</td>
<td>flick</td>
<td>Quickly brush surface with fingertip in the direction you want to scroll</td>
</tr>
</tbody>
</table>
Drag to Reveal
Drag to Refresh
Drag to Reveal
Drag to Reveal

- Feature overview
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

Location Detection
## Location Systems

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

Smartphones: hybrid of GPS, Wifi, and cell tower triangulation
Laptops/desktops: WiFi, IP, rarely GPS
Location Detection
Mobile Device Capabilities

- Device positioning & motion: from an accelerometer
- Gyroscope: 360 degrees of motion
- Location detection
- Multi-touch sensors
- 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
- Device connections: through Bluetooth between devices
- Proximity: device closeness to physical objects
- Ambient Light: light/dark environment awareness
- NFC: Near Field Communications through RFID readers
Proposed strike action

The RMT and TSSA unions plan a strike which may disrupt Tube services on 3 and 4 October, Check before you travel

- Press release
- Live travel news
- Journey Planner

Transforming the Tube
- Tube map
- Accessibility

Google gadgets
- How add the Tube service updates to Google homepage

Ticket office changes
Find out more about our plans for Tube ticket office opening hours

Tube
- Rail
- Assisted travel
- Walking

Buses
- Trams
- Coaches

DLR
- Driving
- Taxis & minicabs

Journey Planner

© Transport for London
When discovered by users, Etsy boosted their sustained traffic by 40 to 50 percent.

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

Yelp CEO,
Jeremy Stoppelman
<table>
<thead>
<tr>
<th>Native App</th>
<th>Mobile Web</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="app_icon.png" alt="App Icon" /></td>
<td><img src="web_browser_icon.png" alt="Web Browser Icon" /></td>
</tr>
<tr>
<td>• Location detection</td>
<td>• Location detection</td>
</tr>
<tr>
<td>• Device orientation</td>
<td>• Device orientation</td>
</tr>
<tr>
<td>• Digital compass</td>
<td>• Digital compass</td>
</tr>
<tr>
<td>• Video camera access</td>
<td></td>
</tr>
</tbody>
</table>
Android 3.0 (ish)

**HTML Media Capture**

Allows web applications to access audio, image and video capture capabilities of the device.
SCAN TO CHECKOUT

Flickr photo by Nokia Point & Find
Designing Web Interfaces: Principles and Practices

- Web: 25 items, $17.10
- Local: 7 items, $35.99

Reviews

Map view of local products with pins in various locations.
Designing Web Interfaces: Principles and Patterns for Rich Interactions (Paperback)

Online prices (2) from $31.49
Local prices (1) from $35.99

Amazon.com
Google
Wikipedia
eBay
Images as Input

Google goggles labs

Before:

After:
Images as Input & Output
Images as Input

card.io

Hold credit card here. It will scan automatically.
Images as Input
Nerd.
Found.

Flickr photo by Nokia Point & Find
iPhone with an RFID/NFC reader
Link your token with your Facebook account

Enter number on back of Token:
Enter Token number...

Link Token

TAP TO CHECK-IN TO SESSION

TECHNIQUES
Mobile Device Capabilities

- Device positioning & motion: from an accelerometer
- Gyroscope: 360 degrees of motion
- Location detection
- Multi-touch sensors
- Orientation: direction from a digital compass
- Video & image: capture/input from a camera
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- @lukew
- www.lukew.com

Mobile First!
- abookapart.com