Mobile Technologies

Mobile Design

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Designing an App

• 4 Steps:
  1. App Idea
  2. Users Profile
  3. App Definition Statement
     • Include 3-5 key features
  4. UI Design
     • Paper prototyping
     • Wireframing
     • Prototypes
Idea

- Find a need and fill it!
- Brainstorm!
- Do you have an idea for an app?
- What app would make your life easier?
- Is there a problem that could be helped with an app?
- Have you been tasked to design an app?
Pick an Idea (or 2)

- Apps for social good: http://tech.co/mobile-future-social-good-apps-2016-02
Features of the App

- Consider all of the features our users might want
- Make a comprehensive list
Facebook

- Create an account
- Add friends
- Display a news feed based on your friends
- Like a post
- Comment on a post
- Share updates, photos, and videos
- Tag friends in photos
- Be notified when friends like and comment on your posts
- Be notified when friends post to your timeline
- Be notified when you are tagged in a photo
- Search for a friend
- Unfollow a friend
User Profile

• This is our target audience

• **Users** are the most important consideration

• Ask many questions
  – Who are they? What do they want? What is their age range? Where and when would they be using the app?

• Look at any competitors
  – What do users want that they aren’t getting?
  – What makes ours better?
Facebook Demographics

Facebook Usage Among Key Demographics

**Gender**
- 66% Men
- 77% Women

**Age**
- 18-29: 87%
- 30-49: 73%
- 50-64: 63%
- 65+: 56%

**Location**
- 71% Urban
- 72% Suburban
- 69% Rural

**Income**
- > $75K: 72%
- $50K-$75K: 74%
- $30K-$49K: 69%
- < $30K: 77%

**Education**
- College Graduate: 74%
- Some College: 71%
- High School Or Less: 70%

http://www.pewinternet.org/files/2015/01/PI_SocialMediaUpdate20144.pdf
Facebook Demographics

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<tr>
<th>Countries</th>
<th>Selected Audience</th>
<th>Compare</th>
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<td>France</td>
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Facebook

• Assumptions about users
  – Access to mobile devices & laptops
  – Willing to share information
  – Interested in keeping up-to-date with their friends
  – Are more likely to be female than male

• Our typical user is
App Definition Statement

• Mission statement of our app
  – Concrete declaration of an app’s main purpose and its intended audience

• Pare down our feature set to the most essential elements
  – Core feature set
  – Filter the feature list through the audience definition

• Minimum viable product

• Write out your app definition statement
  – Refer to this during the design and development cycles
App Definition Statement

• Apple’s iOS Developer Library

• Example
Examples

• **Vampire Rancher** is a vampire themed farming simulator, where the blood glucose readings of patients with diabetes directly affect in-game resources, helping patients to learn healthy habits as they build a productive vampire farm through healthy readings.

• **PAM+** is a mobile app for the iPhone that serves as a complement to Pacesetter’s existing Patient Advisory Module (PAM) and helps PAM patients manage and improve their health.
Facebook

• Core features
  – See what friends are up to
  – Share updates, photos, and videos
  – Get notified when friends like and comment on your posts

• App definition statement
  – An app that allows you to quickly keep up-to-date with your friends. Like and comment on your friends' posts. Share your updates, photos, and videos.
Apps on Apple App Store

Description
Keeping up with friends is faster than ever.
- See what friends are up to
- Share updates, photos and video
- Get notified when friends like and comment on your posts
- Watch and interact with live video
- Play games and use your favorite apps

Read our Data Use Policy, Terms and other important info in the legal section of our App Store description.

Description
See what’s happening in the world right now. From breaking news and entertainment, sports and politics, to big events and everyday interests. If it’s happening anywhere, it’s happening on Twitter. Get the full story as it unfolds, with all the live commentary.

Be part of what everyone is talking about and get videos, live footage and Moments, direct from the source.

Join in on all the action by sharing what’s happening in your world. On Twitter you can post photos with stickers, GIFs, videos, and even stream live video with the Periscope button. There is no better way to have your voice heard.
Design the UI

• Design the app for the device
• Tailor customization to the task
  – Always have a reason for customization
  – As much as possible, avoid increasing the user’s cognitive burden
  – Be internally consistent
  – Always defer to the content
  – Think twice before you redesign a standard control
  – Be sure to thoroughly user-test custom UI elements
Design the UI

• Paper Prototypes
  – Sketches can provide a sense of the user experience as a whole
    • Allowing us to spot potential usability problems before we commit too much time to building the interface
  – Grab a pencil

• Wireframing
  – Low-fidelity visual representation of the layout of our application
    • Basic page layout and navigational model

• Prototype a range of approaches
  – Testing our interface ideas – can reject

• [http://bcf.usc.edu/~trinagre/itp140/Prototyping.html](http://bcf.usc.edu/~trinagre/itp140/Prototyping.html)
Design & Communication

• Design starts with communication
• Design is the process of organizing the information we want to present
  – Structure is meaningful
  – Instantly understandable
• Control the navigation and flow of our app
  – Clear, minimizes uncertainty, & feels efficient
• Jeffrey Zeldman, father of standards-based design, says in his article “Style versus design”:
  – Design communicates on every level. It tells you where you are, cues you to what you can do, and facilitates the doing.
Crafting an Interface

• Craft an interface that is functional
• Aiming to create an experience or rather getting out of the way and letting our users create their own experience
• The interface is the medium through which we enable it to happen
• Deliver the most appropriate content and experience to our users
  – Crucial for mobile is the context (when & where) in which they’ll be using that info
Context

• How, where, & when our users use their mobile devices

• Need to work harder than ever to maintain their attention!
Designing for Touch

• Mobile devices rely on touch as their interface with the users.
• With touch, experience is now tactile, hence more intuitive.
• On a laptop, use a touchpad or mouse which displays a mouse pointer on the screen.
• Our fingers don’t have the same level of precision of a mouse.
Designing for Touch

• Users hold and touch their devices in various ways.
Touch

- On a mobile device, a user touches the screen with their thumbs and fingers (usually index or points fingers).
- According to Wikipedia, the average width of the adult thumb is 25 mm (1 inch) which equates to 72 pixels.
- According to a study by the research team at the MIT Touch Lab, the average width of the pointer finger as being 16 – 20 mm for adults which equates to a range between 45 – 57 pixels.
Size of Touch

72 Pixel Touch Target
Thumb fits snugly inside. Target edges give visual feedback. Thumb pad is used instead of thumb tip.

57 Pixel Touch Target
Index finger fits snugly inside. Target edges give visual feedback. Finger pad is used instead of fingertip.
Size of Touch

• In general, the smaller a touch target, the higher the risk of unintended results, poor quality of experience and excessive cognitive loading or user confusion.

• Research by Microsoft showed people are able to tap the target faster if the touch target is big enough.

• If the users’ fingers overlap neighboring elements, unintended outcomes become more likely.
Josh Clark’s aptly named **rule of thumb** uses the thumb’s radius of reach as a guideline for design.

When holding a smartphone, the thumb generally operates in the lower left half of screen (for right handedness), which is why many of the primary controls are often organized into this bottom area of the screen.
Mobile Recommendations

• Apple’s iPhone Human Interface Guidelines recommends a minimum target size of 44 pixels wide and 44 pixels tall.

• Microsoft’s Windows Phone UI Design and Interaction Guide suggests a touch target size of 34px with a minimum touch target size of 26px.

• Nokia’s developer guidelines suggest that the target size should be no smaller than 1cm x 1cm square or 28 x 28 pixels.
tiny buttons make Hulk go mad
Touch

• The act of trying to touch an interface element obscures that element from our view
• Delicate balance between trying to fit as much info as possible into smaller physical space and offering targets big enough for fingers
• Need simple interfaces
  – Easy to understand → easy to use
Hover Me

• Hovering as an interaction model permeates the Web
• In lieu of a hover state, consider:
  – Making buttons and hyperlinks obvious
  – Having content that doesn’t rely on using hover
  – Avoiding drop-down menus without clear visual cues
Small Screens

• Mobile devices have displays that are significantly smaller
  – Both in terms of physical size & resolution
• Reduce clutter
• Make an interface information-rich
• Don’t make them drill down too much
Laws of UX

- [https://lawsofux.com](https://lawsofux.com)
1. Fitts’s Law
2. Hick’s Law
3. Jakob’s Law
4. Law of Prägnanz
5. Law of Proximity
6. Miller’s Law
7. Parkinson’s Law
8. Serial Position Effect
9. Tesler’s Law
10. Von Restorff Effect
11. Zeigarnik Effect
Cognitive Load

• Fitts’s Law
  – The time to acquire a target is a function of the distance to and the size of the target
  – Simply put, the larger an item is and the closer it is to your cursor, the easier it is to click on

• Origin of finger movements is simply the default position of fingers or thumbs
  – Varies on device and its orientation
8 Golden Rules of Interface Design

• by Ben Schneiderman
• http://www.cs.umd.edu/~ben/goldenrules.html

1. Strive for consistency
2. Cater to universal usability
3. Offer informative feedback
4. Design dialogs to yield closure
5. Prevent errors
6. Permit easy reversal
7. Support internal locus of control
8. Reduce short-term memory load
Resources

• http://4ourth.com/Touch/
• https://www.smashingmagazine.com/2012/02/finger-friendly-design-ideal-mobile-touchscreen-target-sizes/
• http://mobiforge.com/designing/story/designing-touch-thumb-and-finger-sized-design