Mobile Computing & Mobile UI Design

Prof. James A. Landay
Computer Science Department
Stanford University

Winter 2016
January 24, 2017

* Some slides based on slides of Prof. Scott Klemmer, UCSD

Outline

1. History of Miniaturization & Mobility
2. Palm Pilot
3. iPhone
4. Mobile UI Design

• Weight Watchers app
• What app am I in?
• Icon mappings?
• Menu non-standard
• No overview+detail
• How do I do “My Friends” w/o Log In?

In 1954 Harold S. Osborne, the recently retired chief engineer for AT&T, made the following prediction (quoted in Costly 1954, p. 86):

Let’s say that in the ultimate, whenever a baby is born anywhere in the world he [sic] is given at birth a number that will be his telephone number for life. As soon as he can talk, he is given a watchlike device with 10 little buttons on one side and a screen on the other (see Figure 6.1). Thus equipped, at any time when he wishes to talk with anyone in the world, he will pull out the device and punch on the keys the number of his friend. Then, turning the device over, he will hear the voice of his friend and see his face on the screen, in color and in three dimensions. If he does not see him and hear him, he will know that the friend is dead.
Sony Walkman (1979)

Sanyo MG30 (1982-83)

Car Phone (1980s-90s)

7.4 billion Mobile Phones Worldwide (2016)

Mobile Took 14 years to Go Mainstream

Data courtesy ITU (International Telecommunication Union), 2016

Mobile Broadband Subscriptions
per 100 inhabitants
Developed 90%
Developing 41%
World 49%
Mobile Design Evolving Rapidly!

Apple Watch (2015)

There was the Newton … (1993)

Apple Newton

The Newton OS GUI

Photograph of screen displaying a checklist with some bullet points checked and/or "collapsed"

Newton screen displaying a checklist, a world, & various icons and menus.

The Newton Had Problems…

- Physical size: too big
- Connectivity: not much
- Recognition: relied on it too much, didn't work well enough

Design Issues

"Hey, take a memo on your Newton!"

"Beat Up Martin"

"Shut Up Mark!

The Original Apple Newton’s handwriting recognition was made light of in The Simpsons episode Lisa on Ice

Source: The Simpsons, Wikipedia

The Palm Pilot Improved…

- Design Wins
- Physical size: fits in the front pocket
- Connectivity: easy sync
- Recognition: simple graffiti single stroke

Rob Haitani, Palm

Jeff Hawkins, Palm

"Checklist"

"HotSync"

"Graffiti"

"Palm OS"

Palm Pilot Prototypes

http://www.computerhistory.org/collections/accession/102716262

Prototyping the Palm hardware, form factor, software
Technology Trends

Technology Trends

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- Imaging Resolution
- Display Resolution
- Size of pockets
- Unaided human abilities

Why Mobile First?

- Market size & changing demographics!
  - many people do not have internet access beyond their mobile phone
- Constraints force focus on most important features/tasks of customers
What Makes Mobile Design Exciting?

Many Design Choices
• Think different from GUI/Web
• Swiss army vs. dedicated
• Pen/speech/touch/gesture/vision modalities
• Integrate with other real-world tasks
• Social apps

Always in your pocket* or w/ you!

*often not true for women

What Makes Mobile Design Difficult?

Design constraints
• Limited attention/Interactions bursty
  – sometimes not true (people increasingly use phones stationary sometimes for long times)
• Screen size small (size not resolution)
• Form factor / input devices
• Limited network connectivity
• Speech / pen / multimodal

Limited Attention & Input Interaction

• Minimize keystrokes
• Provide overview + detail
• Understandable interface at a glance
• Design with tasks
• Minimum set of functions

Mobile Design Constraints …

Design constraints
• limited attention/interactions bursty (sometimes untrue)
• form factor/screen size small (independent of resolution)
• natural (ambiguous) input modalities

Leverage Context

Mobile usage context
• mobile device with user & on
  use gives clues to context…
  – apps give cues (e.g., calendar or job schedule)
  – location gives cues
  – activity inference (e.g., adapt to walking)

Design for Limited Attention

• Minimize keystrokes
• Understandable at a glance
  – overview + detail
• Task-oriented w/ minimum set of functions
Initial Impressions Matter

- If people don’t “get it”, they won’t download or they’ll quit after quick look
  - need to have clear “value proposition” in both app store title, blurb, & app design

Let the Content Shine

- Immersive applications focus on content
  - “The idea is that the content is the interface, the information is the interface — not computer administrative debris.”
    - Edward Tufte

Personalize User Experience

- Name
  - use it if known & integral

- Settings
  - common ones in app
  - not a dumping ground for extra features

- Favorites/Bookmarks
  - save item for viewing later (sync across platforms)

- Behavior
  - access based on app history (e.g., recent searches)

Make Selections Fast & Error Free

- Provide smart defaults
- Suggest matches during text entry
- Store recent activity / selections

Provide Appropriate Feedback

- Animations
  - Downloading, moving, end of content...
- Transitions
  - when users move between related screens
    - e.g., flip (settings/views), slide left/right (lists), slide up/down (secondary panel), fade in/out, curl (e.g., maps)
- Text alerts
  - If visual not enough (inline or overlay-modal)
- Sound
  - use sparingly as can be annoying
“Good Artists Borrow, Great Artists Steal”
– Pablo Picasso (?)

• What apps do you like?

• Why?

• Borrow good features/styles