Early Stage (lo-fi & med-fi) Prototyping

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Computer Science Department
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Winter 2022
January 26, 2022
Interface Hall of Fame or Shame?

Dyson AirBlade hand dryer example courtesy of Maya I.
Interface Hall of Fame or Shame?

Good
- shape indicates function
- so simple that instructions fit in 1 image
- fun!

Bad
- dripping water?
- too much noise
- still takes too long

Dyson AirBlade hand dryer
text courtesy of Maya I.
Interface Hall of Fame!

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Dyson AirBlade hand dryer
example courtesy of Maya I.
Can We Do Better?

Good
- Integrate hand dryer into sinks…
300 m
TURN RIGHT ONTO DRAAIWEG

TURN LEFT ONTO NOLENSLAAN

Winter 2022
dt+UX: Design Thinking for User Experience Design, Prototyping & Evaluation

iOS 6 Maps
By Apple Inc.
Hall of Shame!

Good
- beautiful alternative to the competition & generally easier to read
- turn by turn directions are efficient, clear & functions well – in general

Bad
- despite any aesthetics, the data is wrong & sparse, meaning, it does not perform the one task it should do well
  - getting from A to B

iOS 6 Maps
By Apple Inc.
Hall of Shame!

Google Maps Data vs iOS6 Maps Data
Hall of Shame!

A clear example of where no matter how good a design may be, without its most important function, in this case **correct data**, the interface is useless.

iOS 6 Maps
By Apple Inc.
Hall of Shame!

Google Maps Data vs iOS14 Maps Data – much closer in quality
Early Stage (lo-fi & med-fi) Prototyping

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Outline

- Sketching vs. Storyboarding
- Prototyping
- Low-fi prototyping
- Conducting a low-fi test
- Medium-fi prototyping
Sketches & Storyboards

- Where do storyboards come from?
  - film & animation
- Give you a “script” of important events
  - leave out the details
  - concentrate on the important interactions
DESCRIPTION: EXT. FOREST - MS LUKE & LEIA - TRUCKING
Sketches & Storyboards in UX Design

[Image of sketches and storyboards]

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Winter 2022

dt+UX: Design Thinking for User Experience Design, Prototyping & Evaluation

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[Handwritten notes and diagrams related to sketches and storyboards in UX design]
Sketches & Storyboards in UX Design

[Diagram showing a sketch of a user interface with a list of items labeled 'Current Drug Plan' and a note 'Administering prescription drug here.']

William Du
Starts to tell a story, but still describes the design
Sketches & Storyboards in UX Design

Task Flow #1

[Diagrams and sketches of user interfaces and designs]
What is a Prototype?

“A prototype is an early sample or model built to test a concept or process or to act as a thing to be replicated or learned from.”

– Wikipedia

CS147 definition: a working representation of a final artifact

http://www.computerhistory.org/collections/accession/10271692/
Types of Prototypes

Prototypes are concrete representations of a design

Prototype dimensions

- representation: form of the prototype
  - off-line (paper) or on-line (software)
- precision: level of detail (e.g., informal or polished)
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- precision: level of detail (e.g., informal or polished)
- interactivity: watch-only to fully interactive
  - fixed prototype (video clips)
  - fixed-path prototype (each step triggered by specified actions)
    - at extreme could be 1 path or possibly more open
  - open prototype (real, but limited error handling or performance)
- evolution: expected life cycle of prototype
  - e.g., throw away or iterative
Fidelity in Prototyping

• Fidelity refers to the level of detail
• High fidelity?
  – prototypes look like the final product
• Low fidelity?
  – artists renditions with many details missing
What do we like about this prototype?

What do wish could be improved?
What do we like about this prototype?

What do wish could be improved?
The feedback you get is different

Low-fi

Medium-fi
2-minute break
Hi-fi Prototypes Warp

- Perceptions of the tester/reviewer
  - representation communicates “finished”
    - comments focus on color, fonts, & alignment
- Time
  - encourage precision
    - specifying details takes more time
- Creativity
  - lose track of the big picture
Why Use Low-fi Prototypes?

• Traditional methods take too long
  – sketches → **prototype** → evaluate → iterate

• Can instead simulate the prototype
  – sketches → evaluate → iterate
  – sketches act as prototypes
    • designer “plays computer”; others observe & record

• Kindergarten building skills
  – allows non-programmers to participate
“Prototyping for Tiny Fingers” by Rettig
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Check out our non-hassle Return Policy

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<td>Total</td>
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</tbody>
</table>

Continue Shopping | Checkout
Cookable
Cookable

Salad

Favorites

Trending
Cookable
Caesar Salad

- 2 cloves garlic, finely chopped
- 3 anchovy fillets
- ½ lemon, juiced
- 2 teaspoons red wine vinegar
- 1 teaspoon Dijon mustard
- 1 egg yolk
- 1 ½ tablespoons Worcestershire sauce
- ½ cup olive oil
- 1 pinch salt and ground black pepper
- ½ head romaine lettuce, chopped
- 1 ½ cup grated Parmesan cheese
- 2 tablespoons croutons

Order - Cook
Caesar Salad

2 cloves garlic, finely chopped
2 anchovy fillets
1/2 lemon juiced
2 tablespoons red wine vinegar
1 tablespoon Dijon mustard
1 egg yolk
3 dashes Worcestershire sauce
1/4 teaspoon black pepper

1/2 cup olive oil
1/4 cup grated Parmesan cheese
2 tablespoons parsley

Order  Cook
Who is Zuki?
Administrivia

- Assignment #5 – Low-fi Prototype & Pilot Usability Test
  - 15-20 rough sketches of different design realizations
    - everyone on team contributes
    - use different modalities (e.g., visual, speech, watch) or different visual UIs input techniques (gestures, taps, etc.)
  - will start this in studio this week
Administrivia

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    • everyone on team contributes
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    • will start this in studio this week
  - pick top 2 realizations & storyboard/task flow more
  - pick best realization & add details to task flow
  - build low-fi prototype of the best & test it w/ at least 3 target (non-Stanford) participants

• Web site directories will be created for each team by this weekend
  - each team needs 1 person to fill out this form by Thursday night
    • https://bit.ly/147teaminfo
  - start to get sites up there this weekend!
    • should have all of your work –not graded until mid-point check-in & near end of quarter
  - TAs will send you your directory path/name on web.stanford.edu
Administrivia

How do you feel about returning to in-person instruction (n=120)? 1=“I’d rather wait”, 5=“I’m eager to return”
Grading on Assignment #2

POV, HMW, EP Assignment #2

A2 Group Presentation:  
- : 0% ✓ --: 0% ✓ --: 9% ✓ : 65% ✓ +: 24% ✓ ++:2%

A2 Individual Presentation:  
- : 0% ✓ --: 0% ✓ --: 0% ✓ : 9% ✓ +: 80% ✓ ++:11%
Administrivia: Video Hints

• Under 2 minutes (90 seconds better)

• Add credits at end
  - Team/project name
  - Your names (first name & last initial)
  - “CS 147 – Winter 2022”
  - Won’t count in your time limit
Administrivia

- Use handbrake to compress your video
  - It will take your video from 250MB-1GB down to ~50MB
TEAM MEETINGS
Constructing the Model

• Set a deadline
  - don’t think too long - *build it!*
• Draw a window frame on large paper
• Put different screen regions on cards
  - anything that moves, changes, appears/disappears
• Ready response for any user action
  - e.g., have those pop-up dialogs, etc. already made
• Use printer/scanner to make many versions
Tasks:
1. Open the EE app.
2. Register and log-in.
3. Remove the minutes tile from your home screen.
4. Place the "add $10 Top-up" tile to your home screen.
5. Re-arrange the tiles on your home screen.

User Notification, Input Field, Pressable Button.
Preparing for a Test

• Select your “customers”
  – understand background of intended users
  – use a screening questionnaire to get the people you need
  – don’t use friends or family
  – **start recruiting today**

• Prepare scenarios that are
  – typical of the product during actual use
  – make prototype support these (small, yet broad)

• Practice to avoid “bugs”
Conducting a Test

Four Roles

- Greeter – puts users at ease & gets data
- Facilitator – only team member who speaks
  - gives instructions & encourages thoughts, opinions
- Computer – knows application logic & controls it
  - always simulates the response, w/o explanation
- Observers – take notes & recommendations
Who is Zuki?
Practice: low-fi prototype testing

You will be in a 5 min. breakout room of 4-5 people to test the low-fi prototype of SPICE app!

One will play user, one will play facilitator, and 2-3 will play observers taking notes.

Share the critical incidents (both positive and negative events) from your test in Slack.
Practice: low-fi prototype testing

SPICE is designed to assist college students with cooking by providing simple tips, tasks, and community interactions.

- Simple task: Navigate the app to find a way to spice up your food
- Moderate task: Navigate the app to find a way to share your creation
- Complex task: Navigate the app to find a way to cook with a friend

Evaluating Results

- High level questions about your design
  - does it **address the problem** you want to solve?
  - is this the **right realization** of your solution?

- Sort & prioritize observations
  - what was important?
  - lots of problems in the same area?

- Make changes & iterate
  - even **iterate between tests**
Advantages of Low-fi Prototyping

• Takes only a few hours
  – no expensive equipment needed

• Can test multiple alternatives
  – fast iterations
  • number of iterations is tied to final quality

• Almost all interaction can be faked (Wizard of Oz)
Problems with Low-fi Prototypes

• “Computer” inherently buggy
• Slow compared to real app
  – timings not accurate
• Hard to implement some functionality
  – pulldowns, feedback, drag, viz ...
• Won’t look like final product
  – sometimes hard to recognize widgets
• End-users can’t use by themselves
  – not in context of user’s work environment
Interactive Lo-fi Tools

Balsamiq Mockups
http://balsamiq.com

POP
https://marvelapp.com/pop
Remote Testing of Low-fi Prototypes

1. Participant runs & records prototype (e.g., Balsamiq/POP) on their phone [hardest]
   - user records interaction by recording screen on iOS/Android
   - you record zoom meeting while participant speaks aloud
   - [link](https://uxdesign.cc/moderating-ux-research-with-zoom-1d4e89614277)

2. Participant runs zoom on their phone while you screen share prototype [moderate]
   - user taps on items & verbalizes aloud
   - you control prototype & record meeting
   - [link](https://uxdesign.cc/moderating-ux-research-with-zoom-1d4e89614277)

3. Participant hugs their laptop [easiest]
   - user runs your prototype (e.g., Balsamiq/POP) on their own phone
   - you record zoom meeting of their screen as captured by their laptop camera
   - [link](https://medium.com/@beparticular/were-still-hugging-our-laptops-8c7f22ed800e)
Fidelity in Prototyping:
Instagator
Fidelity in Prototyping
Task 1: Take a Destination Poll

My Trips
GOING
NYC New Years
Planning...
Paris, Easter

NEW TRIP
TRIP NAME:
DESTINATION:
DATES:

NEW TRIP
SELECT PEOPLE
SEARCH:
- Alex R
- Maria J
- Jonathan

My Trips
Cabo
6/12/19 - 6/18/19
Santa Fe, NM
7/1/19 - 7/7/19
Koh Samui, TH
5/1/19 - 5/10/19

My Trips
Cabo
6/12/19 - 6/18/19
Planning

New Trip
Destination:
Dates:
Cover Photo:
Description:
Save

Low-fi
Medium-fi
Summary

• Prototypes are a concrete representation of a design or final product

• Low-fi testing allows us to quickly iterate
  - get feedback from users & change right away
Further Reading

**Prototyping**

- **Books**

- **Articles**
  - “Prototyping for Tiny Fingers” by Marc Rettig, in Communications of the ACM, 1994
Next Time

- **Lecture**
  - Watch, Critique, & Vote on Concept Videos (CS 147 Film Festival)

- **Reading**
  - None


- **Project**
  - 15-20 sketches of 3-5 design realizations in studio…
  - Pick the top two & storyboard/task flow those
  - Pick the top 1 & build/test low-fi prototypes using 3 key tasks for next week’s studio presentation
    - Recruit representative participants **now!**