

# Mobile and Multi-device Design

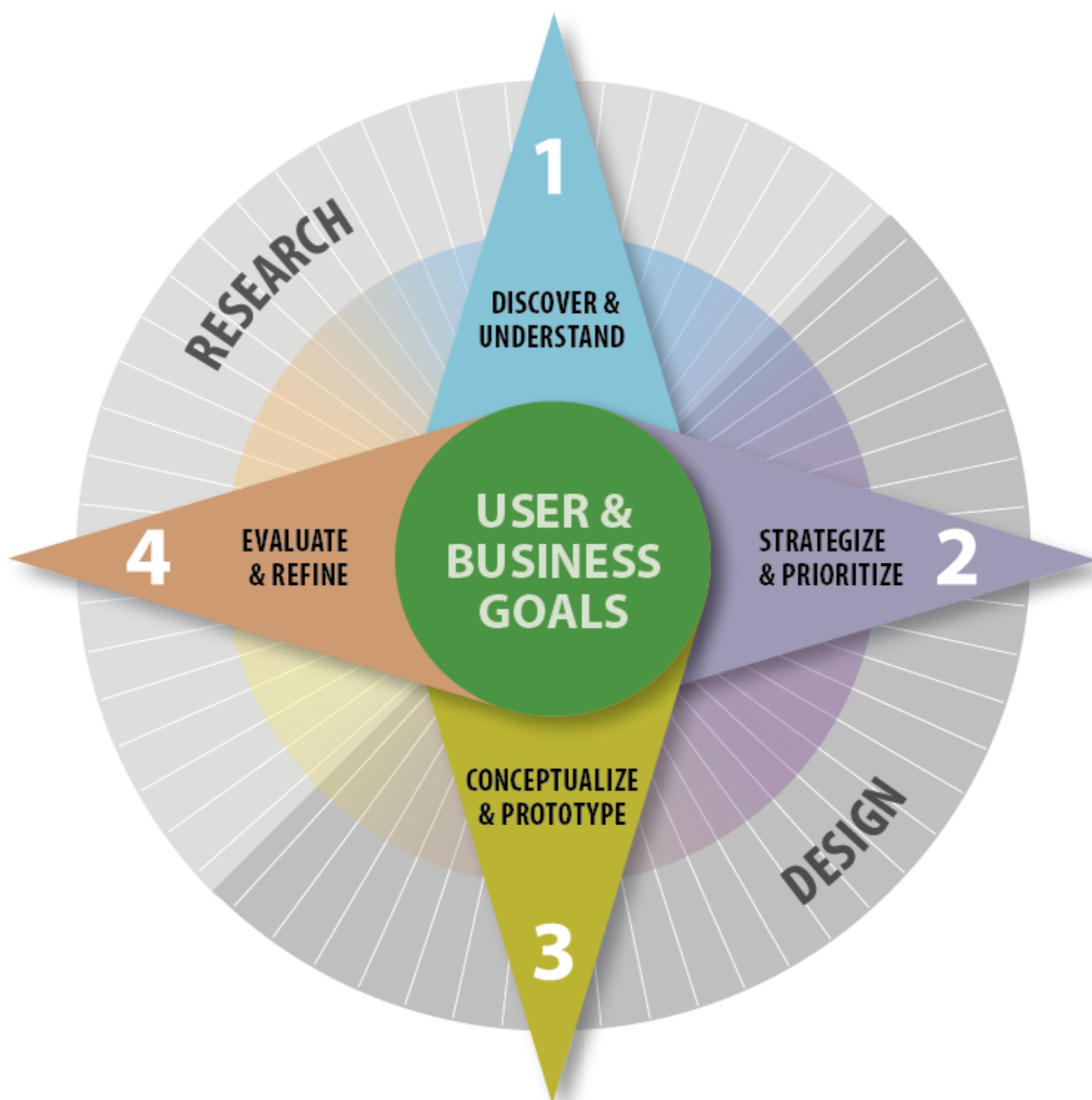
CMPT 363

“The next generation of users is upon us. Their context is touch, mobility and speed. Reaching them requires intuitive design. For better or worse, they are... Mobile First.”

— Jon Fox

*How to design for mobile and  
multi-device usage?*





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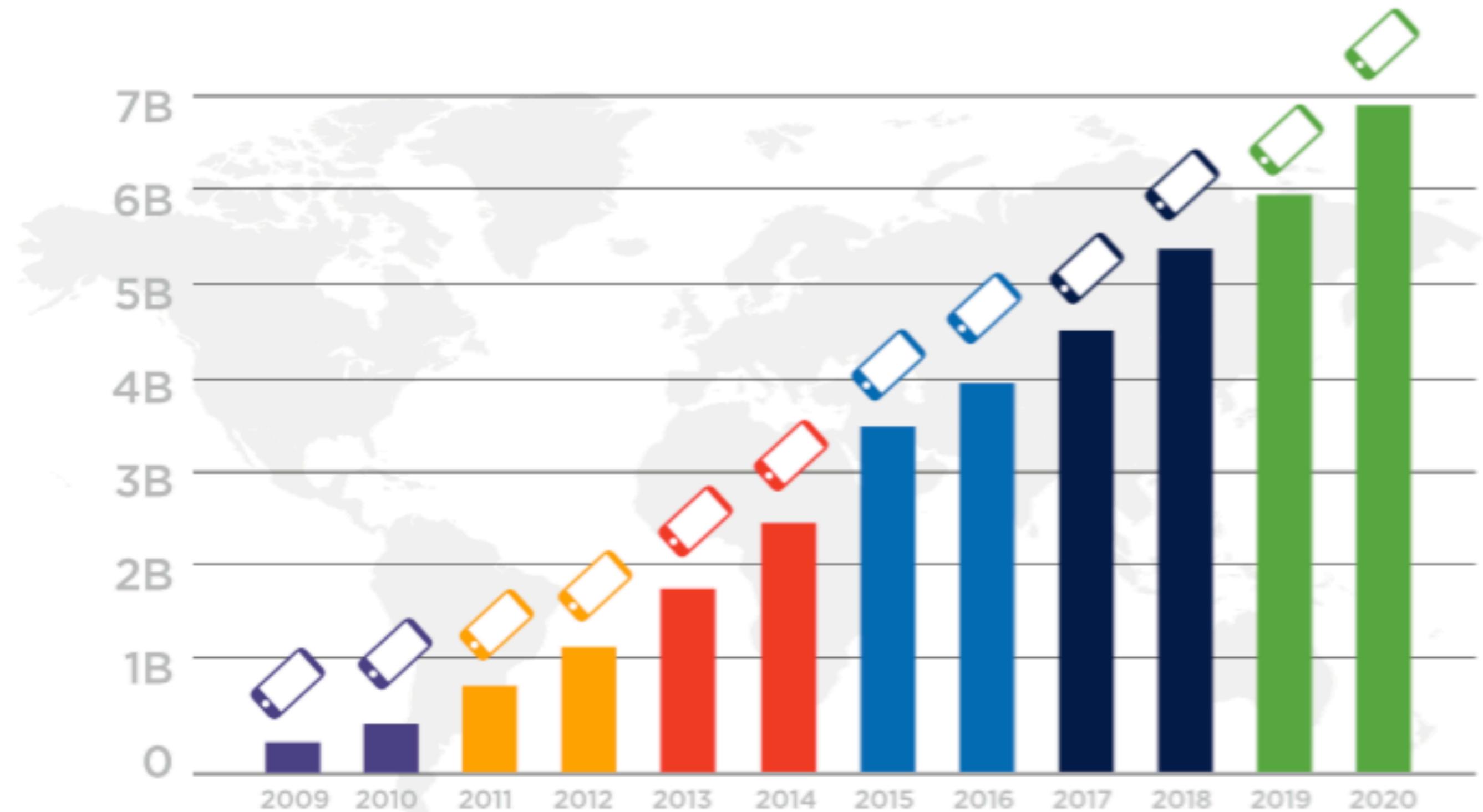
# Topics to Explore

1. “Mobile” Design
2. Touch Interaction Design
3. Responsive Web Design (RWD)

# Mobile and Multi-device Design

“Mobile” Design

# SMARTPHONE USERS: UP 800M

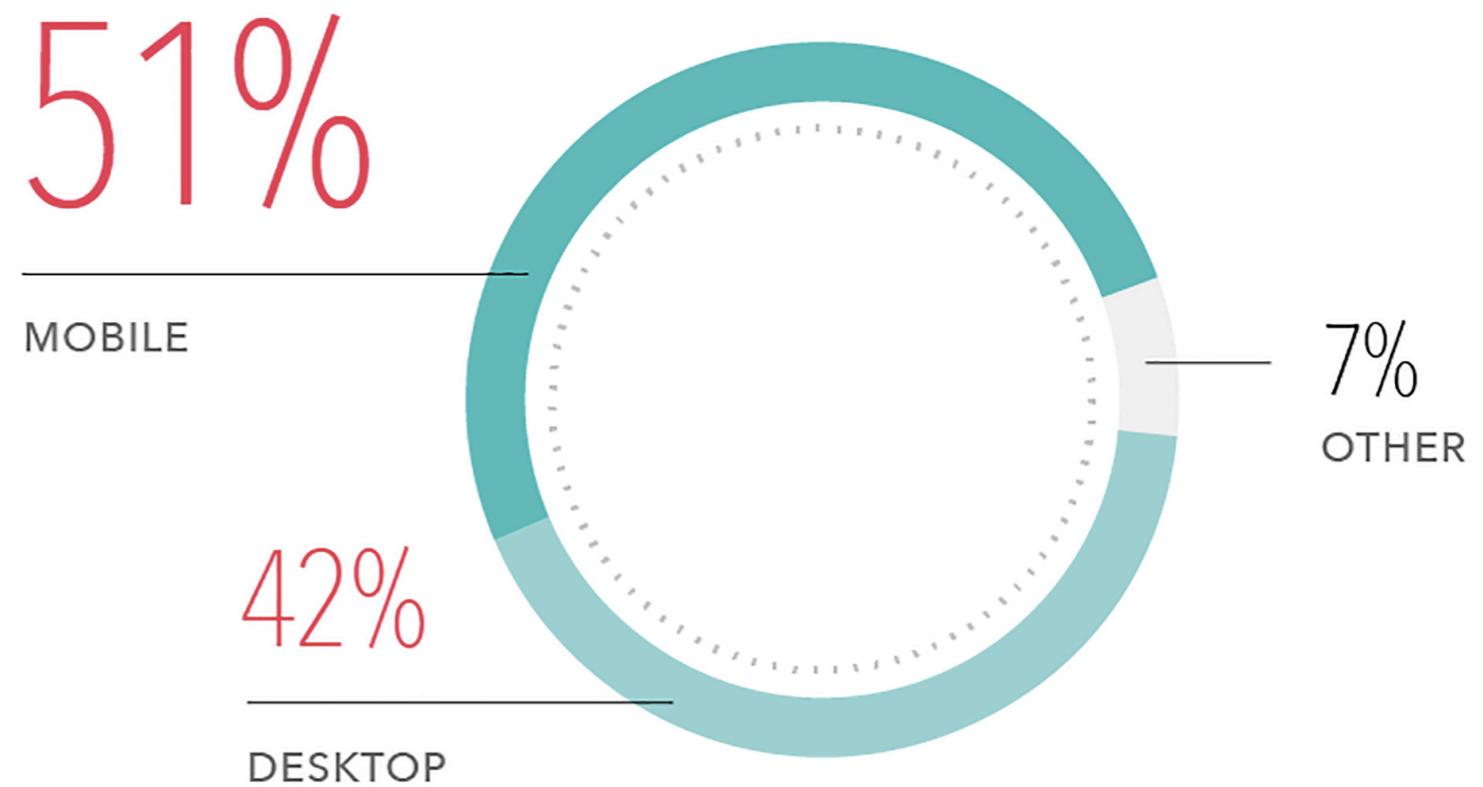


TUNE

TIME SPENT ON MOBILE  
HAS ECLIPSED TIME SPENT  
ON DESKTOP



## MOBILE USAGE

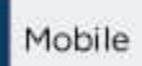
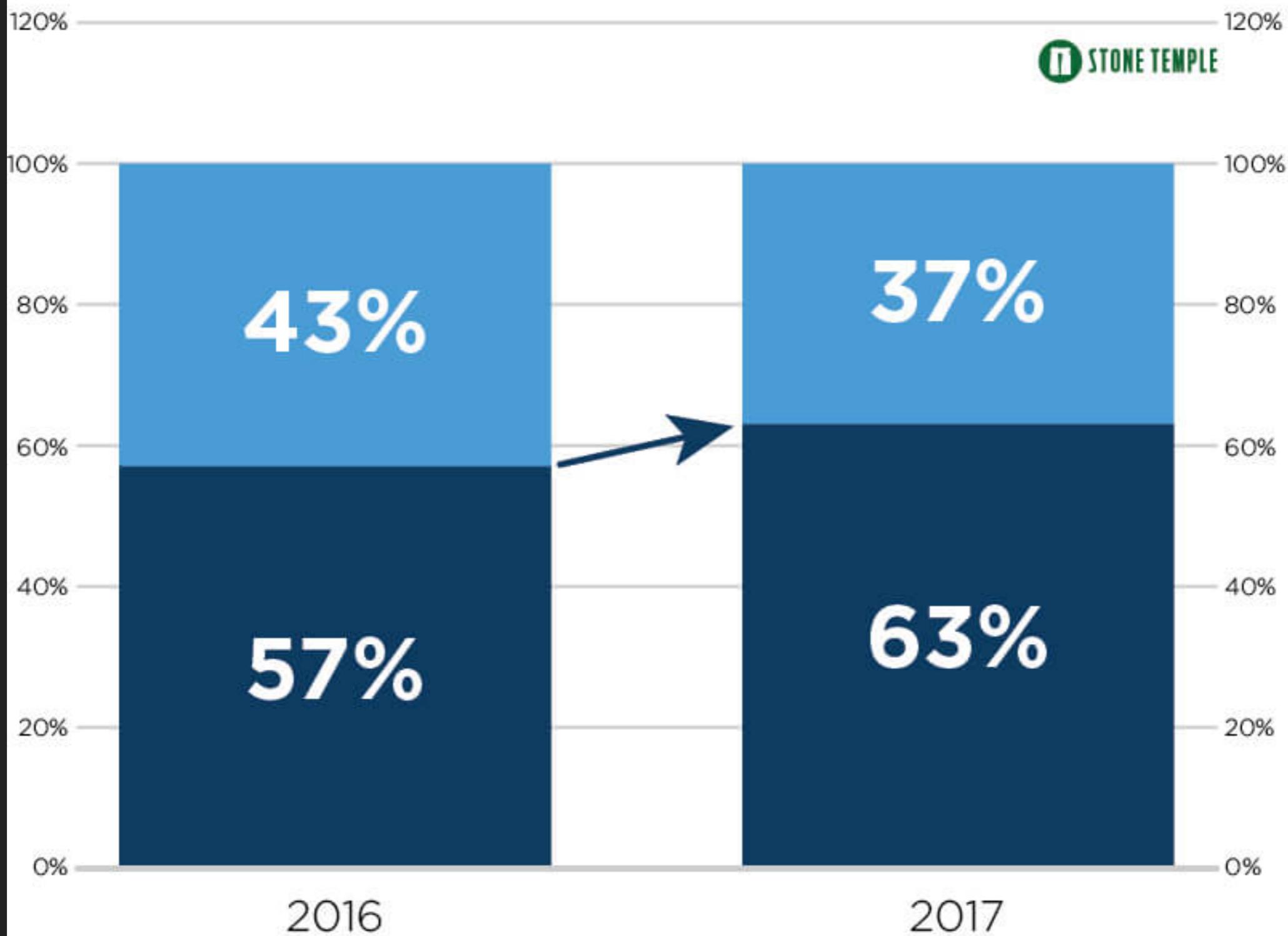


PERCENTAGE INCREASE IN TIME  
SPENT IN MOBILE APPS SINCE 2013

# Total Visits (US)

Based on 1.9 Trillion 2016 visits

Based on 2.0 Trillion 2017 visits

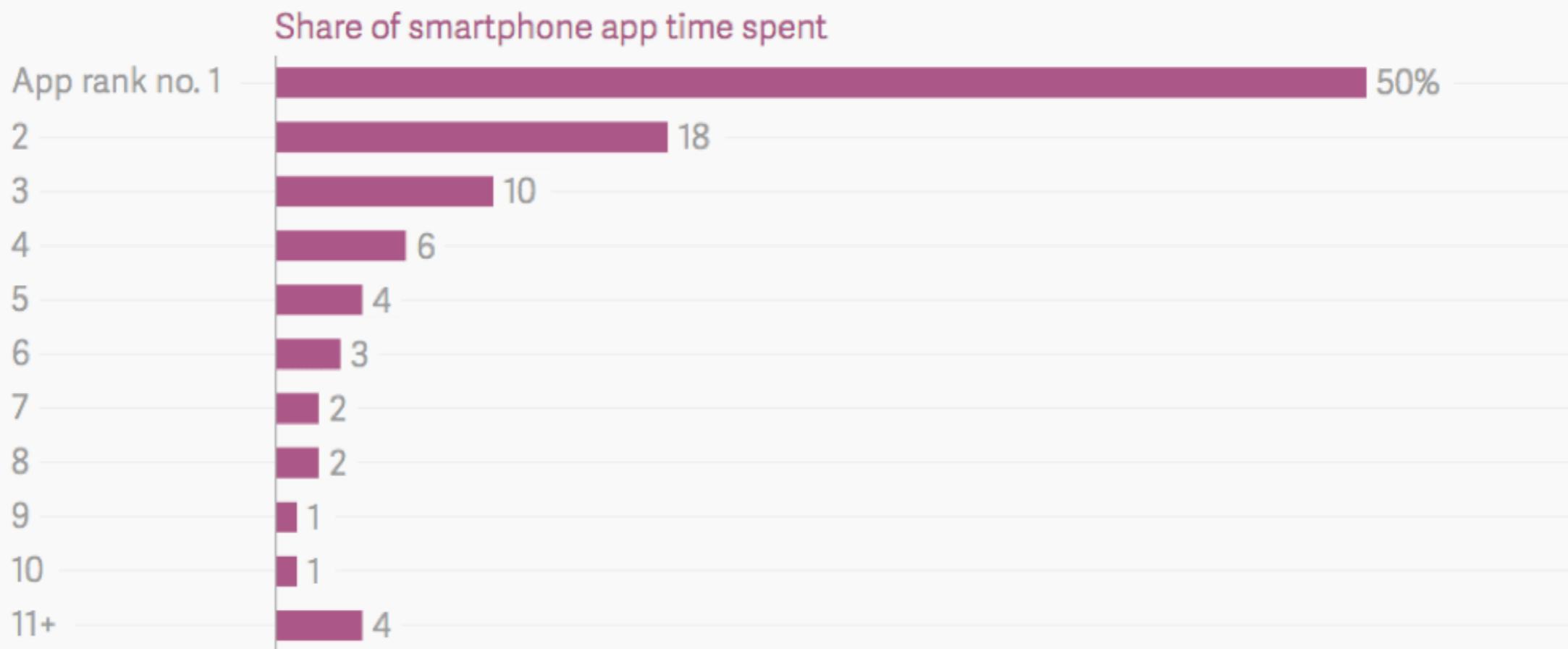


Mobile



Desktop

# Time spent in an average American's most-used apps



# Activity: Defining Mobile

What does the term “Mobile” mean in 2018?



Derek Kessler  
@dkdsgn



Follow

## Samsung Android Screen Sizes:

2.8  
3.14  
3.2  
3.4  
3.5  
3.6  
3.65  
3.7  
3.97  
4  
4.2  
4.27  
4.3  
4.5  
4.52  
4.65  
4.8  
5  
5.3  
5.5  
5.8  
6.3  
7  
7.7  
8  
10  
10.1

Reply Retweeted Favorite More

RETWEETS  
**6,756**

FAVORITES  
**1,763**



6:36 AM - 11 Apr 2013

JAN  
2018

# GLOBAL MOBILE DATA GROWTH

TOTAL MONTHLY GLOBAL MOBILE DATA TRAFFIC (UPLOAD & DOWNLOAD), IN EXABYTES (BILLIONS OF GIGABYTES)

12

10

8

6

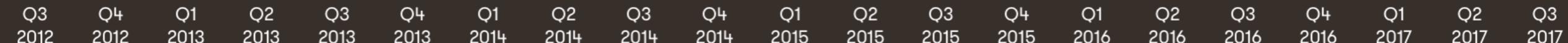
4

2



MONTHLY MOBILE DATA USED BY THE  
AVERAGE SMARTPHONE WORLDWIDE:

**2.9GB**



115

SOURCE: ERICSSON MOBILITY REPORT, NOVEMBER 2017.

| <b>30 minutes</b>                      | <b>3 minutes</b>              | <b>30 seconds</b>  | <b>3 seconds</b>  |
|--|-------------------------------|--------------------|---|
| <b>PCs/Laptops</b>                     | <b>Tablets</b>                | <b>Mobiles</b>     | <b>Smartwatches</b>   |
| Planned use                            | Planned & Unplanned           | Unplanned use      | Unplanned use   |
| Sitting                                | Sitting / Standing            | Standing / Walking | Walking   |
| Booked time                            | Sudden time                   | In Hurry           | Alerts  |
| Creating info                          | Modifying Info                | Consuming Info     | Notification of Info  |
| Focussed task                          | Multi Tasking                 | Multi Tasking      | Multi Tasking   |
| Emails, Work,<br>Presentations, Coding | Social Media, Video,<br>Music | Calls, SMS, OTT    | Information<br>Recording, Alerts,<br>Notifications, Calls<br>and maybe Health<br>monitoring |

- Based on books and presentation by Tomi Ahonen with additional information from eXplanoTech

# False Mobile Assumptions

- Being mobile means being in a rush
- Mobile searches are mostly done on-the-go
- Mobile users are ok with having less
- Context is king (instead think about intent)

# ASUS VivoBook

TOUCH • THE WORLD AT YOUR FINGERTIPS



So, we need to think more  
about multi-device, and not just  
mobile



<https://www.youtube.com/watch?v=WMklcdzcNcU>



<https://www.youtube.com/watch?v=oxqH0XDCCiY>

# CONSTRAINTS

WHILE IT'S TRUE the incredible growth of the mobile internet has been fueled by better and better devices, mobile still remains a very constrained environment. Screens are small, networks are unreliable, and people can find themselves in all kinds of situations when they pull out their mobile devices. But these constraints are not only good for business, they're good for design as well.

This is especially true if you subscribe to the adage that design is the process of gradually applying constraints until an elegant solution remains. In other words, embracing constraints (rather than fighting them) will ultimately get you to better designs.

## SCREEN SIZE

Though the topic of available screen real estate on the desktop was hotly contested for many years in the web design community, we finally settled on 1024×768 pixels as our



# Mobile First

- Mobile First, as defined by Luke Wroblewski in 2009
- Adoption (larger audience for mobile)
- Focus (content and functionality constraints)
- Technologies (touch, geolocation, etc.)

# THIS IS THE WEB.



# THIS WILL BE THE WEB.



# Mobile First, To Me

- When the element of mobility is a core value proposition
- Even given that, I prefer the battle cry of Experience First (HT @kevinmpowell) these days... why?
  - Mobile usage (i.e. “on the go”) is context guessing at best
  - No longer a singular mobile device, but a family of devices
  - Since mobile to me is device independent – I define it as “being close at hand” or “being available”
  - People deserve content/function parity everywhere
  - The best experience should always be leveraged, not constrained, by device attributes





**New Experience.  
All Devices.**

**TIME**



# The New Multi-screen World:

Understanding Cross-platform Consumer Behavior



U.S., August 2012

# There are two modes of multi-screening

## Sequential Usage

Moving from one device to another at different times to accomplish a task

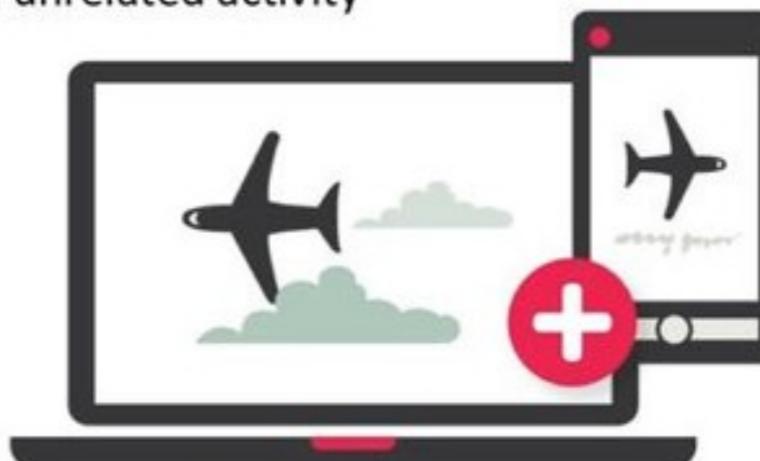


## Simultaneous Usage

Using more than one device at the same time for either a related or an unrelated activity



Multi-tasking - Unrelated activity



Complementary Usage - Related activity

## Sequential screening is common & mostly completed within a day

**90%**

Use multiple screens  
**sequentially** to  
accomplish a task  
over time



**98% move between devices that same day**



## We also multi-screen by using more than one device simultaneously

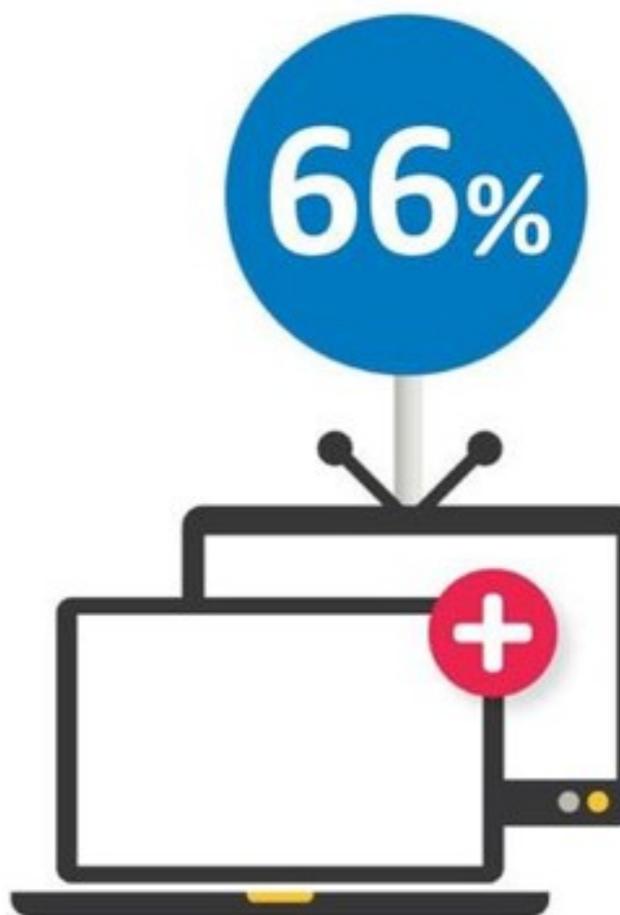
We use an average of three different screen combinations every day



Smartphone & Television

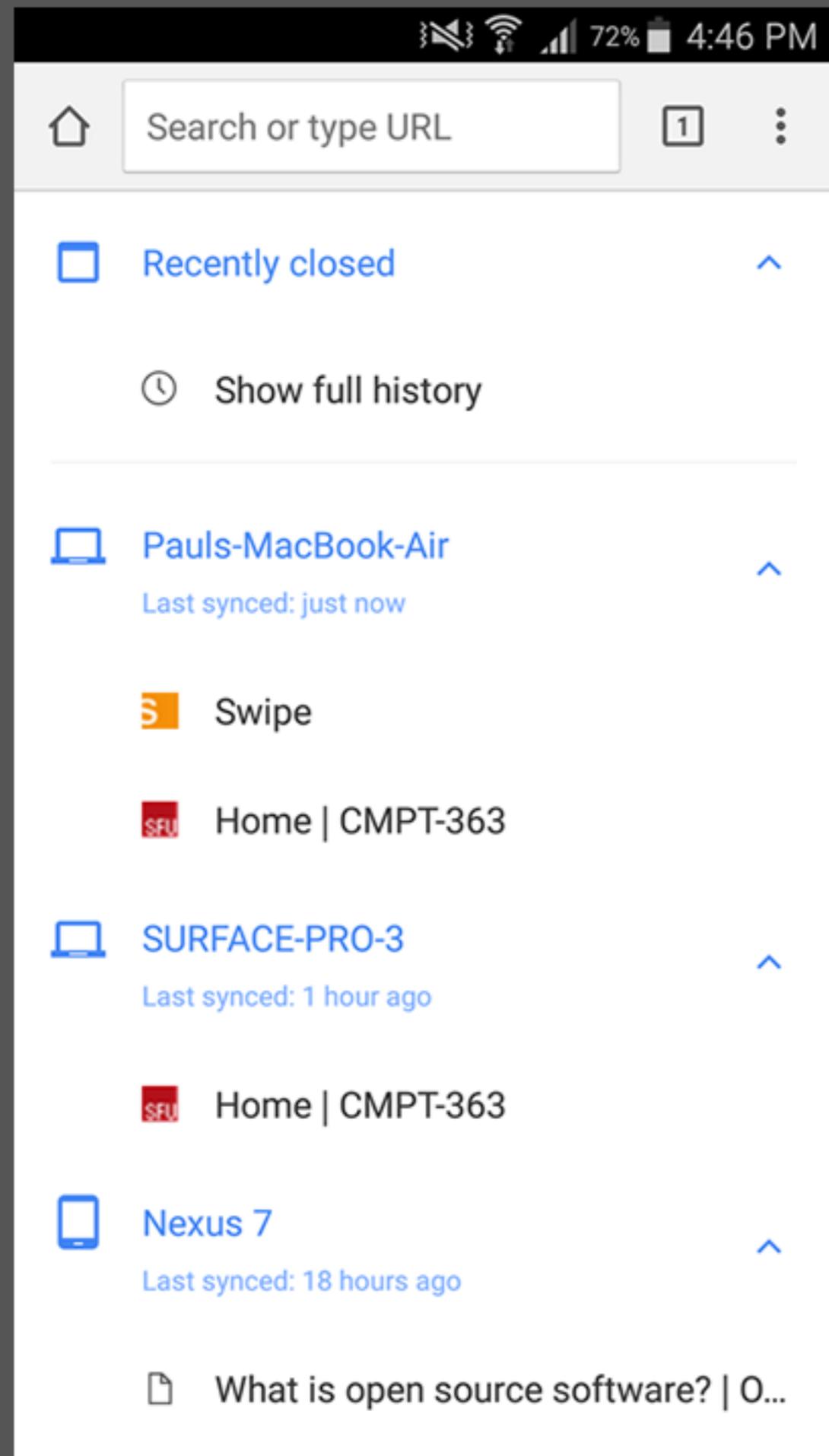


Smartphone & Laptop/PC



Laptop/PC & Television





| History                  |  |
|--------------------------|--|
| <input type="checkbox"/> | <b>Recently Closed</b>                             |
| <input type="checkbox"/> | Home   CMPT-363                                    |
| <input type="checkbox"/> | Home   CMPT-363                                    |
| <input type="checkbox"/> | Swipe  |
| <input type="checkbox"/> | Google News  |
| <input type="checkbox"/> | Ars Technica                                       |
| <input type="checkbox"/> | Central Authentication Service - Simon Fraser U... |
| <input type="checkbox"/> | Brad Frost Web   Web Design, Speaking, Consu...    |
| <input type="checkbox"/> | CMPT 363 Mobile and Multi-device Design - S...     |
| <input type="checkbox"/> | <b>SURFACE-PRO-3</b>                               |
| <input type="checkbox"/> | \$FU Home   CMPT-363                               |
| <input type="checkbox"/> | <b>Nexus 7</b>                                     |
| <input type="checkbox"/> | What is open source software?   Opensource.c...    |
| <input type="checkbox"/> | <b>Lenovo YT3-X90F</b>                             |
| <input type="checkbox"/> | Vancouver, British Columbia 7 Day Weather For...   |
| <input type="checkbox"/> | Review Your Itinerary...                           |
| <input type="checkbox"/> | \$FU Home   CMPT-363                               |

# Multi-device Experience Goals

- Conceptual and visual consistency
- Content and functionality parity
- Seamless task transferability
- Think ecosystem, not isolated devices
- Optimize physical interactions on every device

# Google Mobile Design Principles

- Home page and site navigation (1 of 5 categories)
  - Keep calls to action front and center
  - Keep menus short and sweet
  - Make it easy to get back to the home page
  - Don't let promotions steal the show

[developers.google.com/web/fundamentals/design-and-ux/principles/](https://developers.google.com/web/fundamentals/design-and-ux/principles/)

# iOS Mobile Design Principles

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

iOS Design Principles

What is common between  
these two sets of mobile design  
principles?

# Time for Questions & Discussion

- What we've covered so far
  - Mobile usage statistics
  - Expect touchscreens everywhere
  - Do not context guess with “mobile assumptions”
  - Experience first vs. mobile first
  - It is a multi-screen world
  - Mobile design principles
- Coming up
  - Touch interaction design

# Mobile and Multi-device Design

Touch Interaction Design

# Does Samsung make too many phones and tablets?



| Galaxy Phone | Size      | Galaxy Phone | Size     | Galaxy Tablet | Size      |
|--------------|-----------|--------------|----------|---------------|-----------|
| Y            | 3 inch    | S4           | 5 inch   | Note 8.0      | 8 inch    |
| Young        | 3.27 inch | S4 Active    | 5 inch   | Tab 3         | 8 inch    |
| Ace          | 3.5 inch  | S4 Nexus     | 5 inch   | Tab           | 10.1 inch |
| Fame         | 3.5 inch  | Note         | 5.3 inch | Tab 2         | 10.1 inch |
| Ace 2        | 3.8 inch  | Note 2       | 5.5 inch | Tab 3         | 10.1 inch |
| Ace 3        | 4 inch    | Mega         | 5.8 inch | Note 10.1     | 10.1 inch |
| S3 Mini      | 4.3 inch  | Mega         | 6.3 inch |               |           |
| S4 Mini      | 4.3 inch  | Tab 2        | 7 inch   |               |           |
| S4 Zoom      | 4.3 inch  | Tab 3        | 7 inch   |               |           |
| S3           | 4.8 inch  | Tab          | 7.7 inch |               |           |

Which?



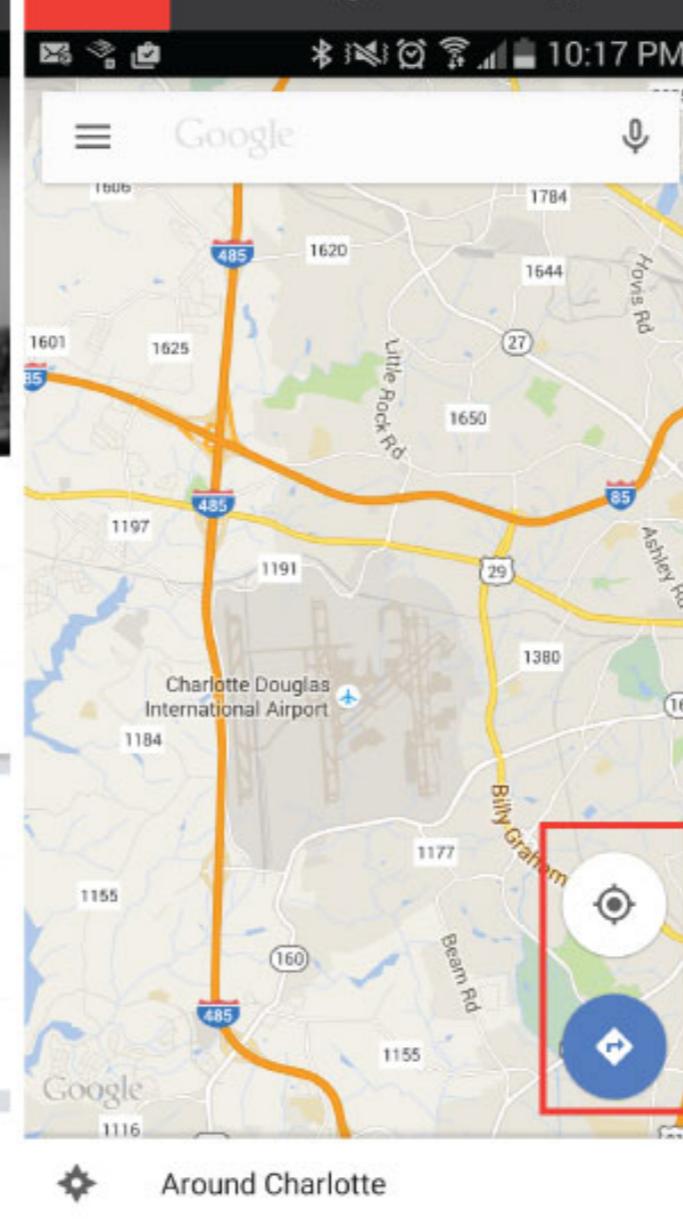
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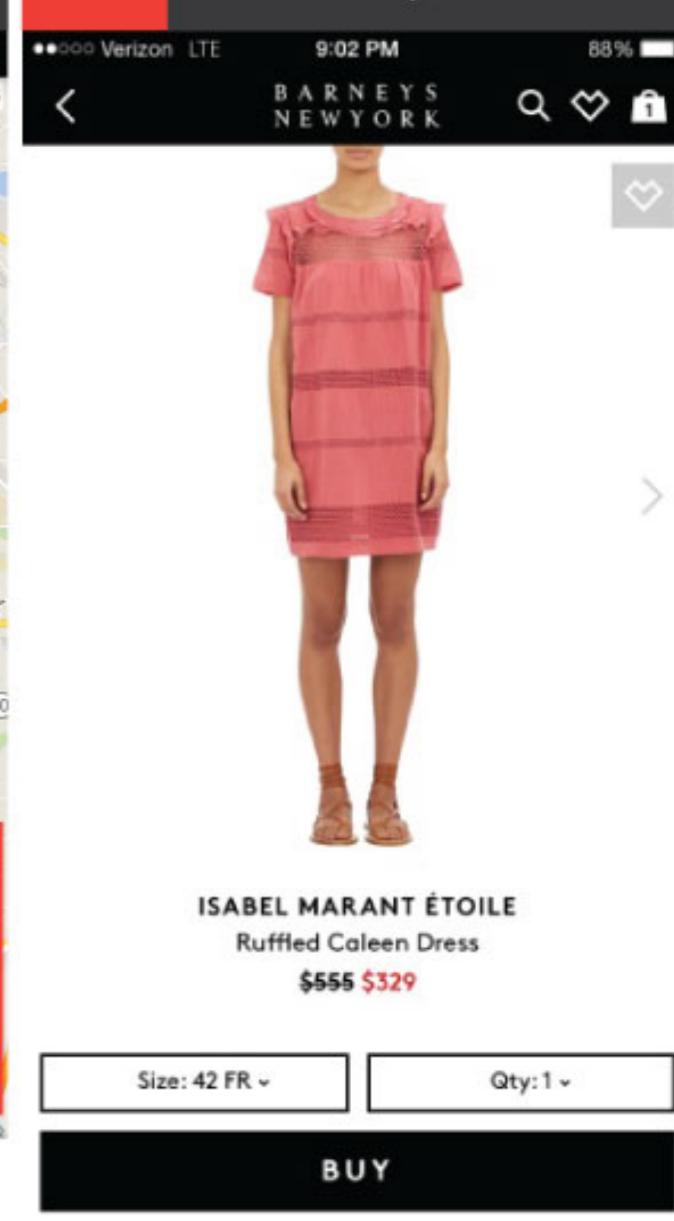
## 2 Facebook



## 3 Google maps



## 4 Barneys NY

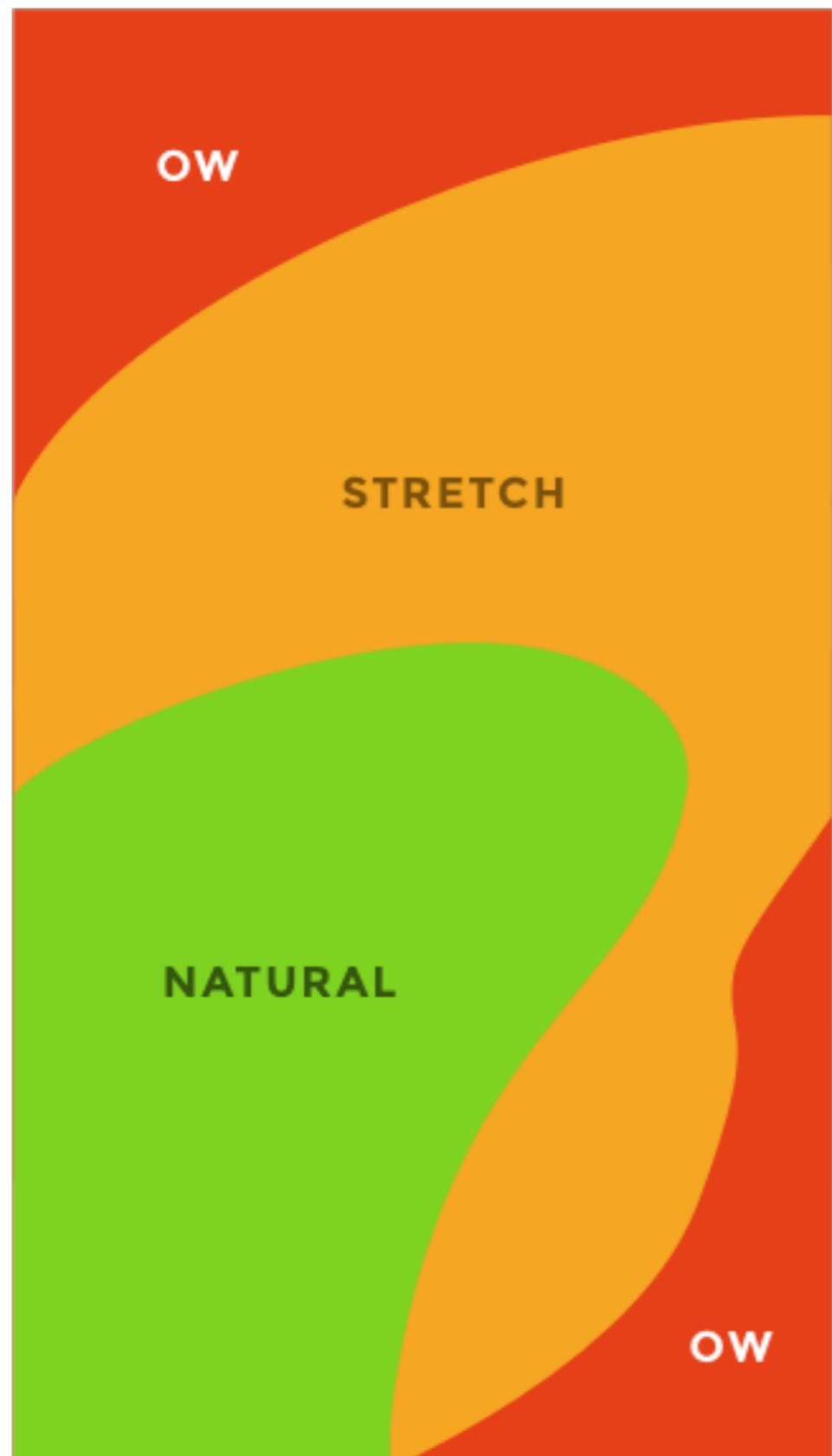


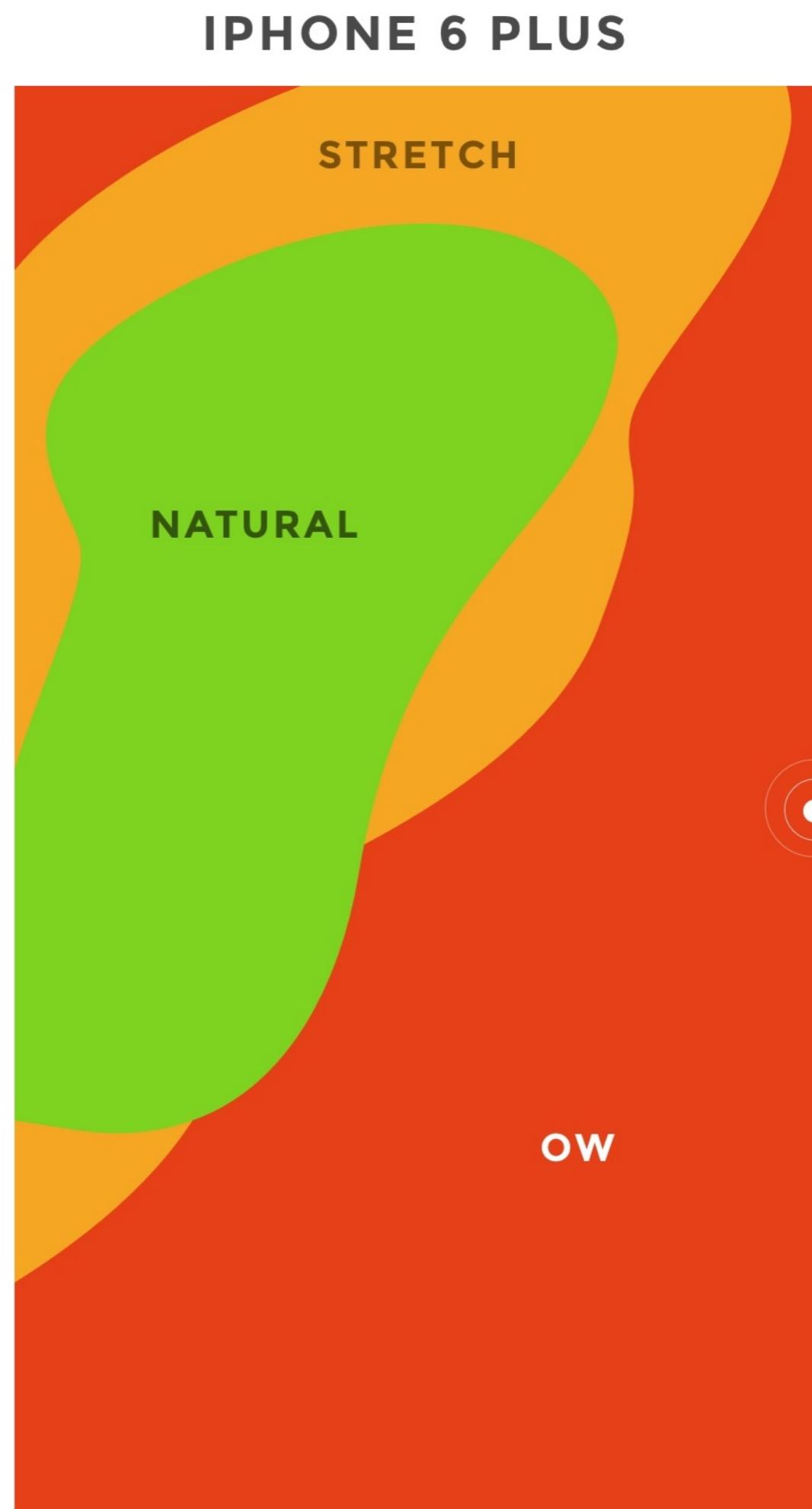
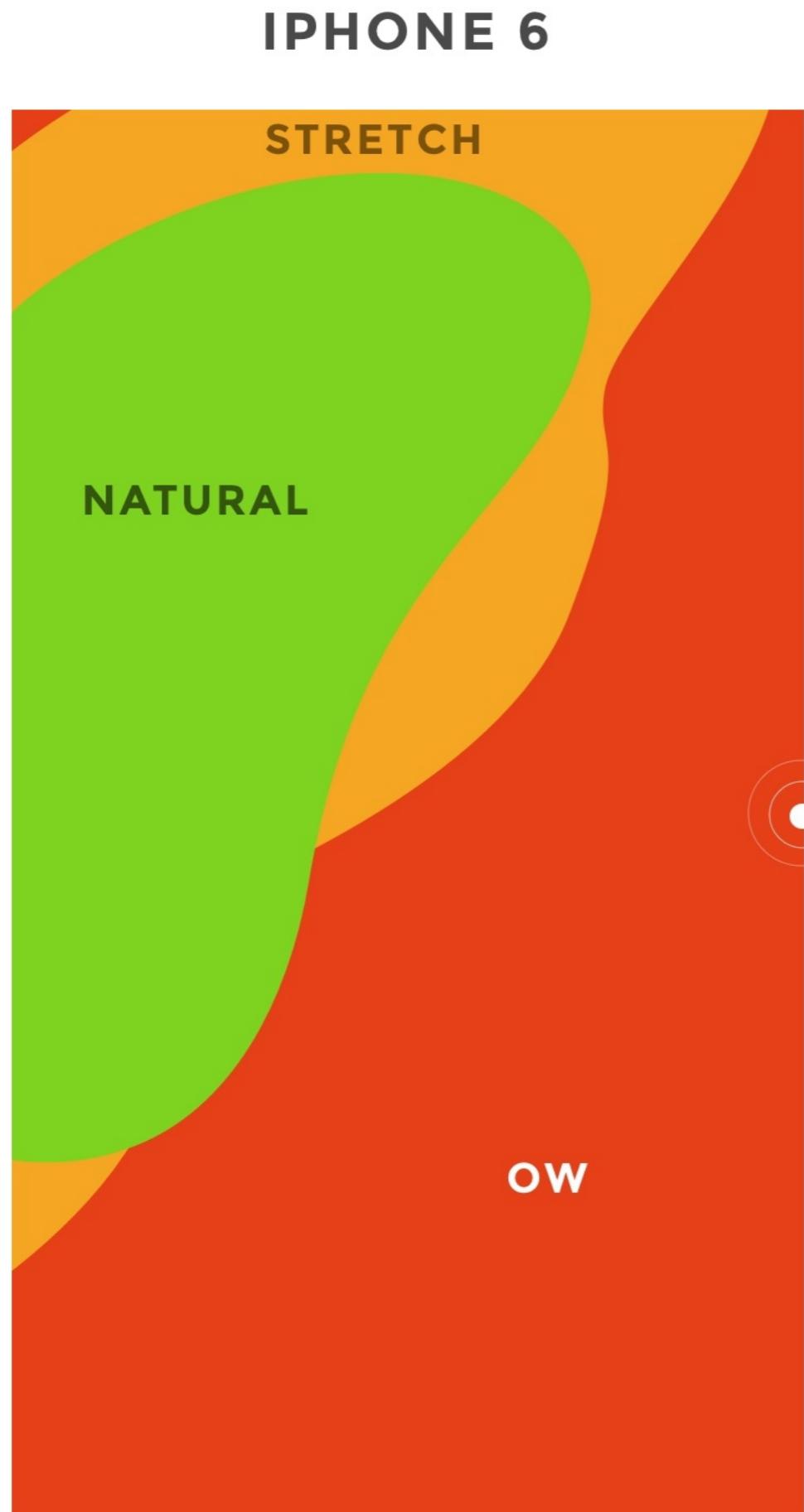


<https://www.youtube.com/watch?v=r3CTKI6pRIQ>



[https://www.youtube.com/watch?  
time\\_continue=1&v=O99m7lebirE](https://www.youtube.com/watch?time_continue=1&v=O99m7lebirE)







**The iPhone X doesn't have a home button, which means some widely used features will be eliminated.** Justin Sullivan/Getty

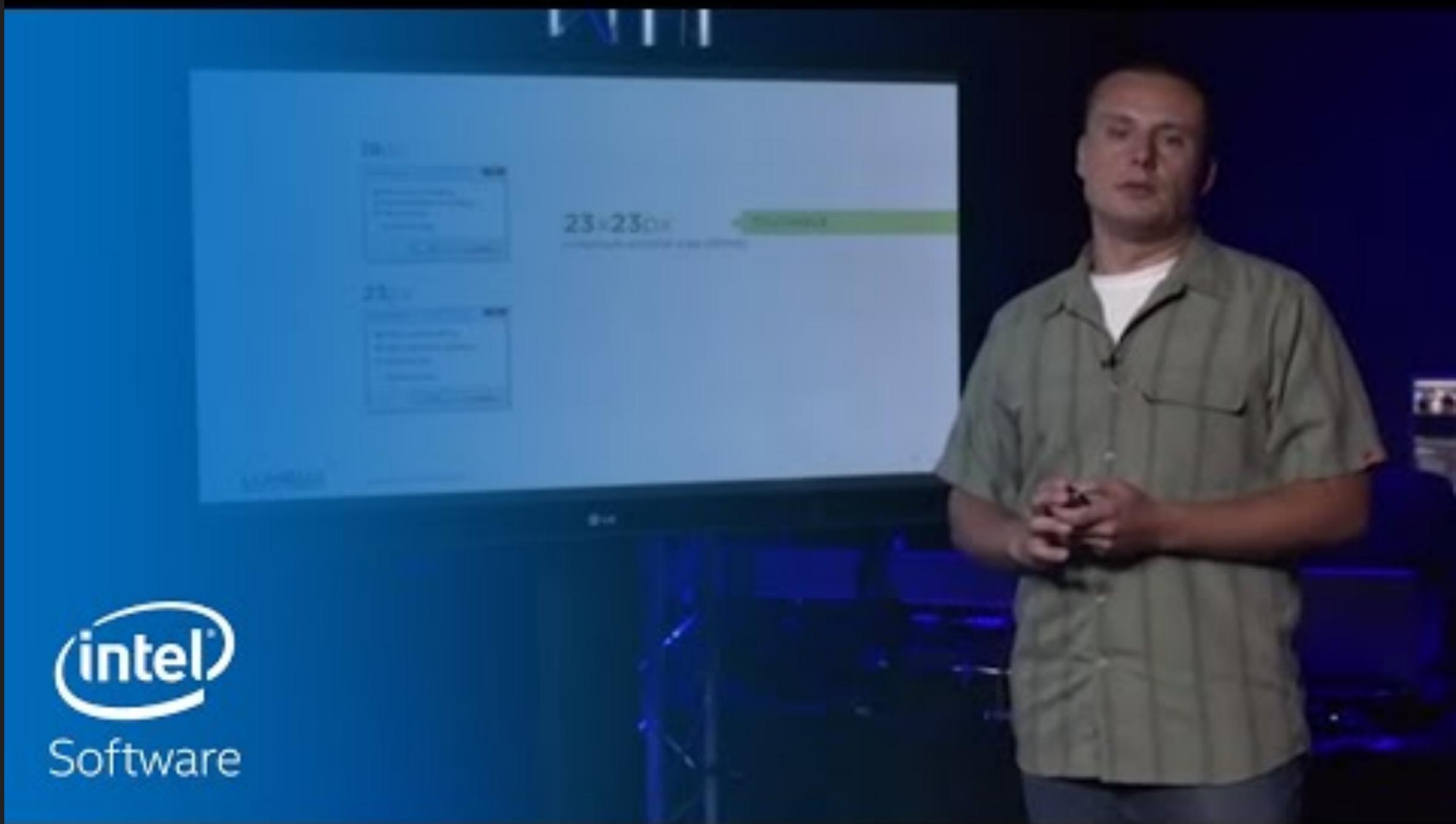
# Activity: Small Screen Navigation Case Study

Let's take a look at a website's level of 'thumb friendliness' on a mobile device...









<https://www.youtube.com/watch?v=jm16qmCXmoY>

# Essential Touch Interaction Design Guidelines

- Touch Target Size
- Placement of Controls
- Behavior (i.e. no hovers)
- User Effort
- Gestures (i.e. standard and non-standard)

# Activity: Touch Interaction Analysis

INDIVIDUAL, TEAM, OR PROJECT GROUP

## One-Page Touch Interaction Design Checklist

Assess touch interaction of SFU's myExperience Web app

# **HTML**



iPod 19.13

Search (search)

Telephone (tel)

URL (url)

Previous Next AutoFill Done

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| 4<br>GHI  | 5<br>JKL | 6<br>MNO  |
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URL (url)

E-mail (email)

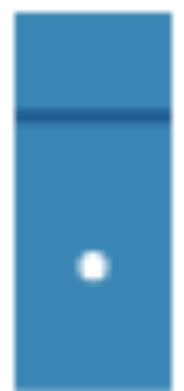
Date and Time (datetime)

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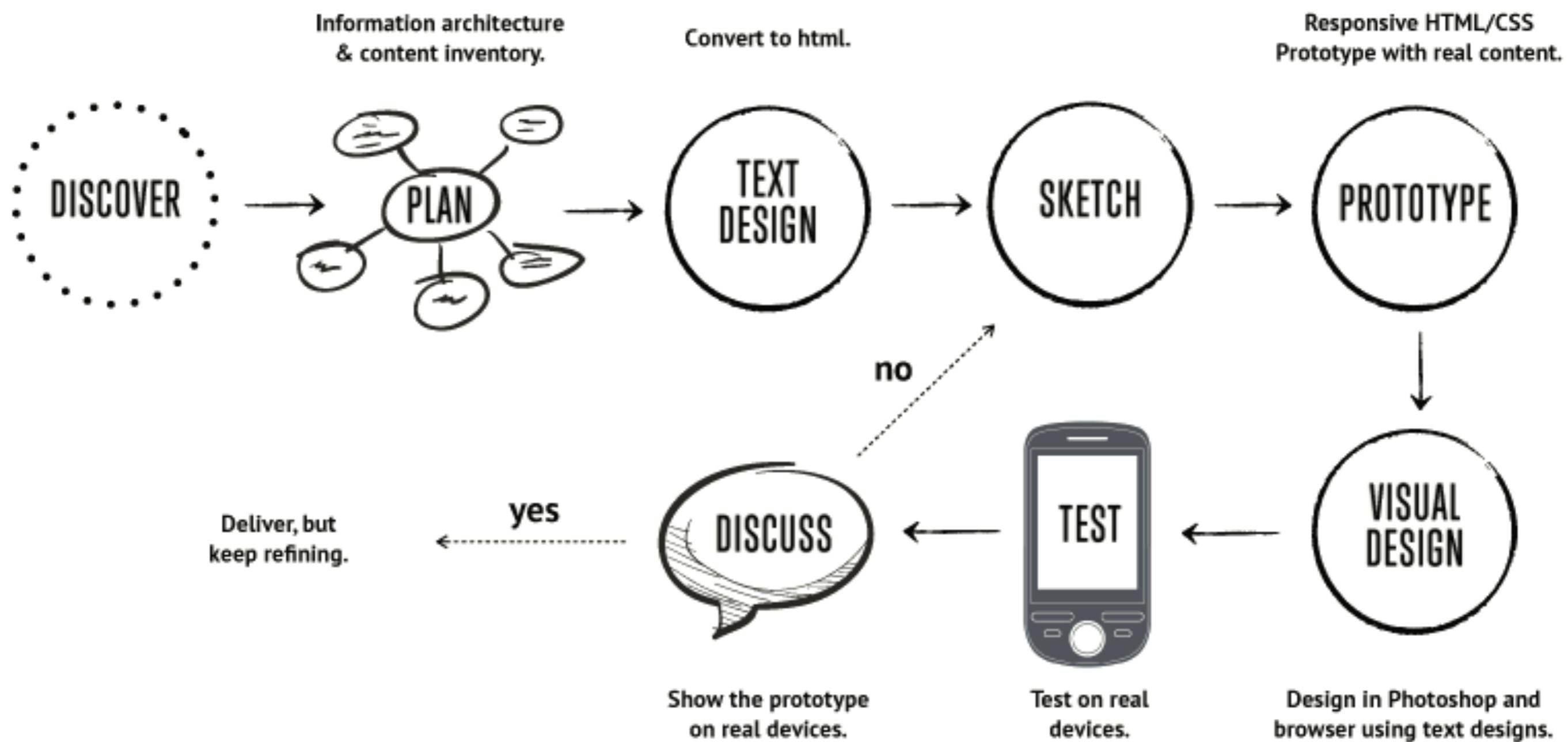
# Mobile and Multi-device Design

Responsive Web Design (RWD)



# Responsive Web Design (RWD)

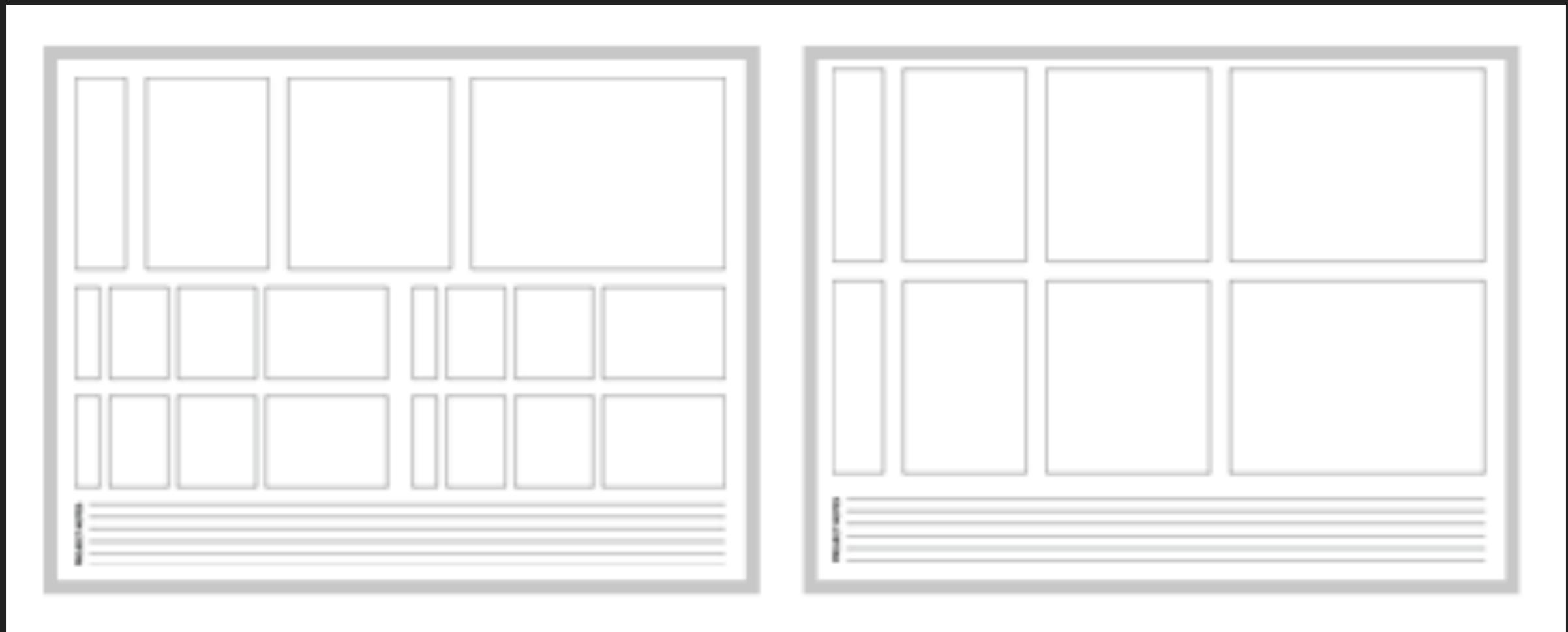
- Content/interface universal for all devices
- One source of content, presented differently
- Key elements
  - CSS media queries
  - Fluid grid layouts
  - Flexible images and media



# My RWD Design Process

- Discover (always lots to learn...)
- List and prioritize the content (nothing fancy)
- Development
  - Sketch (content placeholders, mostly for breakpoints)
  - Wireframe (a teeny bit really, sometimes none)
  - Visual Design (rough layout colour comps, maybe)
  - Prototype (a whole lot, and then some more!)
  - Test (rinse and repeat as needed)
- Deliver

# Responsive Web Design Sketch Sheets



<http://jeremypalford.com/arch-journal/responsive-web-design-sketch-sheets/>

# Content Inventories

- A standard IA technique - even more essential for RWD
- Inventory a first step, but prioritization is the key
- Plays a key role when deciding upon RWD breakpoints

# Typical Content Inventory Structure

- Content
- Type
- Location
- Meta-data
- Owner
- Last updated
- Comments

# RWD Content Inventory Adjustments

- Content
- Priority
- Type
- Size (*characters, image dpi/dimensions, etc.*)
- Location
- Meta-data
- Content owner
- Last updated
- Comments

# Activity: Content Inventory

INDIVIDUAL, TEAM, OR PROJECT GROUP

Review SFU's myExperience Web app and start to create a content inventory to estimate considered priority per placement

Content

Type

Size

Location

*Indicated Priority*

# Prototyping Using a HTML Framework

- Generate smartphone, tablet, and desktop mockups
- Single source of content for all device presentations
- Supports a fast, highly iterative, design-feedback loop
- Focus first on creating the right thing, then focus on right look
- May be possible to seamlessly move from prototype to website
- Use a Responsive HTML Framework for Prototyping

# Use a Responsive HTML Framework for Prototyping

- Twitter Bootstrap
- Zurb Foundation
- Material Design Lite (Google)

# Twitter Bootstrap HTML Examples

## Two Column Grid

```
<div class="row">
  <div class="span9">...</div>
  <div class="span3">...</div>
</div>
```

## Information Alert Box

```
<div class="alert alert-info"> ... </
div>
```

# Twitter Bootstrap Resources

- Twitter Bootstrap
  - <http://getbootstrap.com/>
- Pingendo - The ultimate Bootstrap 4 builder
  - <https://pingendo.com/>
- Twitter Bootstrap Tutorials
  - <https://www.lynda.com/Bootstrap-training-tutorials/1421-0.html>

Caveat: Standalone HTML  
Prototypes May Hinder  
Collaborative Design



<https://www.youtube.com/watch?v=VPzsMdqZKFE>

# Summary

- “Mobile” Design
- Touch Interaction Design
- Responsive Web Design (RWD)

# References and Suggested Books

- Designing for Touch by Josh Clark

# Image Credits

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