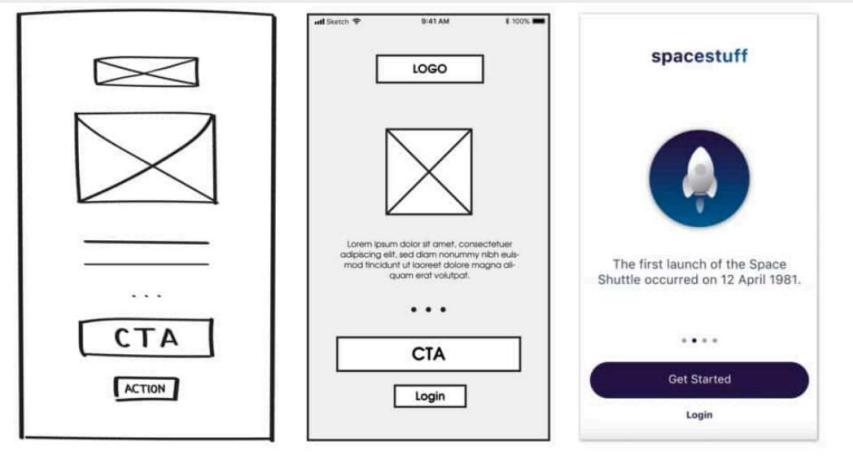


CSE 4451: HUMAN-COMPUTER INTERACTION

**Class 15: High-Fidelity Prototyping
& Summative Evaluations**

Hi-fidelity Prototype

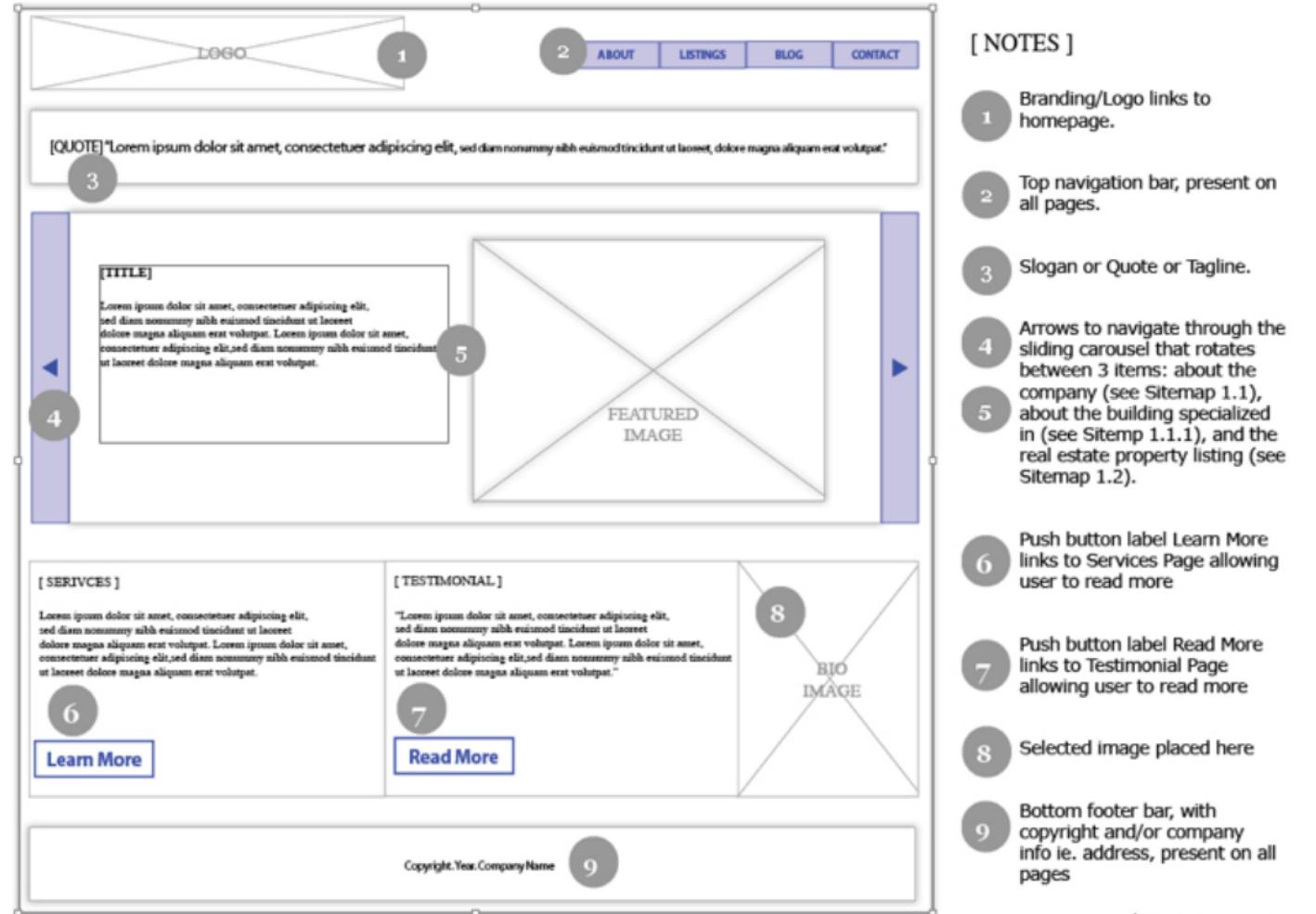
Prototypes that look like the final product



- Who is your audience?
 - Probably your design team
 - Maybe whoever is implementing your design
 - Possibly a potential user
- How will they be used?
 - In a design critique
 - As implementation guides

Wireframes

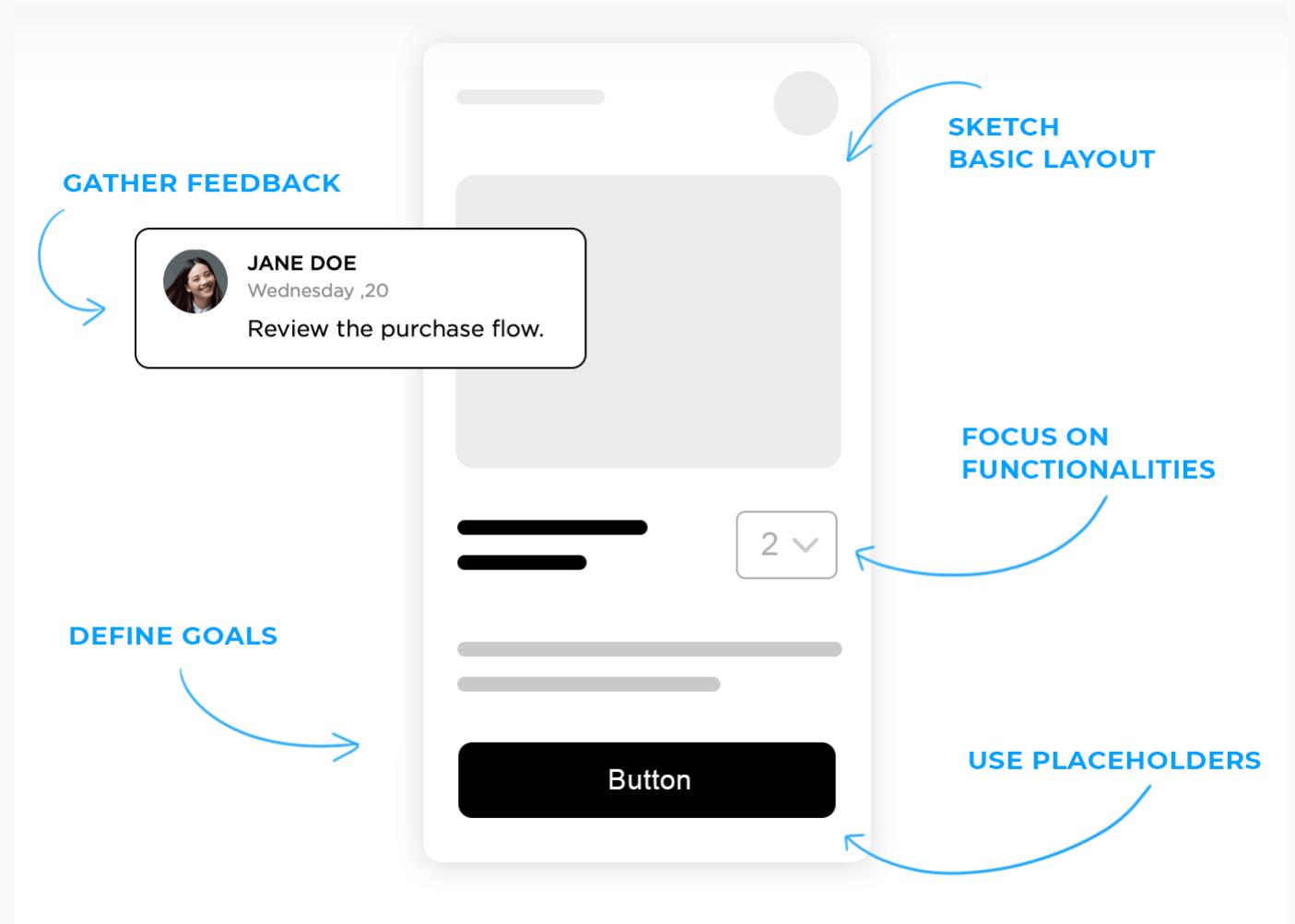
- Wireframes include layouts and key functional units
- They do not contain visual design details



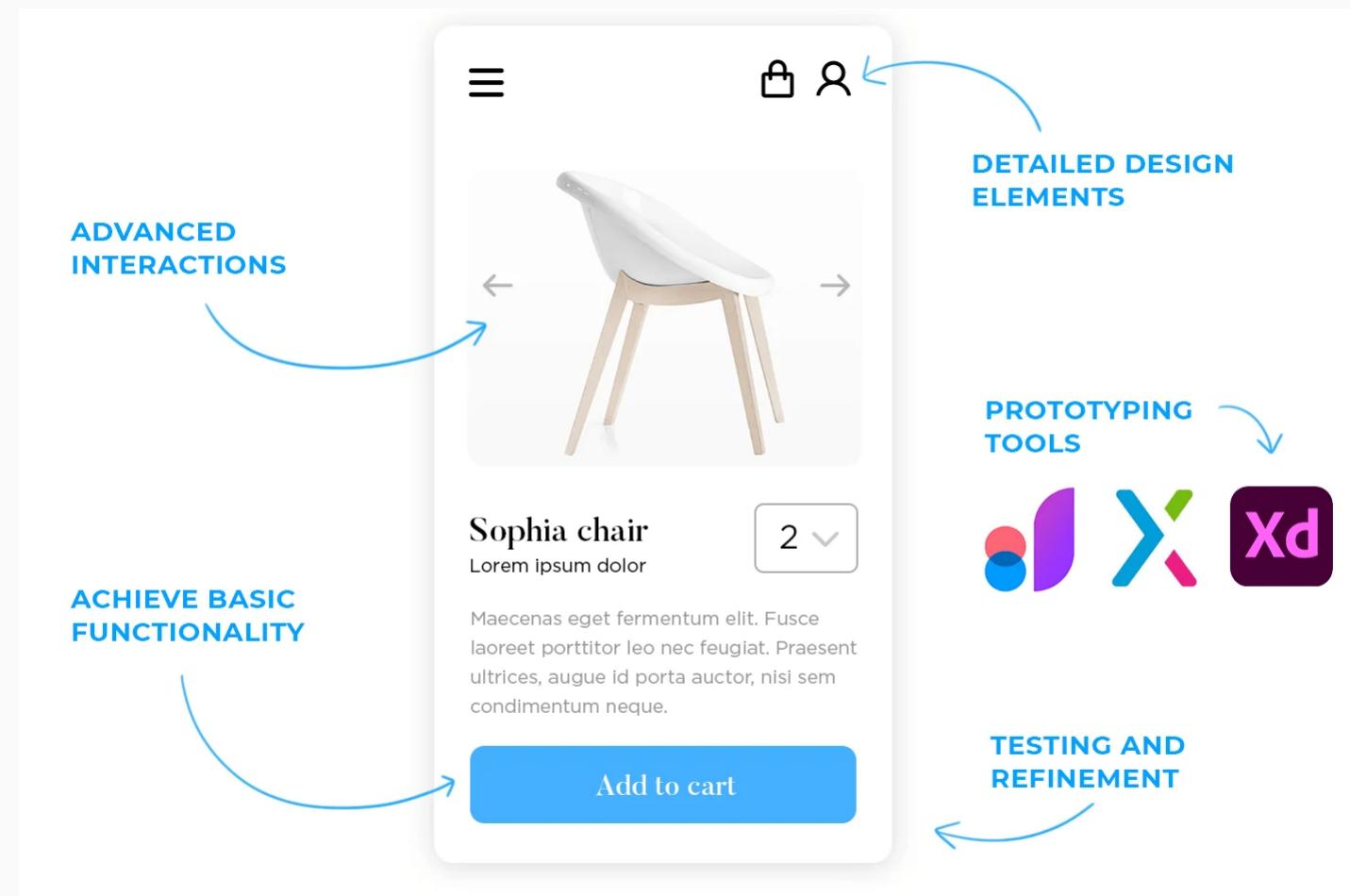
Lo-fi Wireframes

Use greeking

- Or text blocks
- Or placeholders instead of images



Hi-fi Wireframes



Low-fi vs High-fi Wireframes

The image illustrates the difference between low-fi and high-fi wireframes through two versions of a furniture website's homepage.

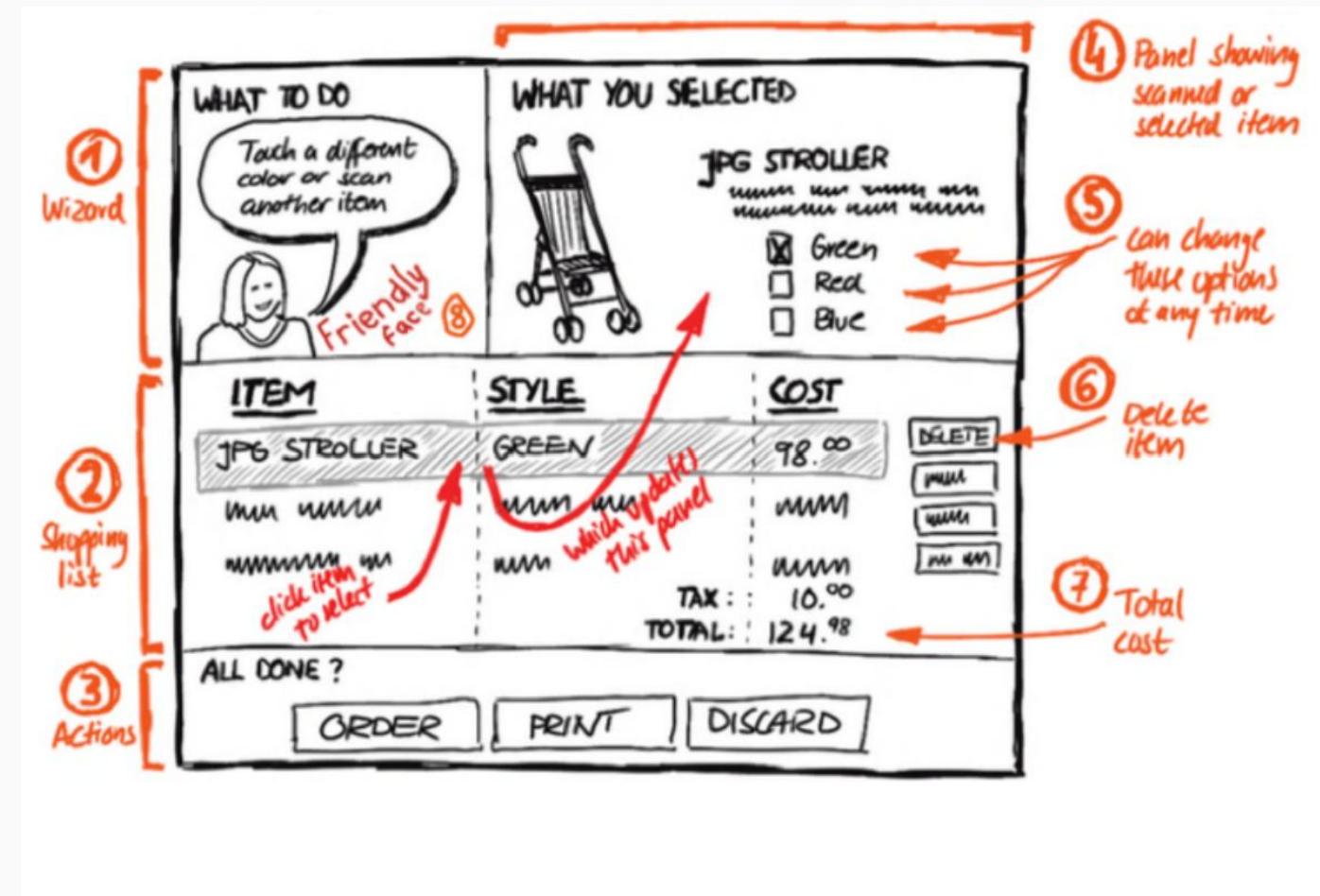
Left (Low-fi Wireframe): This version is minimalist and uses placeholder text ("Lorem ipsum dolor") throughout. It includes a header with a shopping bag icon and a search bar, a main content area with a large "X" mark, and a footer section featuring four small furniture icons.

Right (High-fi Wireframe): This version is more detailed and visually appealing. It features a header with "Home", "Collection", "Cart", and "Contact" links, along with a shopping bag icon and a search bar. The main content area has a teal header with the text "Furniture Home" and "Embrace Peaceful Oasis". Below this is a "Shop Now" button. The footer section is titled "What We Do" and contains a descriptive paragraph about the company's focus on crafting inspiring living spaces. It also includes a "Popular Collection" section displaying four furniture items: a round table, a pottery vase, a wooden sofa, and a black chair, each with its name and price.

A blue arrow points from the low-fi wireframe towards the high-fi wireframe, indicating the progression from a basic design concept to a fully fleshed-out user interface.

Hi-fi prototyping

- Annotate your wireframes
- Good annotations clearly indicate actionable items



Who are wireframe annotations for?

Key stakeholders who want a clear understanding of design decisions without a deep knowledge of user experience (UX) or user interface (UI).

Developers who want to see what they have to support, and how the site or application works (and doesn't work).

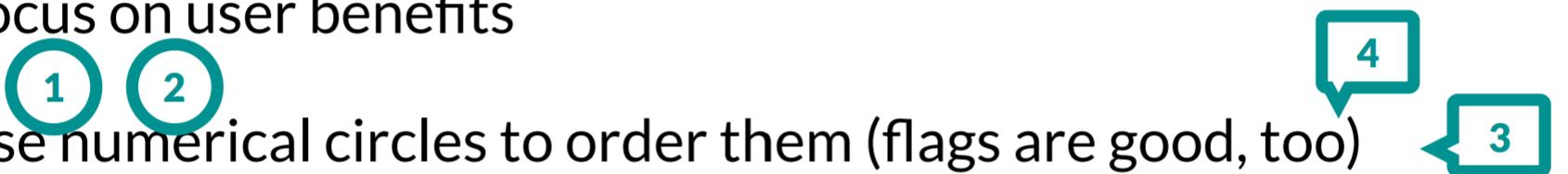
Visual designers who want to see what visual elements need to be on the page.

Copywriters who want to see what they need to write.

The future you who needs to remember why you made that form element a checkbox instead of a radio button.

Clients who want to see that you've incorporated the business goals they provided.

Annotation best practices

- Keep them short and to the point
 - “Automatically-generated photo from most recent blog post”
 - Focus on user benefits
 - Use numerical circles to order them (flags are good, too)
 - Locate explanations to the right of the wireframe
 - People will scan for annotation circles on the left, move to the right to read explanation
 - Use consistent terminology for objects
- 
- 1
 - 2
 - 3
 - 4

Annotation examples

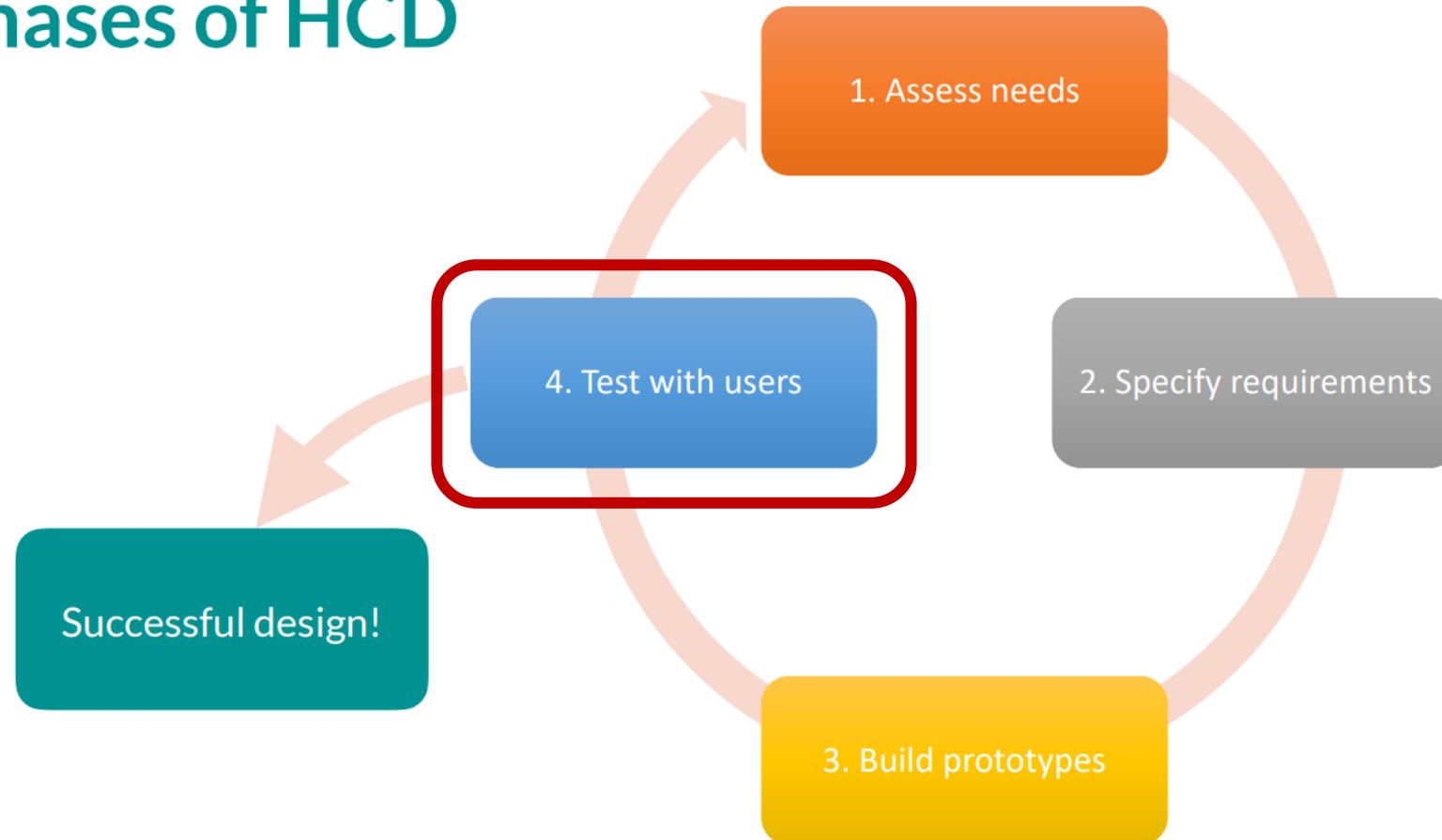
- “Triggering this call to action shall result in the display of the home page”
- “What the Events tab will look like when it’s selected by the user. It will have an icon and show the number of events.”
- “Name of the Event in bold. Below is a short description of the event.”
- “‘Attending’ flag that appears when a user RSVPs attending.”
- “To RSVP for an event, users have to click this button. It shows how many days until an event.”

Some Hi-fi tools

- Marvel
(<https://www.youtube.com/watch?v=1439vIj-yDk>)
- Balsamiq
(<https://www.youtube.com/watch?v=HebTVoOWMRs>)
- Adobe XD
(<https://www.youtube.com/watch?v=53qdI7CPNxM>)
- Sketch
(<https://www.youtube.com/watch?v=qywB0JHQeC4>)
- InVision
(<https://www.youtube.com/watch?v=v10t2azNaFs>)
- PowerPoint or Keynote...

Phases of HCD

Phases of HCD



Summative evaluation

- Why?
 - Feedback on design directions and ideas
 - Discover major issues
 - (Help to) resolve disagreements
- Where?
 - In laboratory (controlled)
 - In natural settings (uncontrolled)

Summative evaluation: Empirical evaluation

- • Empirical: involves users
 - Usability testing
 - Field studies
 - Click-through studies

Why do small studies?

- Nielsen (as well as Virzi and Lewis but less famously) found that you get most benefits (and bugs) from the first ~5 users
- Small studies have:
 - Little cost
 - Limited effects on development timelines
 - Can be done early and often
- Does this mean you never have to test with more than 5 users?

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Why do large studies?

- Complex systems, complex people
- The data are there and it's relatively easy to grab (think A/B testing)
- Require strong, statistically significant combination (e.g., regulation, safety)
- When your boss makes you

Why do formal lab testing?

- Require a controlled environment
- Replicability is a necessity
- Context of use is straightforward to model
- Context of use MUST be modeled

Why do field testing?

- Control and replicability are less essential
- Context of use is variable, nuanced, or otherwise difficult to model
- Need to reach a lot of people who cannot reach the lab (particularly useful to do use remote testing for these people)

How to decide which one to pick?

- It depends on the answer to:
 - How many people are enough
 - Where to test with them
 - How controlled to be
 - How many tests to run them through

Field testing

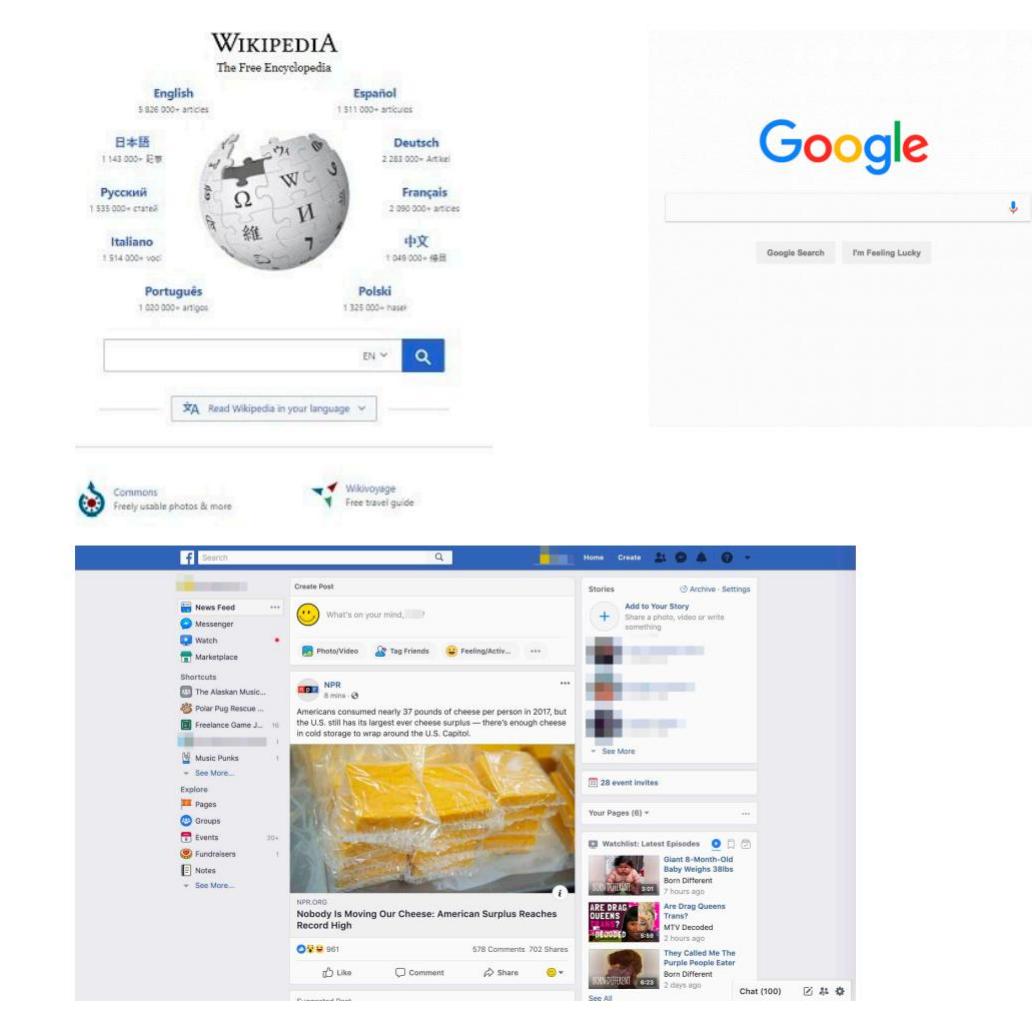
- Experiments in the lab are harder to generalize to new contexts
- Even harder to translate what we learn from a lab study to other tools/contexts
- Very hard in a controlled lab experiment to model the aggregate behaviors of groups (e.g., social media)

Living Labs



Living Labs

- Researchers inside every tech company (and many outside them) are doing A/B testing, log analysis, and generally experimenting on their users



TECHNOLOGY

Everything We Know About Facebook's Secret Manipulation Experiment

It was probably legal. But was it ethical?

ROBINSON MEYER JUN 28, 2014



REUTERS

Updated, 09/08/14

Facebook's News Feed—the main list of status updates, messages, and photos you see when you open Facebook on your computer or phone—is not a perfect mirror of the world.

MORE

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ALEXIS

Big Tech
Experiment
Justice
ALEXIS

Trump
How
News
TAYLO

Maki
Maki
YouTube
TAYLO

But few users expect that Facebook would change their News Feed in order to manipulate their emotional state.

We now know that's exactly what happened two years ago. For one week in January 2012, data scientists skewed what almost 700,000 Facebook users saw when they logged into its service. Some people were shown content with a preponderance of happy and positive words; some were shown content analyzed as sadder than average. And when the week was over, these manipulated users were more likely to post either especially positive or negative words themselves.

This tinkering was just revealed as part of [a new study](#), published in the prestigious *Proceedings of the National Academy of Sciences*. Many previous studies have used Facebook data to examine "emotional contagion," as this one did. This study is different because, while other studies have observed Facebook user data, this one set out to manipulate it.

The experiment is almost certainly legal. In the company's current terms of service, [Facebook users relinquish the use of their data for "data analysis"](#)

Field studies

- Give people a functional prototype of your system and let them use it naturally for a set amount of time
- Also called “in situ” studies, “real world” deployments, or “in the wild”

Field studies: Considerations

- How long? / Novelty effect
- How many people?
- How to recruit?
- How to retain participants?
- Experiential or exploratory?
- What data to collect?

Field studies: Considerations

- How long? / Novelty effect
 - Any new technology will get the most use when it is first introduced, interest wanes
 - How long?
 - Nathan Eagle (MIT) estimates 2 weeks
 - I think it's longer
 - If the goal is to understand realworld use, field deployments should last long enough for the novelty effect to wear off

Field studies: Considerations

- How many people?
 - The more the better (typically), but think about your resources
 - Try to recruit a diverse a sample as possible (and as you need)
 - Think about recruiting proportional to your personas
 - If experimental, might want to recruit a homogenous sample to reduce variables
 - Recruitment: internet ads, word of mouth, “snowball” sampling
 - Consider offering payment to attract and retain

Field studies: Considerations

- Experiential or exploratory?
- Comparing new product against an old one can be very powerful
 - Your new product: experimental
 - Old product: control
 - “participants preferred using product X over product Y 9 times out of 10”
- Exploratory: just give out your product and see what happens
 - Often better in initial stage evaluation

Field studies: Considerations

- What data to collect?
 - Pre- and post- evaluation interviews and surveys
 - Depending on the length of the study, consider mid-study interviews as well
 - Log usage data (if possible)
 - Automatically, with a computer script
 - Timestamped
 - Diary entries after each use
 - Can automatically be prompted after usage

Project milestone submission discussion

- https://docs.google.com/document/u/3/d/1AeLKJ_lt8TEGZK9xthEJ3kbsEHCjTFm3N426MB0JtEo/edit