DESIGN USE BUILD

PAUL G. ALLEN SCHOOL OF COMPUTER SCIENCE & ENGINEERING

CSE 440: Introduction to HCI

User Interface Design, Prototyping, and Evaluation!

Lecture 02: Design Process

Instructor: Amy Zhang, 1/7/2021

Today’s Topics

- UI Hall of Fame and Shame
- Design Process
  - Why do we need to consider users in design?
  - Iterative Design
  - Design Diamond
  - Ideation
- Ideation exercise
- Group Project Overview
- Meet your team and start brainstorming!

UI Hall of Fame or Shame

Twitter, Inc. [US] | https://twitter.com/lulu_cheng/status/964947708275343361

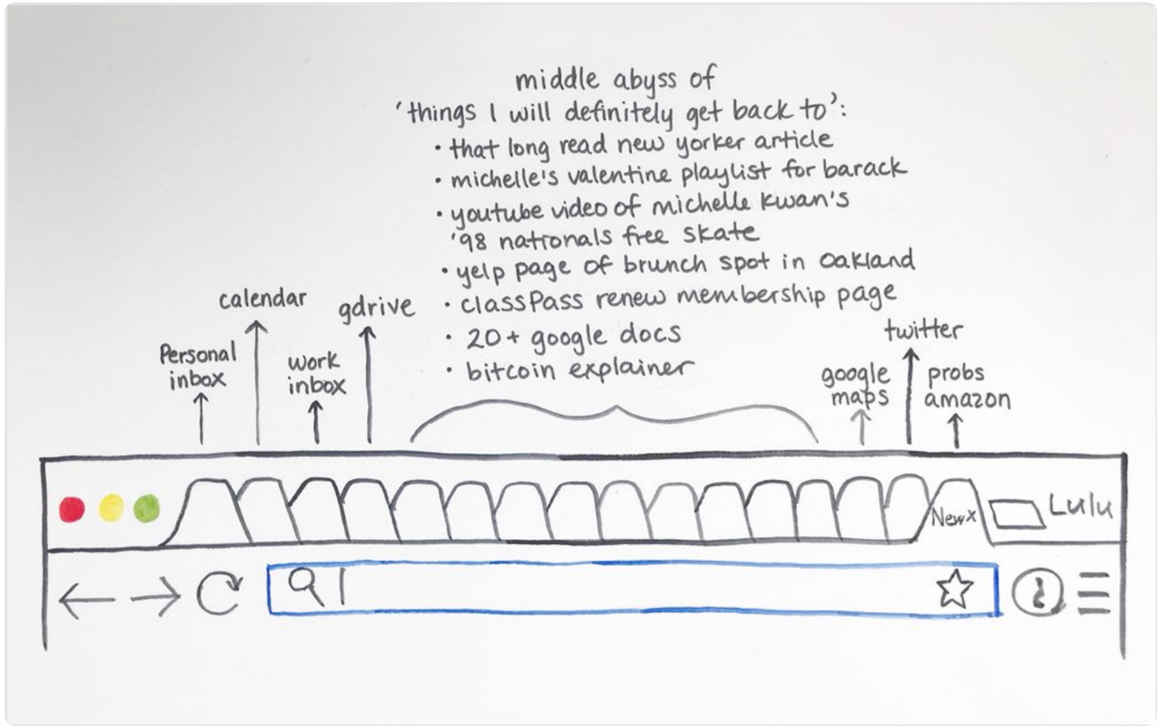
Home

Tweet

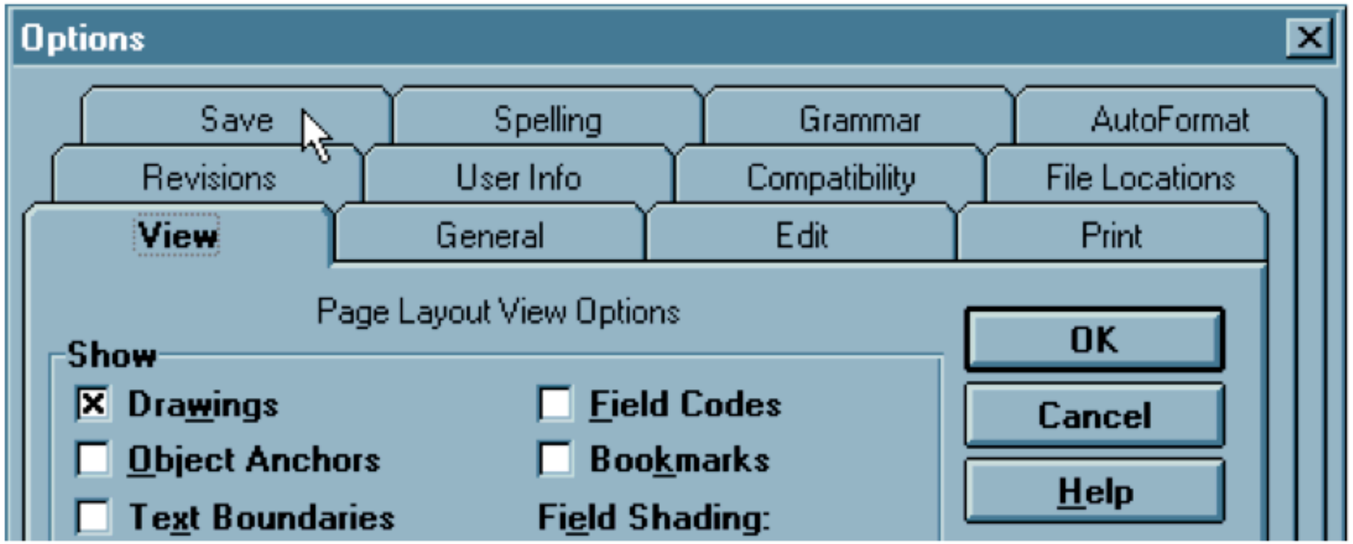
Lulu Cheng
@lulu_cheng

Follow

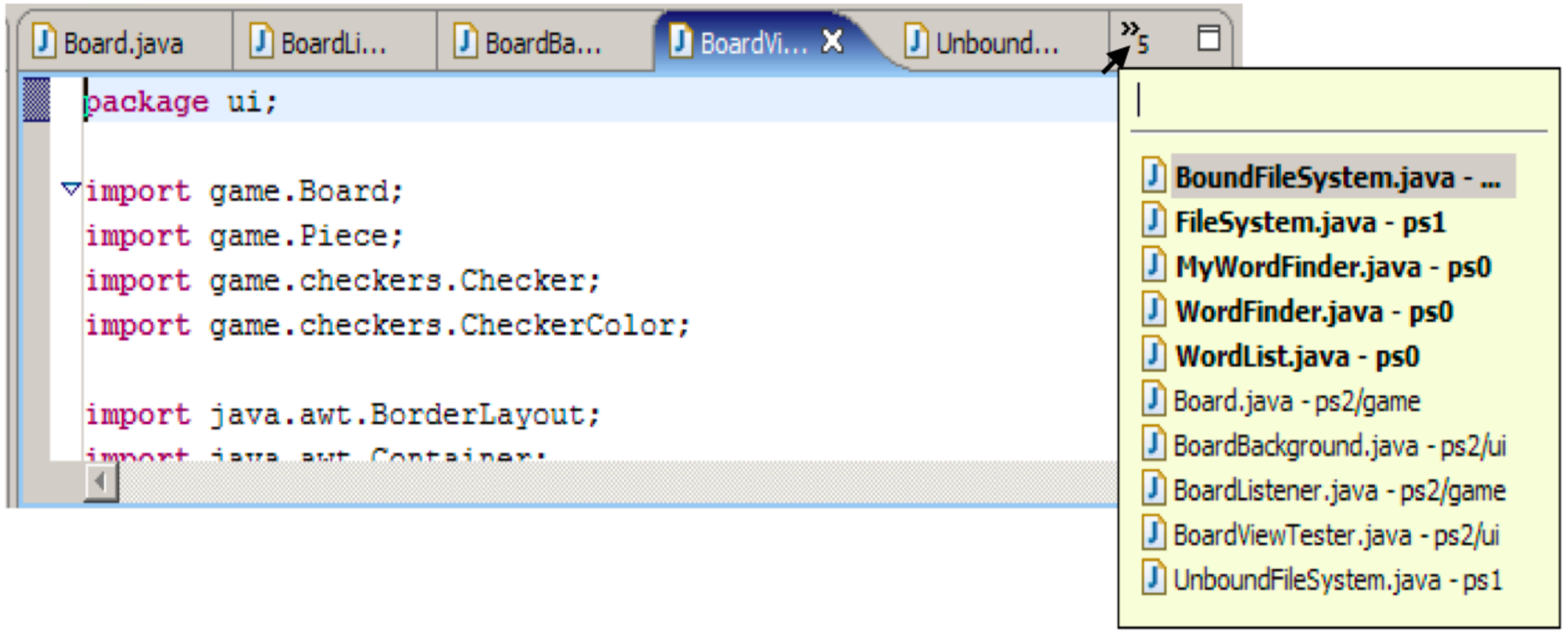
I got 99 tabs but I generally know where things are



Hall of Shame

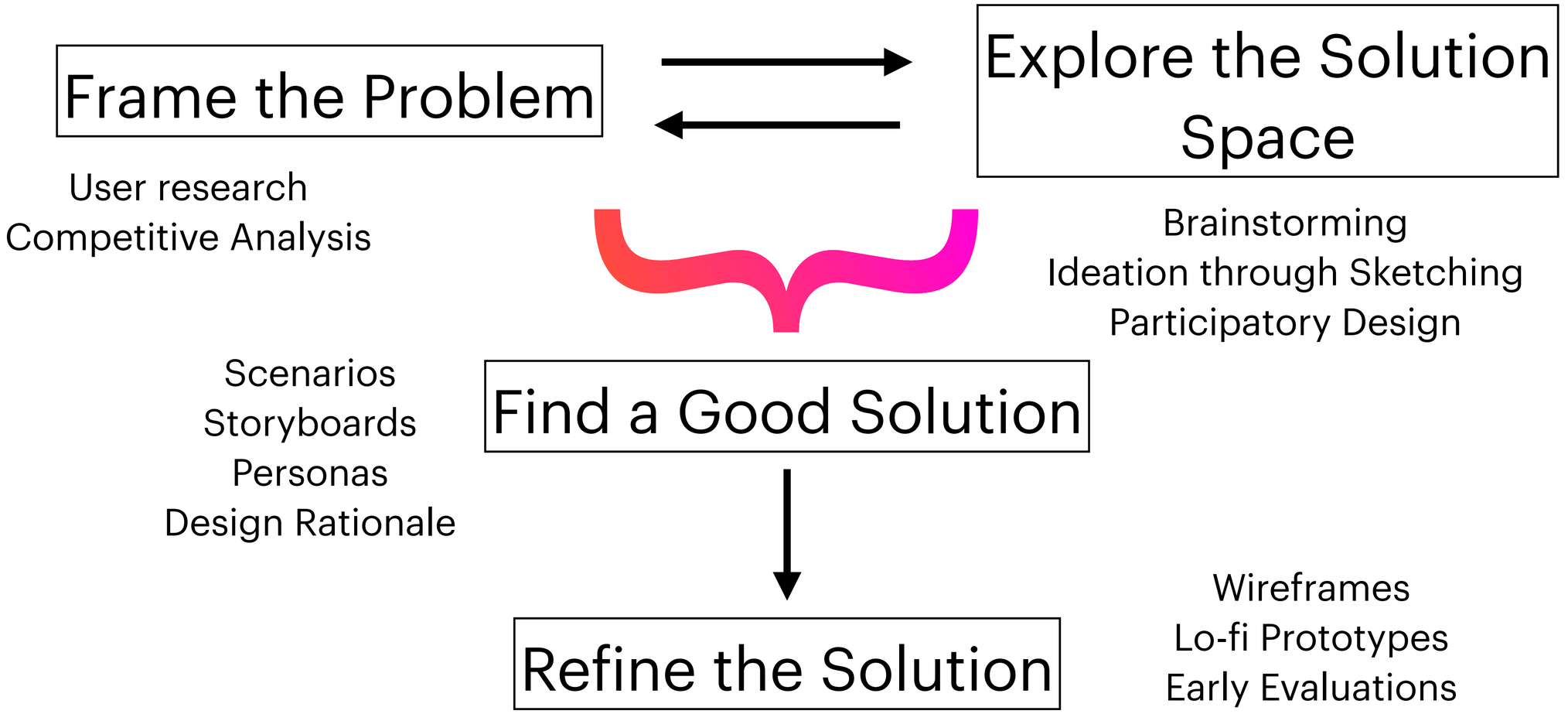


Hall of Fame or Shame?



Design Process

Design Process in a Nutshell



Design Process in a Nutshell

Frame the Problem

User research
Competitive Analysis

Explore the Solution Space

Brainstorming
Ideation through Sketching
Participatory Design

Scenarios
Storyboards
Personas
Design Rationale

Find a Good Solution

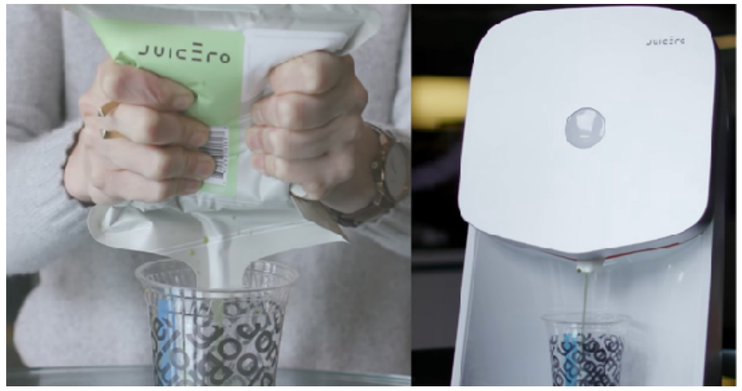
Refine the Solution

Wireframes
Lo-fi Prototypes
Early Evaluations
Mid-fi prototypes
Additional Evaluations

User-Centered Design

Why do we need to center users in design?

[answer in chat]



Bloomberg

Silicon Valley's $400 Juicer May Be Feeling the Squeeze

Two investors in Juicero were surprised to learn the startup's juice packs could be squeezed by hand without using its high-tech machine.

By **Ellen Huet** and **Olivia Zaleski**

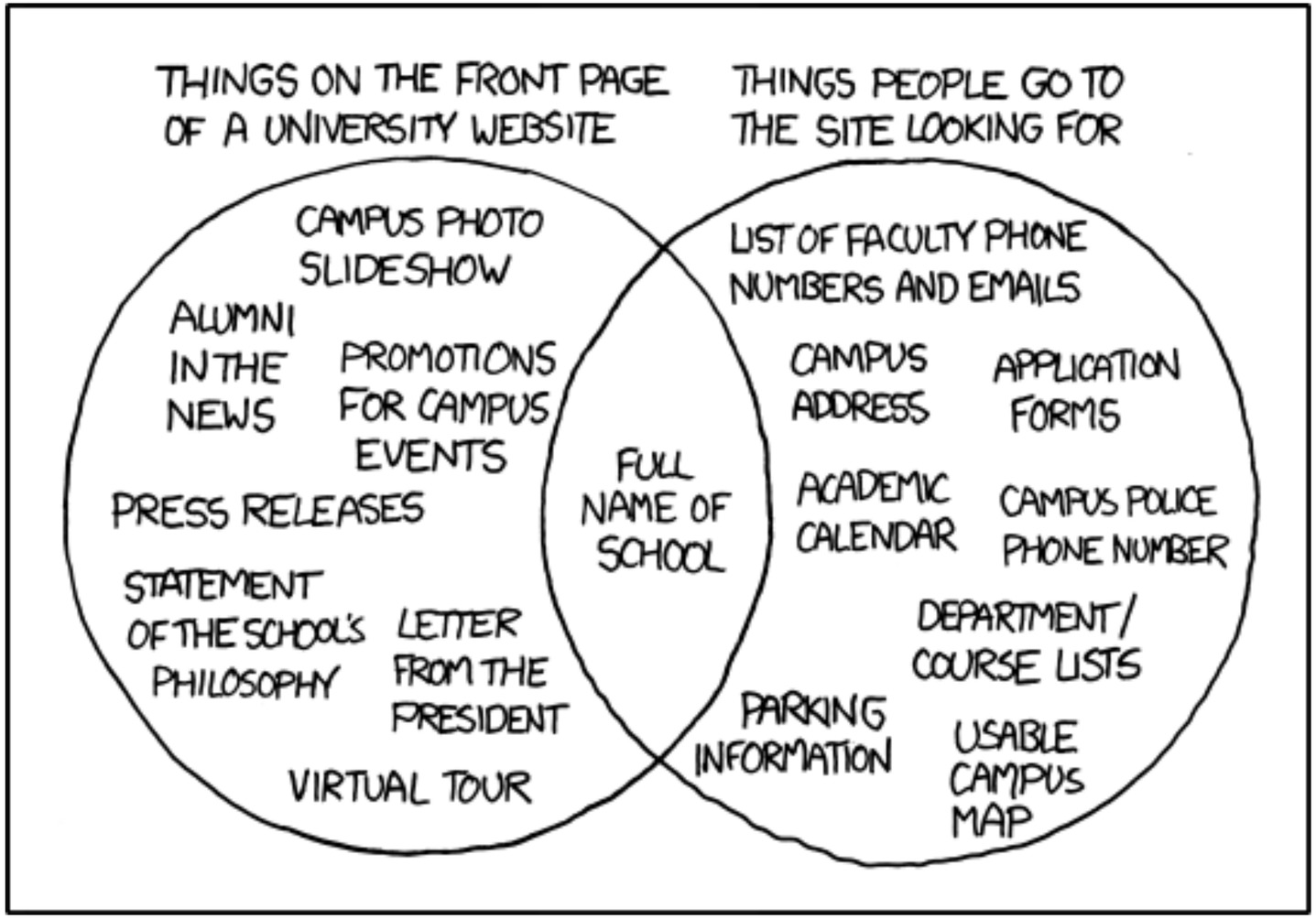
April 19, 2017, 2:00 AM MST

One of the most lavishly funded gadget startups in Silicon Valley last year was Juicero Inc. It makes a juice machine. The product was an unlikely pick for top technology investors, but they were drawn to the idea of an internet-connected device that transforms single-serving packets of chopped fruits and vegetables into a refreshing and healthy beverage.

Doug Evans, the company's founder, would compare himself with Steve Jobs in his pursuit of juicing perfection. He declared that his juice press wields four tons of force—"enough to lift two Teslas," he said. Google's venture capital arm and other backers poured about $120 million into the startup. Juicero sells the machine for $400, plus the cost of individual juice packs delivered weekly. Tech blogs have dubbed it a "Keurig for juice."

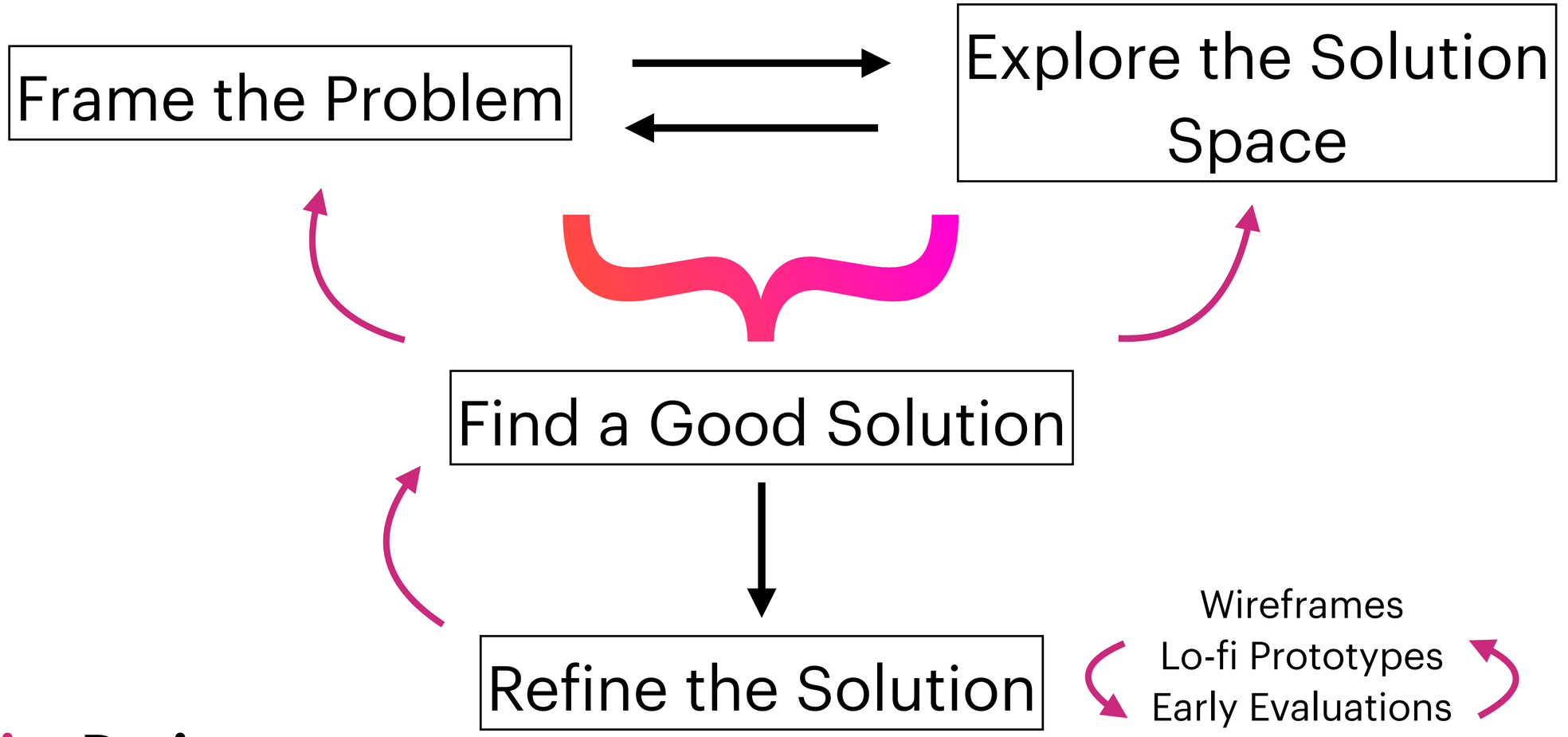
ts

But after the product hit the market, some investors were surprised to discover a much cheaper alternative: You can squeeze the Juicero bags with your bare hands. Two backers said the final device was bulkier than what was originally pitched and that they were puzzled to find that customers could achieve similar results without it. Bloomberg performed its own press test, pitting a Juicero machine against a reporter's grip. The experiment found that squeezing the bag yields nearly the same amount of juice just as quickly—and in some cases, faster—than using the device.

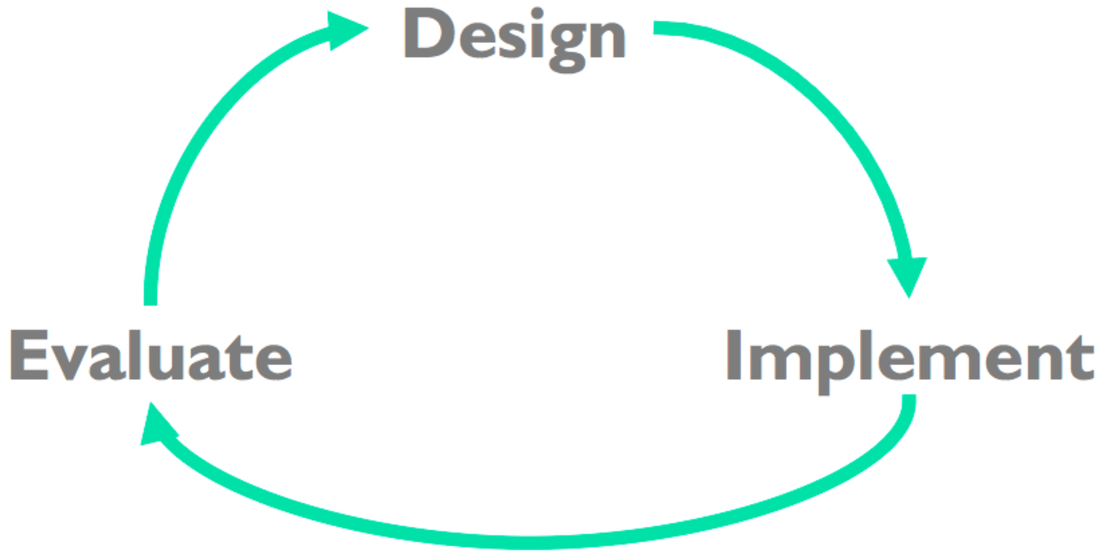

THINGS ON THE FRONT PAGE OF A UNIVERSITY WEBSITE
THINGS PEOPLE GO TO THE SITE LOOKING FOR
CAMPUS PHOTO SLIDESHOW
ALUMNI IN THE NEWS
PROMOTIONS FOR CAMPUS EVENTS
PRESS RELEASES
STATEMENT OF THE SCHOOL'S PHILOSOPHY
LETTER FROM THE PRESIDENT
VIRTUAL TOUR
FULL NAME OF SCHOOL
LIST OF FACULTY PHONE NUMBERS AND EMAILS
CAMPUS ADDRESS
APPLICATION FORMS
ACADEMIC CALENDAR
CAMPUS POLICE PHONE NUMBER
DEPARTMENT/ COURSE LISTS
PARKING INFORMATION
USABLE CAMPUS MAP

But how do we add users’ feedback to our process?

Design Process in a Nutshell

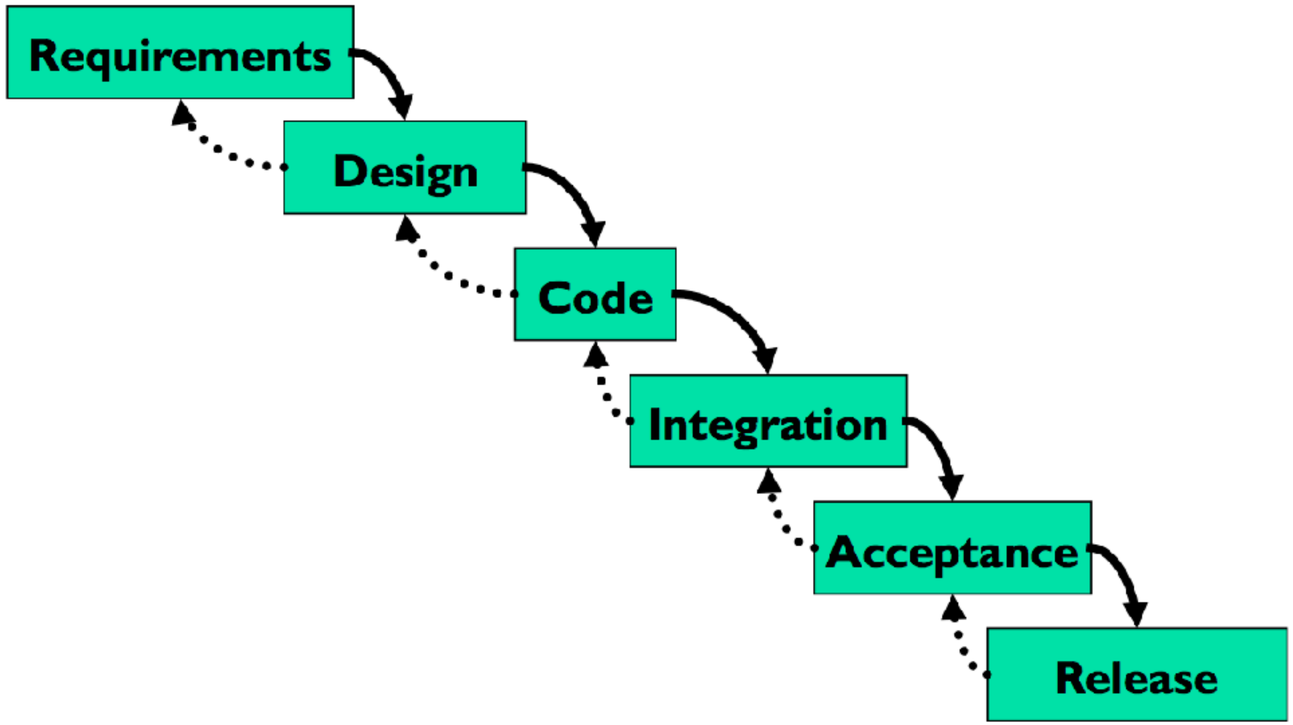


Iterative Design



Iterative Design

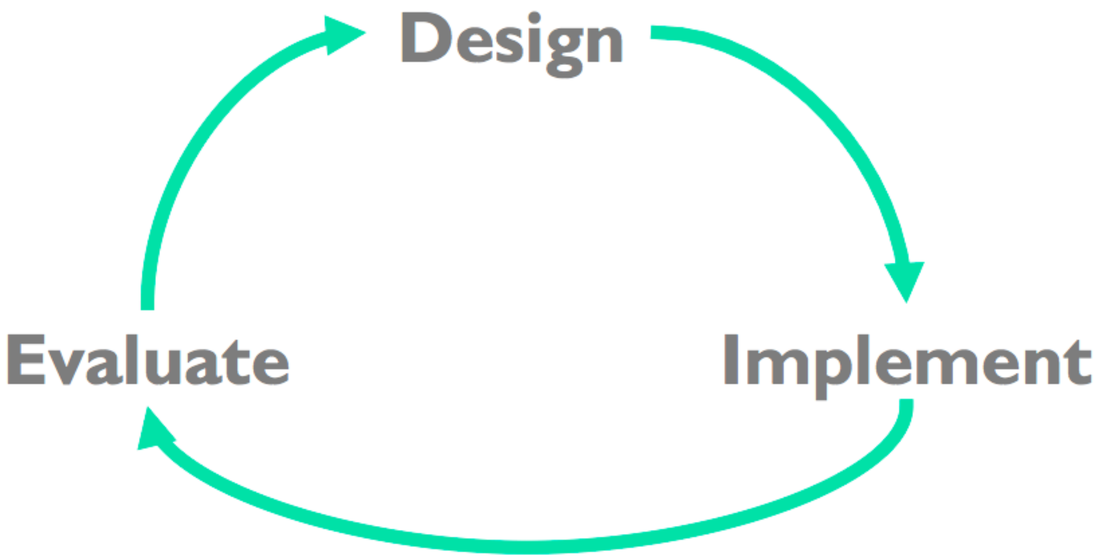
Traditional Waterfall Model



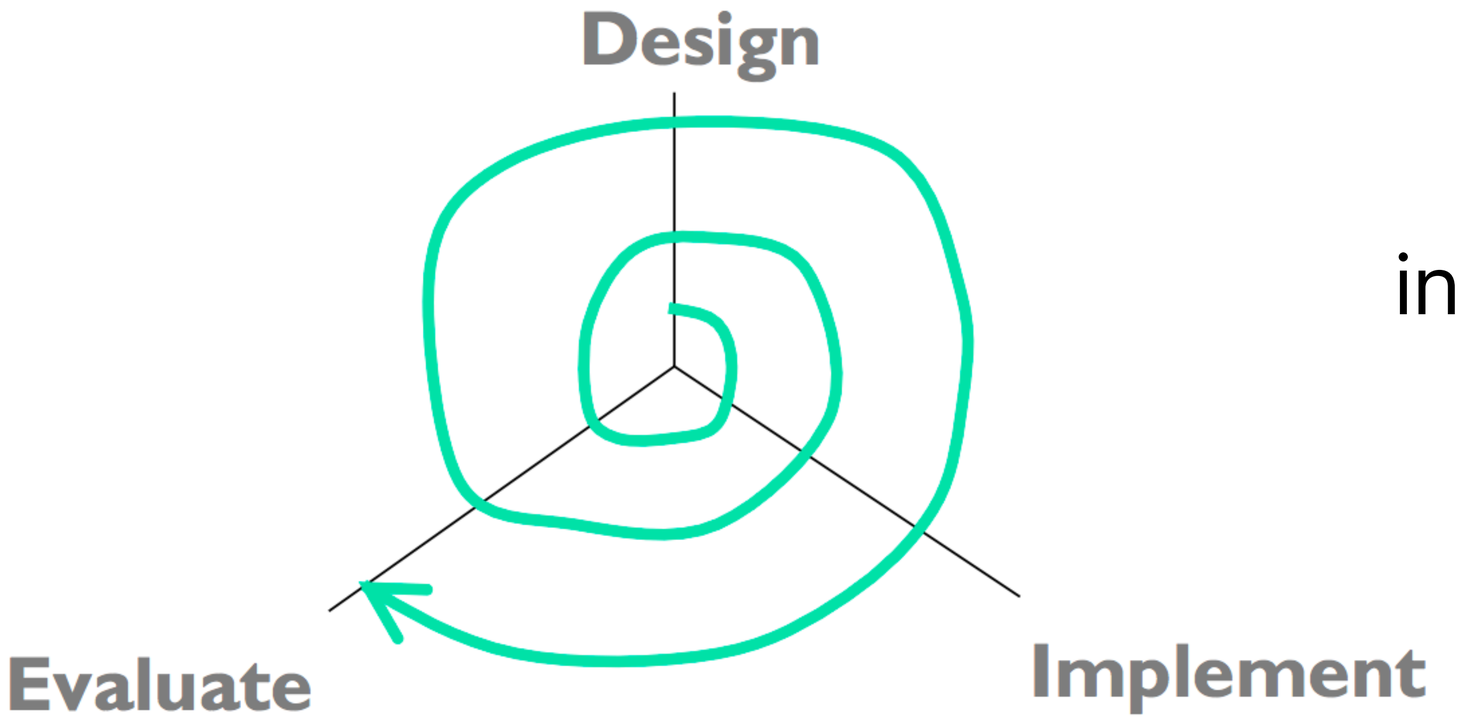
Why is the waterfall method bad for designing UIs?

- User interface design is risky
- Users are not involved in validation until the acceptance test at the end
- UI flaws often cause changes in requirements and design

Iterative Design



- You won’t get it right the first time!

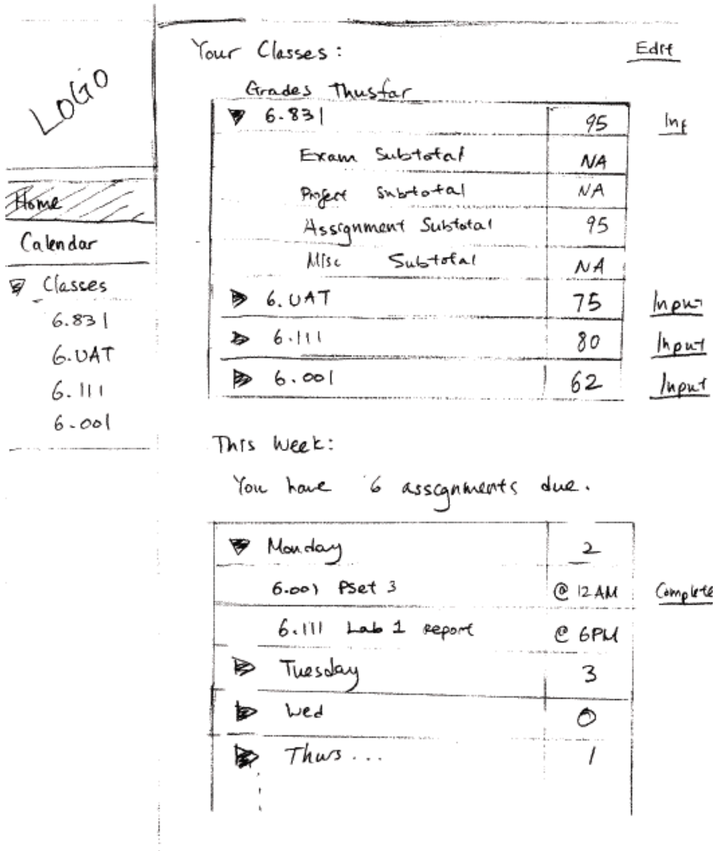


Spiral Model

increases in fidelity with each iteration

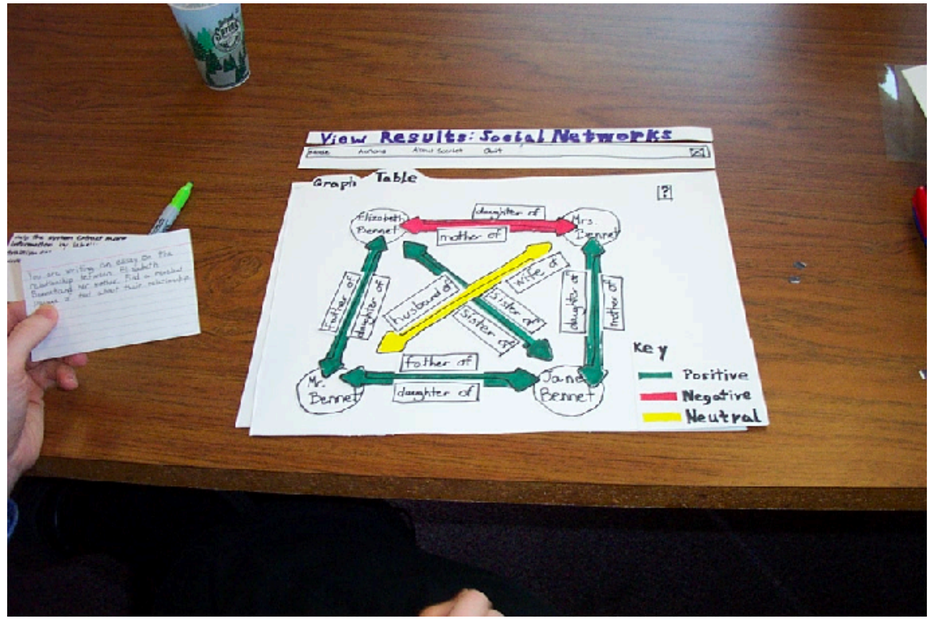
Examples of Early Prototyping

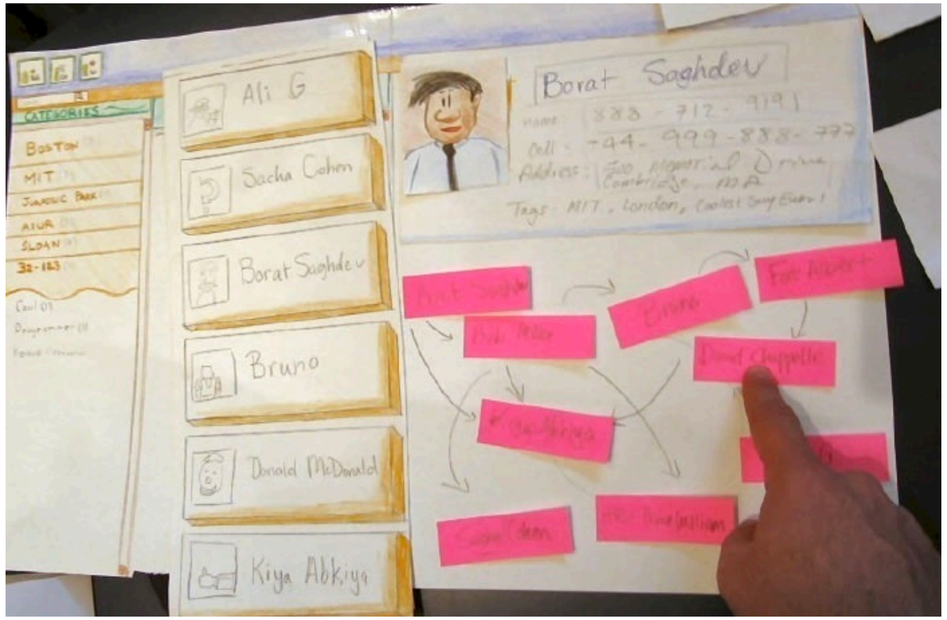
Sketches



Examples of Early Prototyping

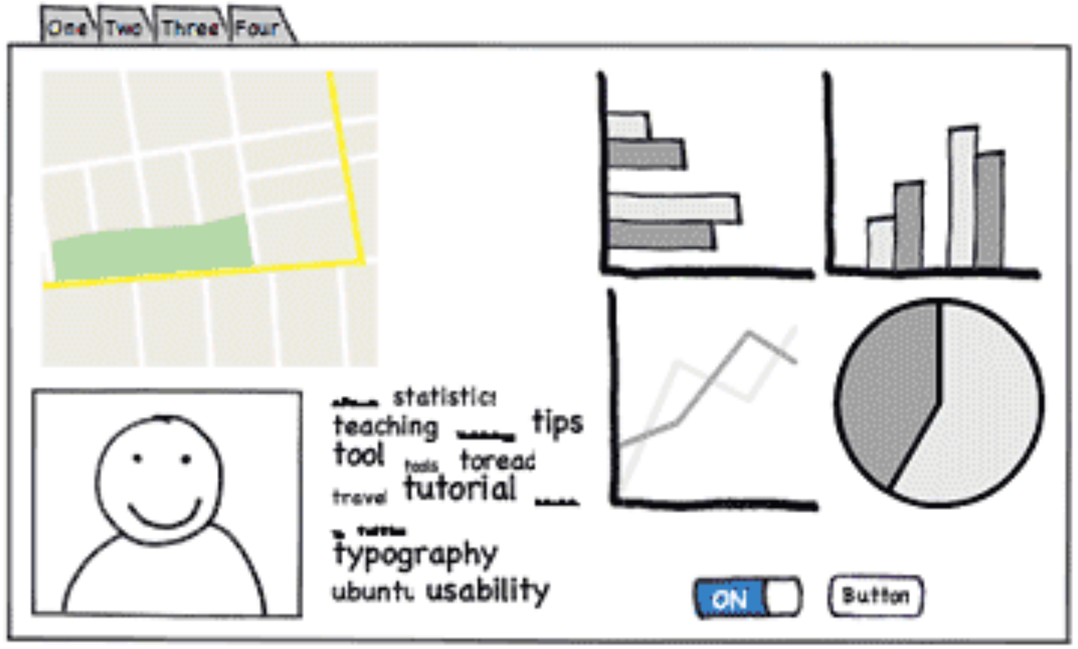
Paper Prototypes

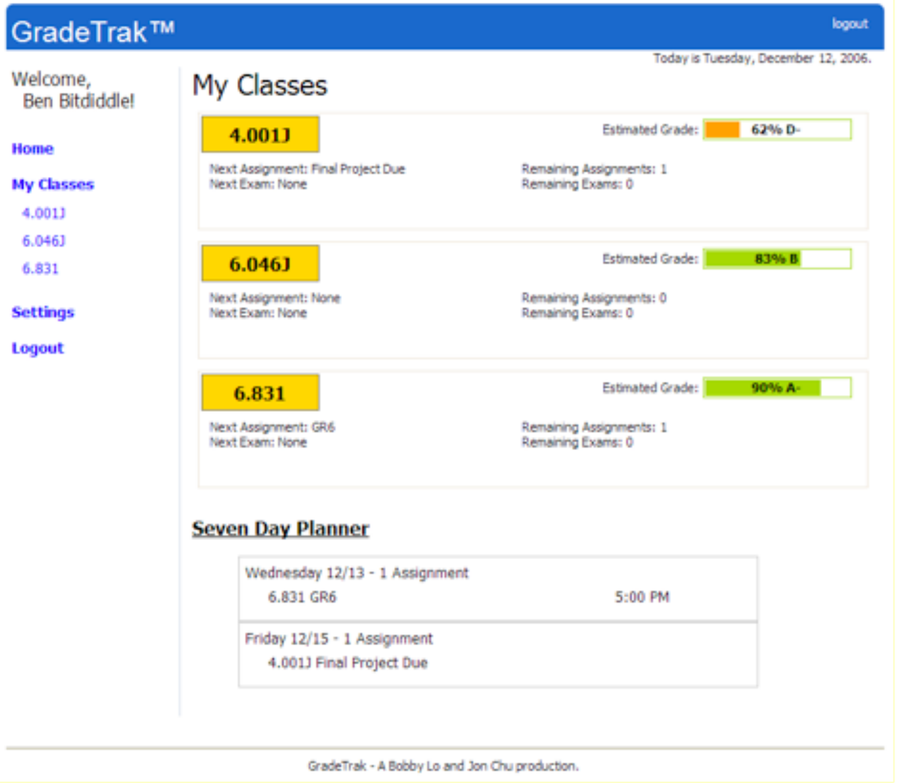




Examples of Early Prototyping

Wireframes and Digital Mockups

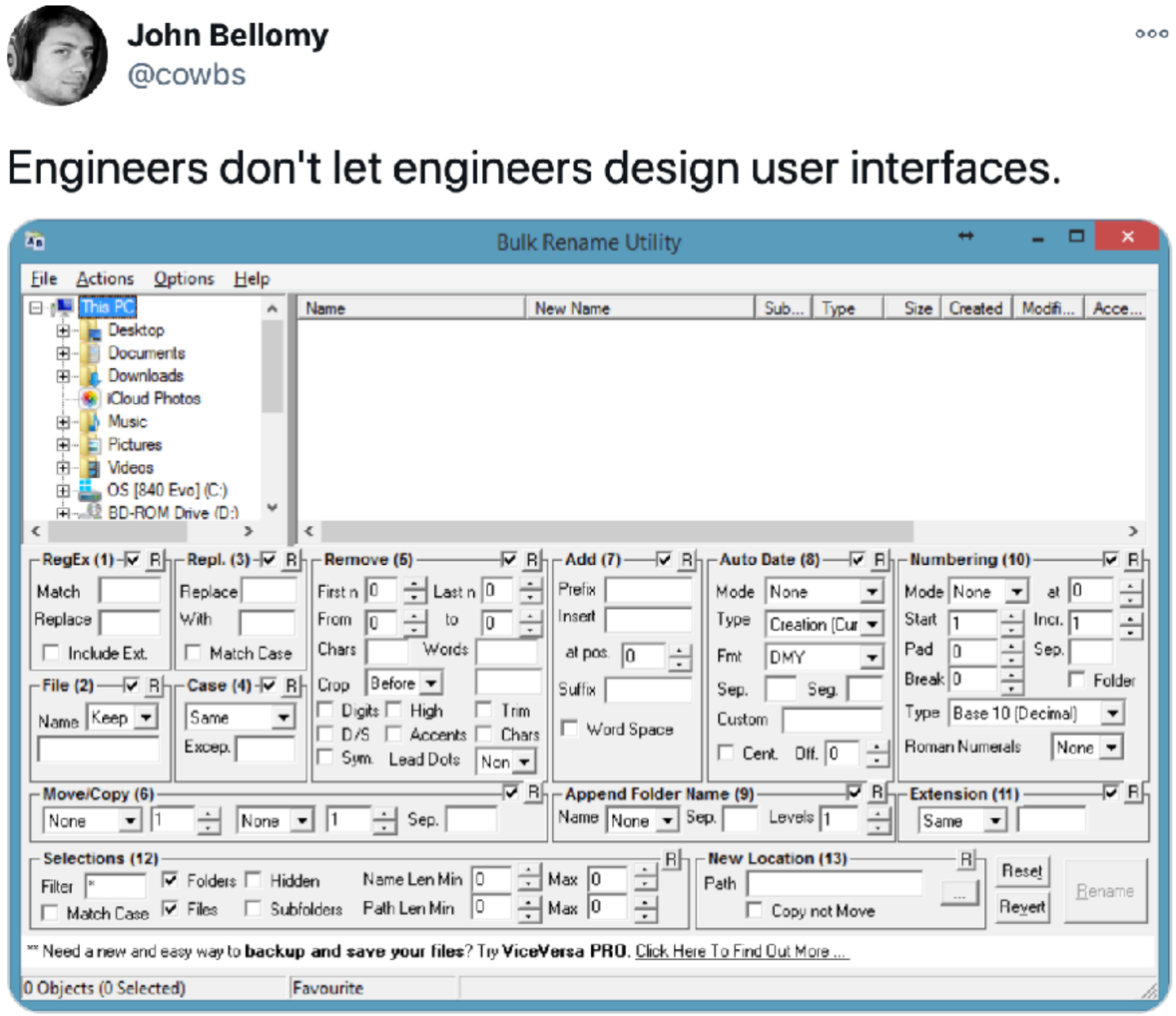




The Rapid Ideation Lab asked users how they would create the cars of the future.

https://www.lassor.com/student-project/rapid

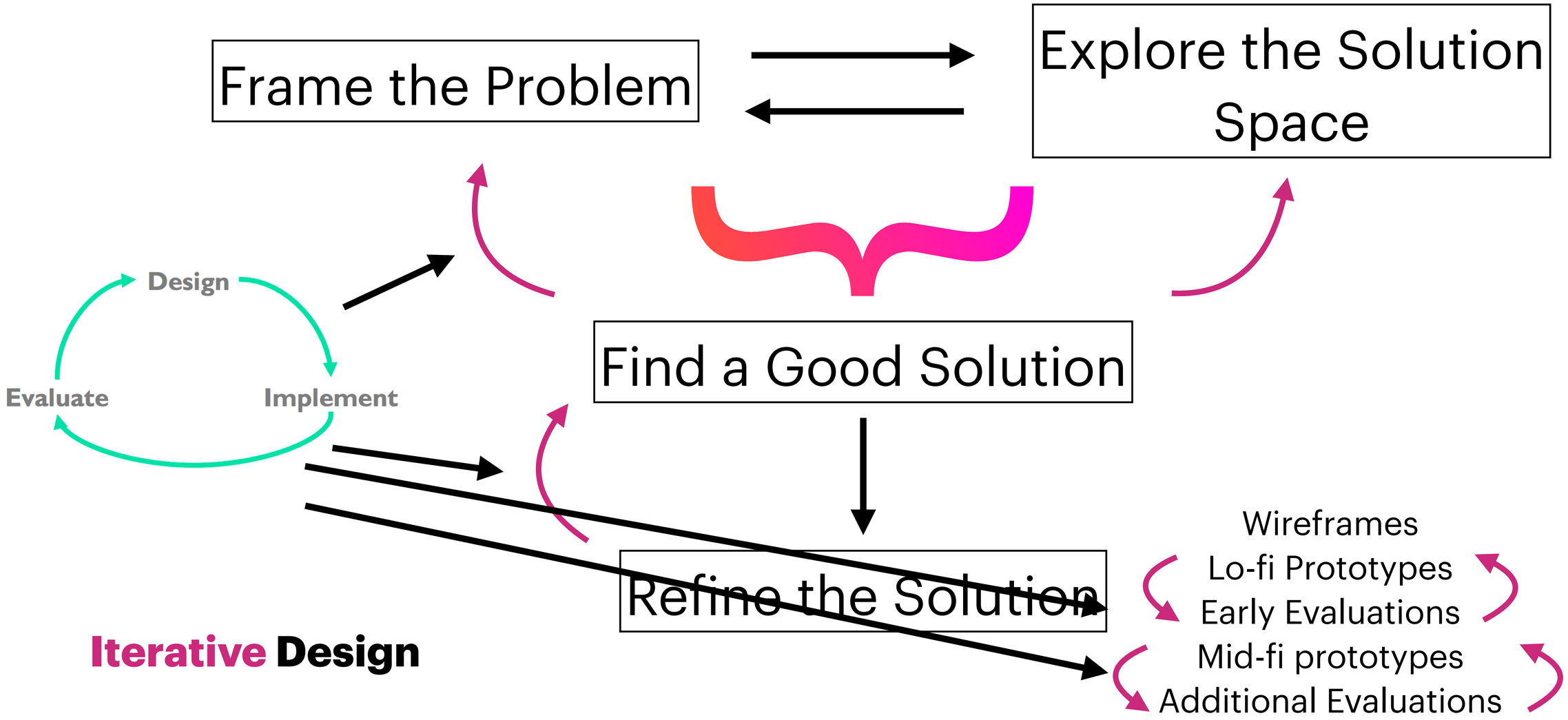
Early Prototyping can detect problems



Pros of Iterative Design

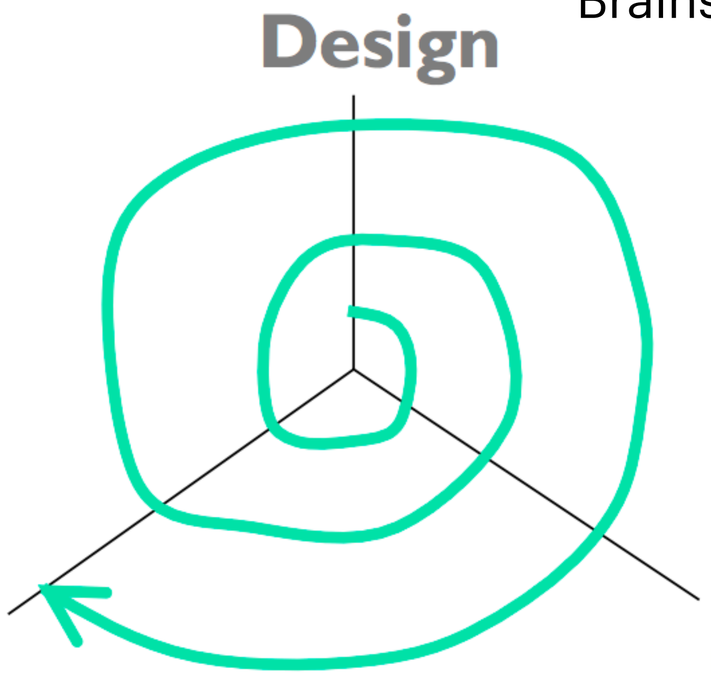
- Early iterations use cheap prototypes
- Later iterations use richer implementations, after UI risk has been mitigated
- More iterations generally means better UI
- Only mature iterations are seen by the world

Design Process in a Nutshell



Iterative Design

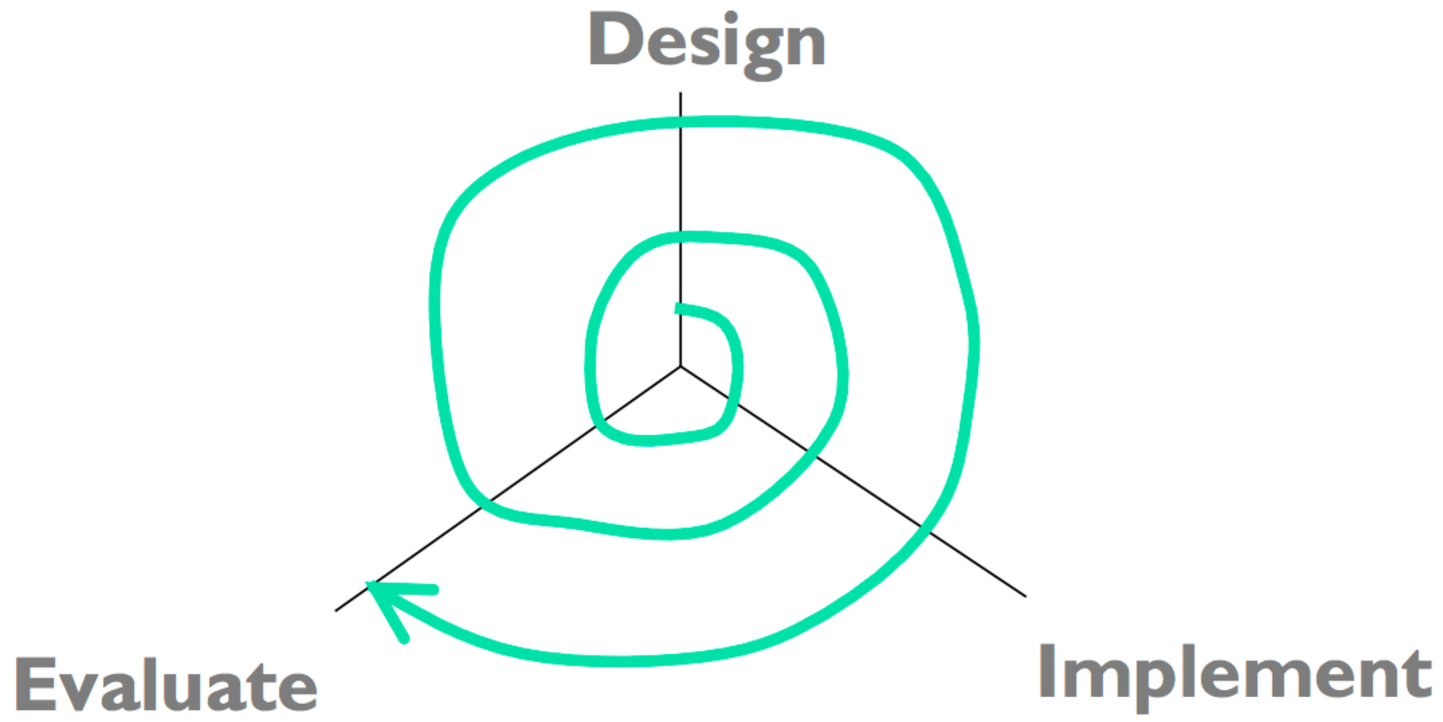
Observation
Needfinding
Idea generation
Brainstorming



Critique
Wizard-of-oz
Heuristic evaluation
User study

Sketch
Paper prototype
Video prototype
Wireframe
Digital prototype

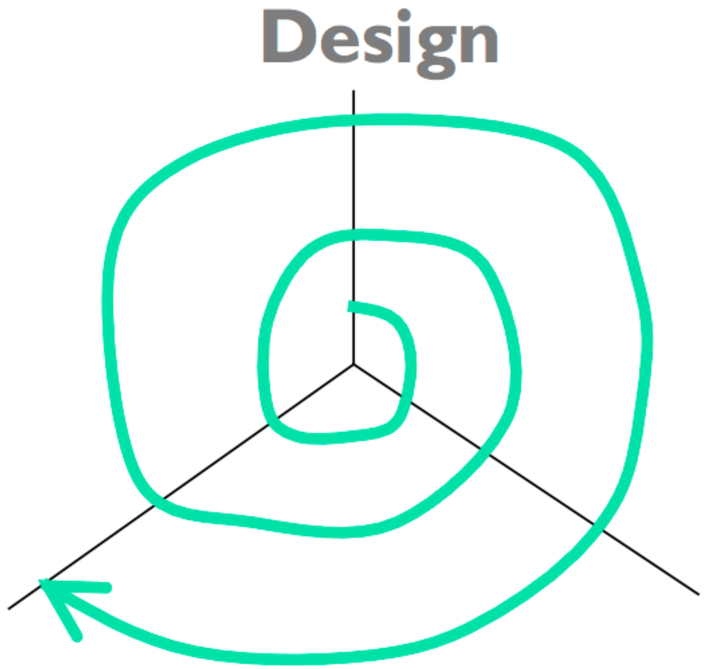
03 - Ideation
06 - User Research



03 - Critique
11 - Interface Evaluation
13 - Heuristic Evaluation

09 - Sketching
12 - Paper Prototyping
14 - Interface Implementation

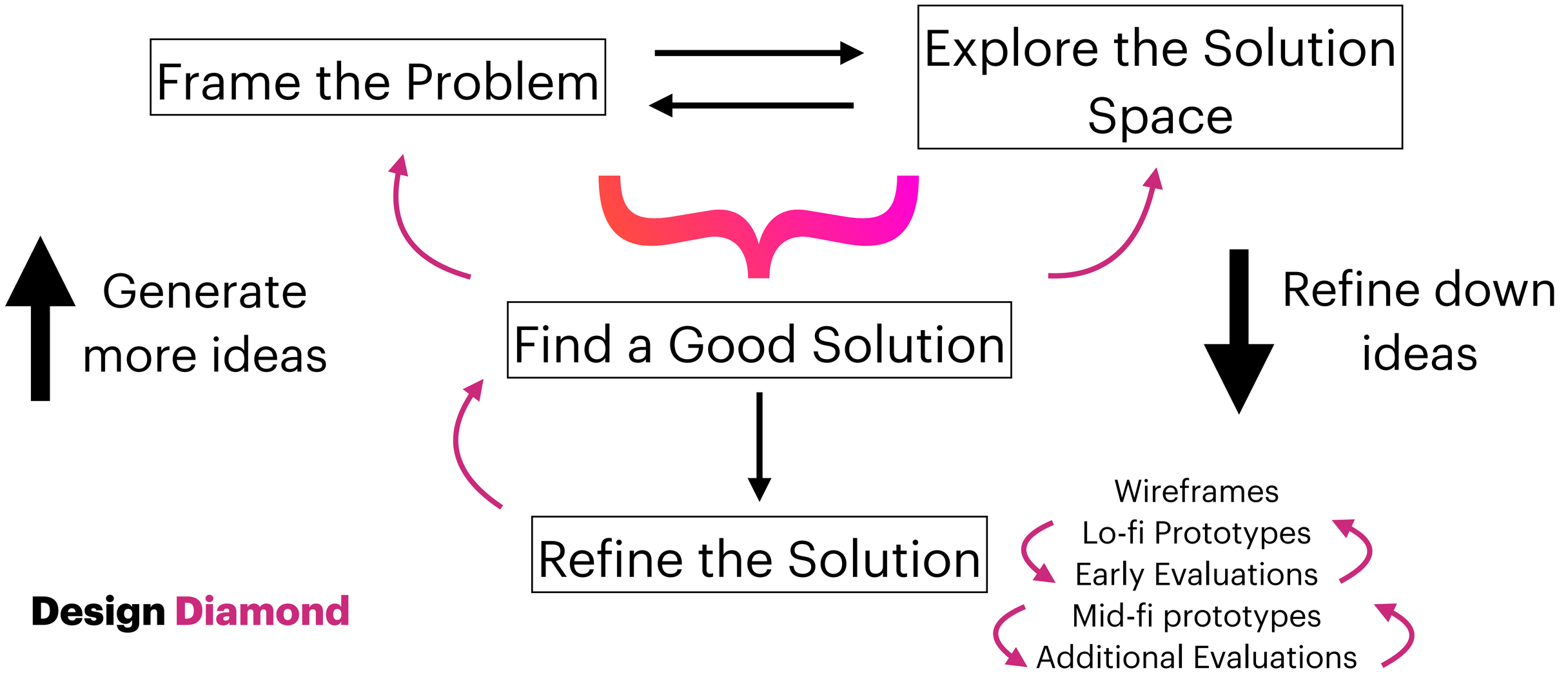
1a, 1b: Project Brainstorm
2a, 2b, 2c, 2d: Getting the Right Design



2e, 2f: Design sketches
3a: Paper Prototype
3d: Preliminary Mockup
3e: Design Blogpost + finished mockup

3b: Heuristic Evaluation
3c: Usability Testing

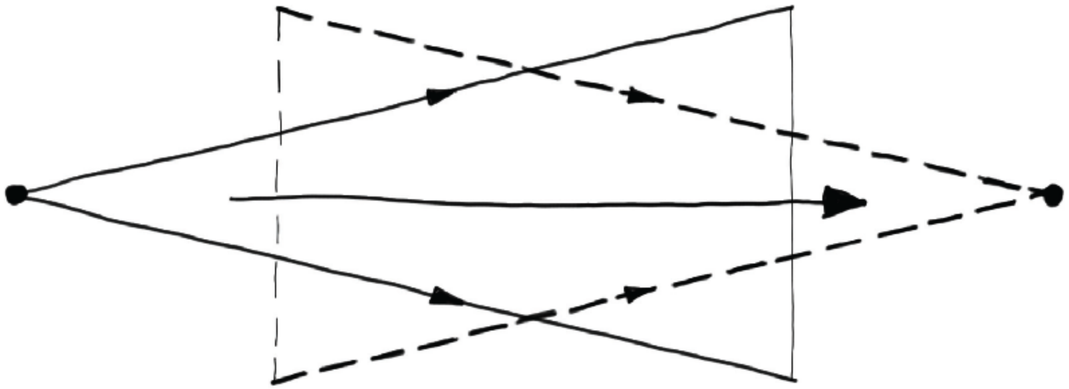
Design Process in a Nutshell



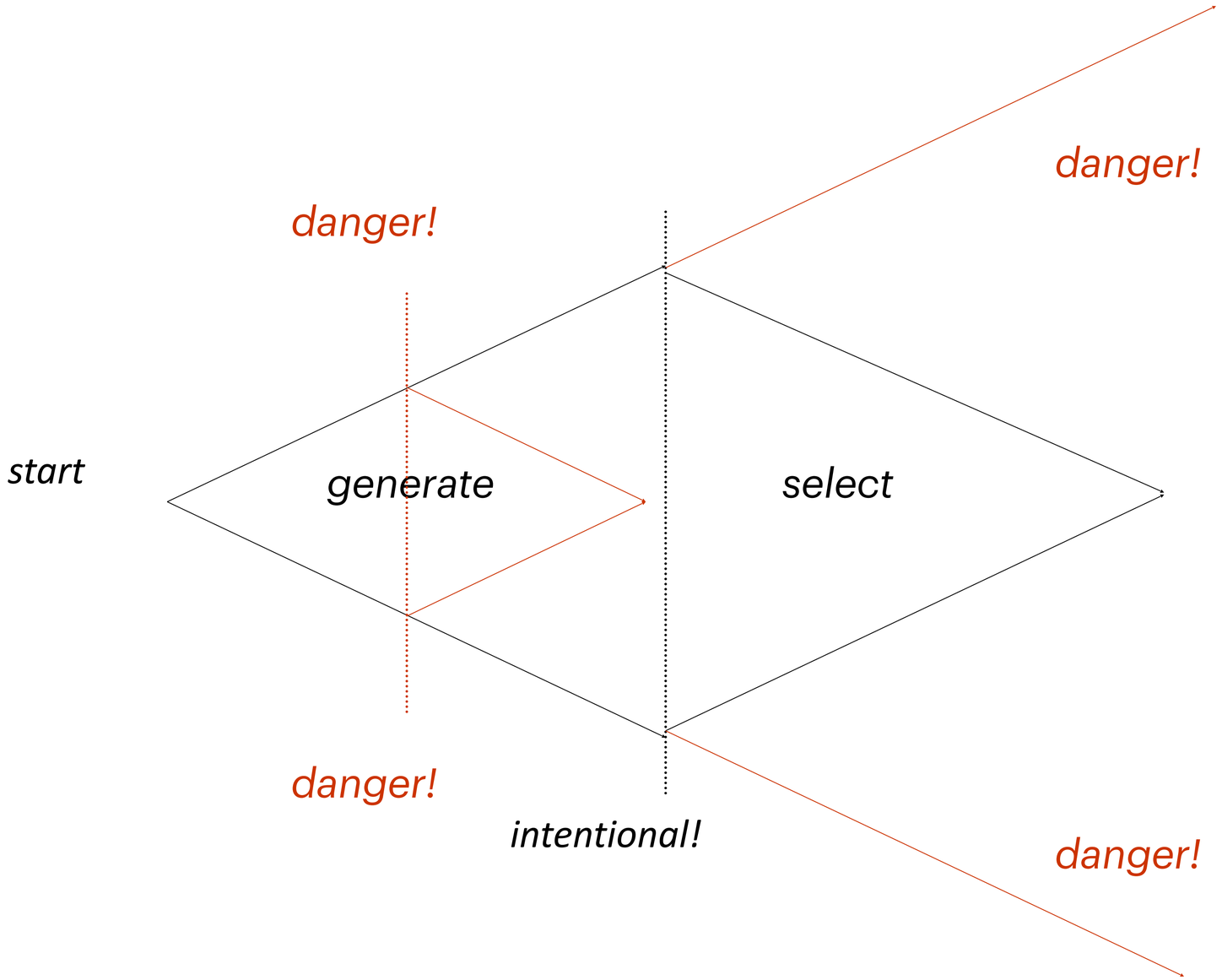
Design Diamond

Elaboration

Reduction

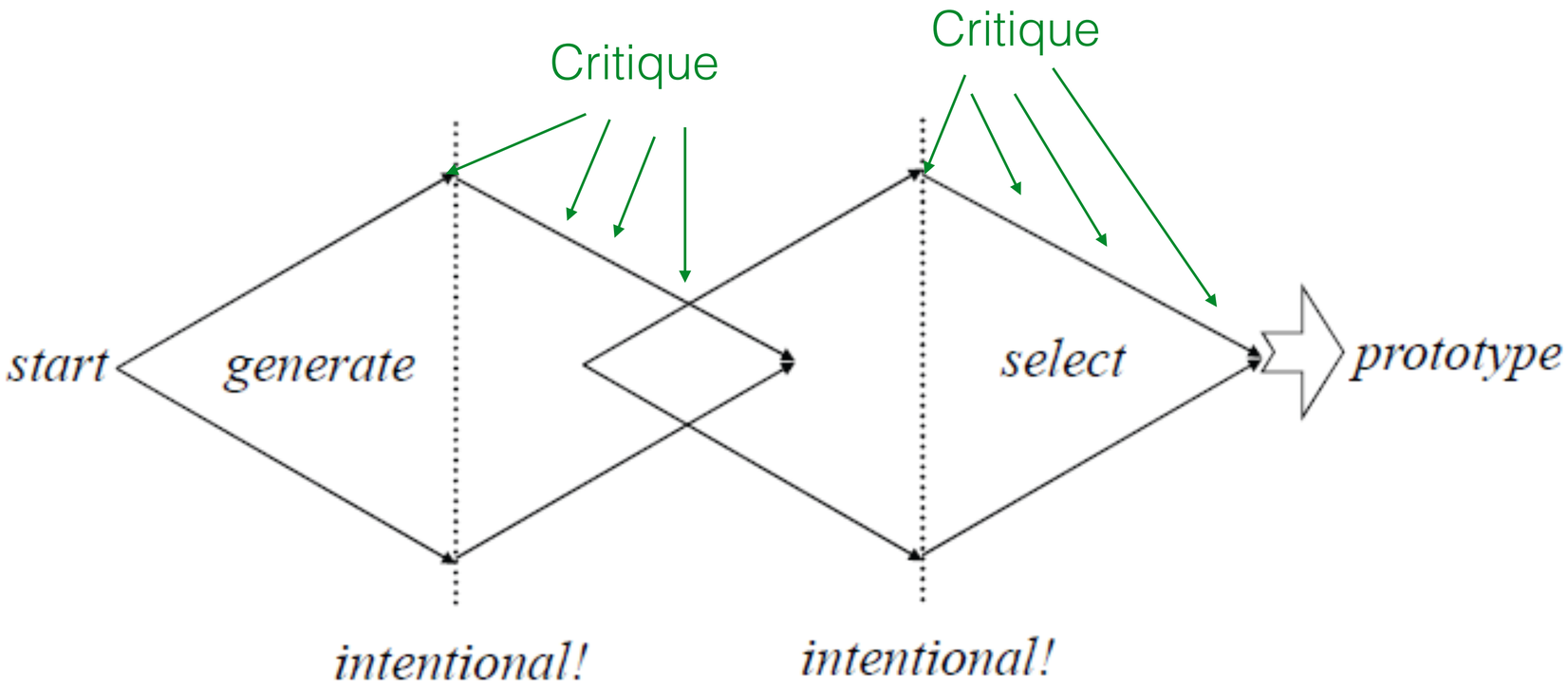


Design Diamond


danger!
danger!
start
generate
select
danger!
intentional!
danger!

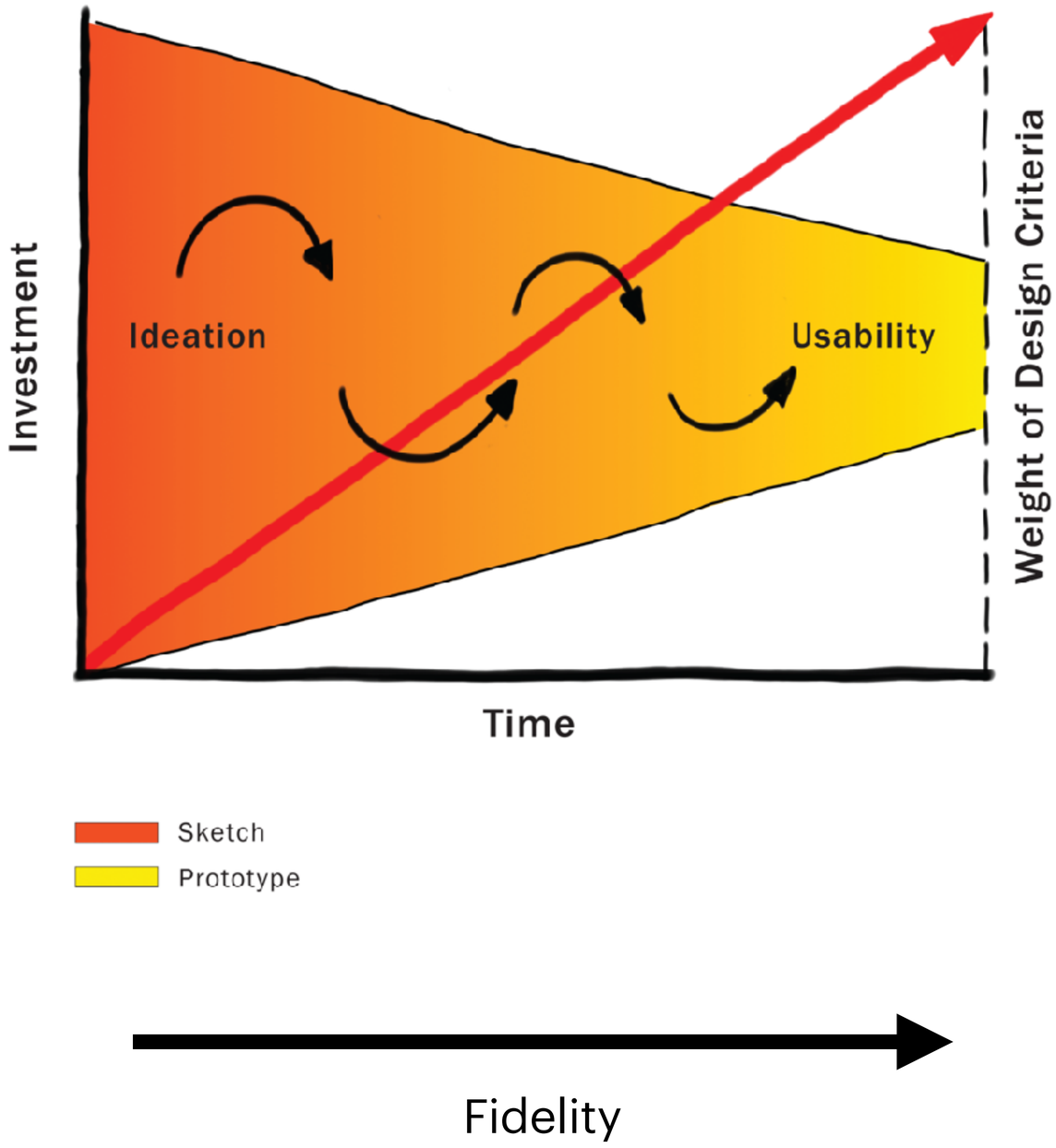
The Role of Critique

- Ideas can be both good and bad
  - BOTH are useful in design
  - By making clear what is a bad design, we can avoid implementing it
  - Bad ideas help justify your good ideas and clarify what makes them good
- Feedback can turn a good idea into a great idea

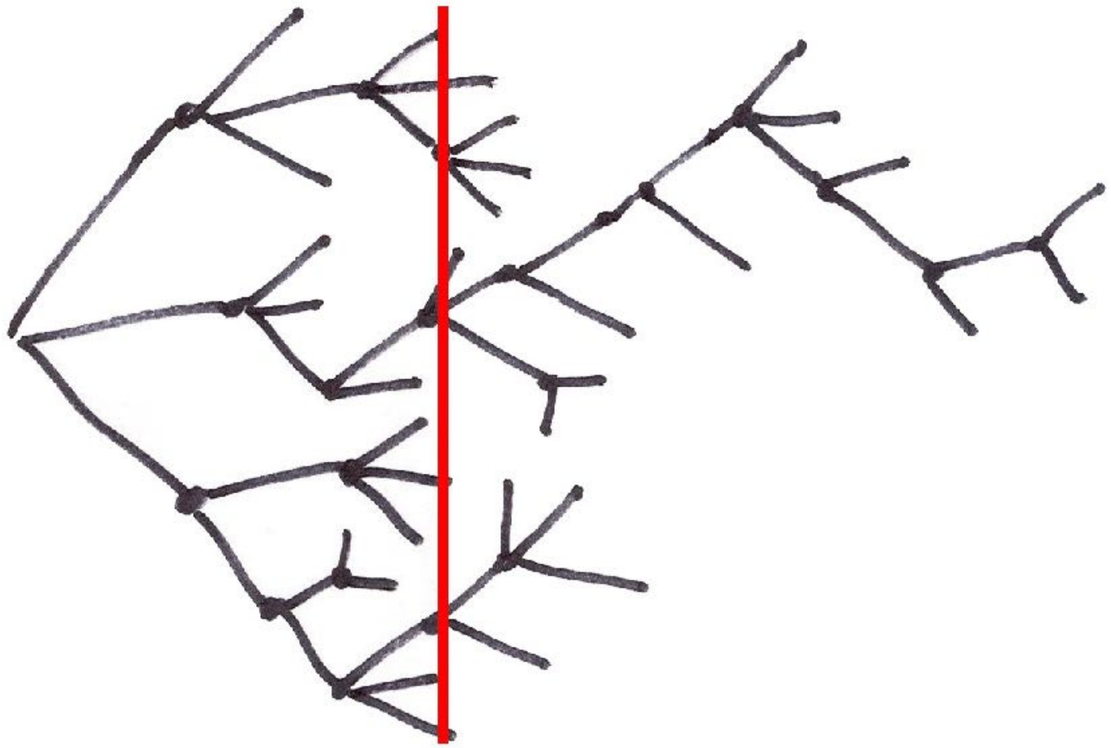

Critique
Critique
start
generate
select
prototype
intentional!
intentional!

Combining design diamond with iterative design and spiral model

- By starting with low fidelity and moving to higher, we can more easily achieve a design diamond process earlier in the timeline (the “diamond” gets smaller over time)



- This is called **parallel design**:
  - Build and test multiple prototypes at the same time to explore design alternatives
  - Easy to do when sketching or making lo-fi prototypes!
- That’s in contrast to **serial design**
  - More useful during later stages of prototyping



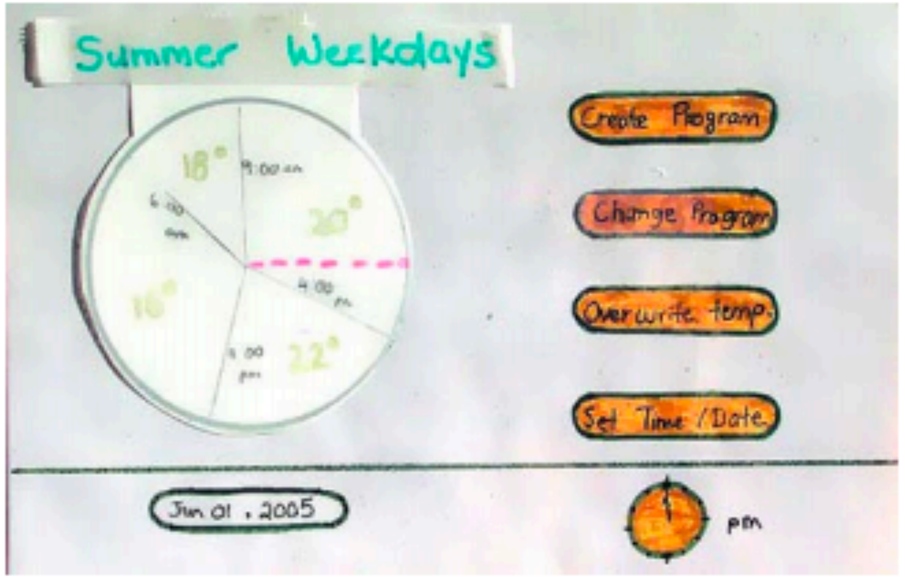


Figure 1. The "Circular" paper prototype

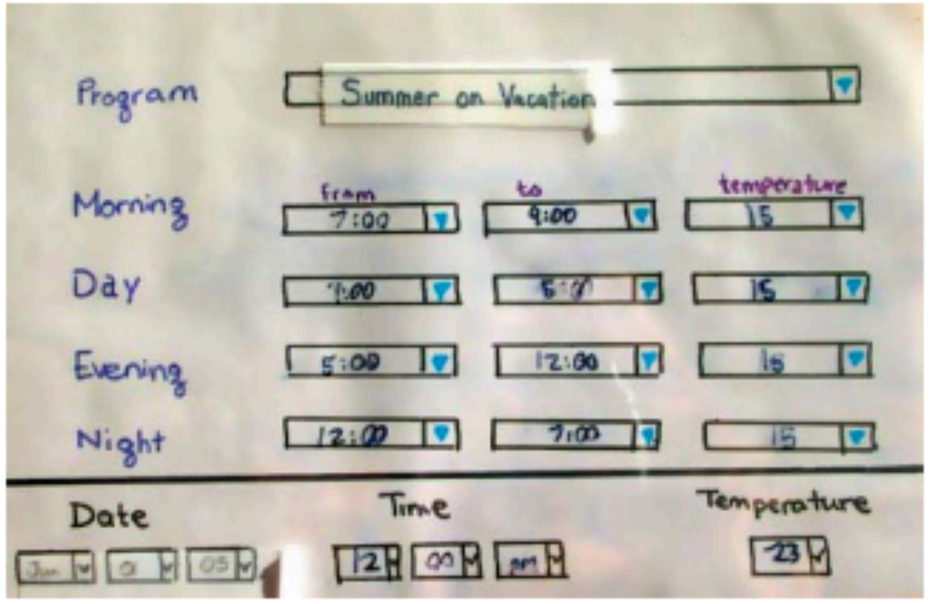


Figure 2. The "Tabular" paper prototype

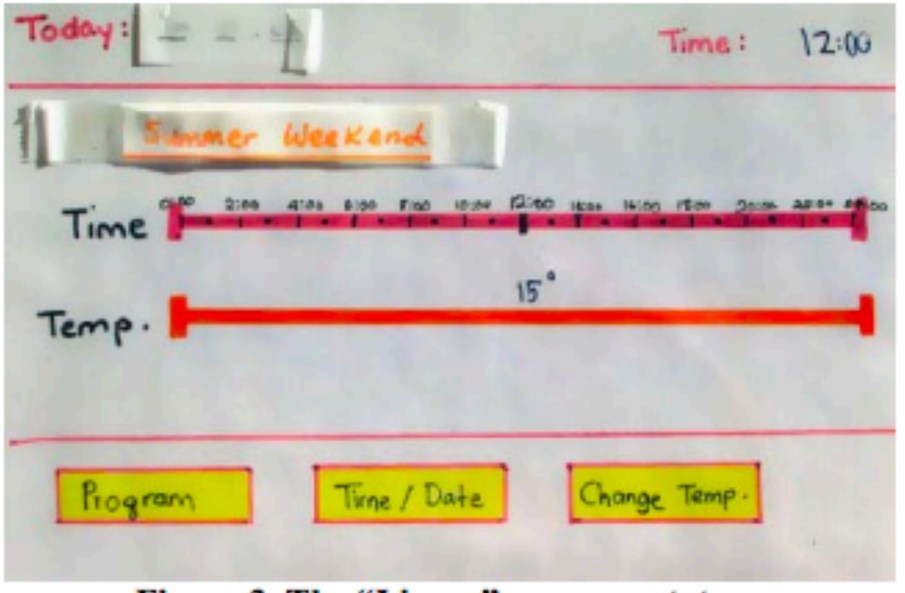
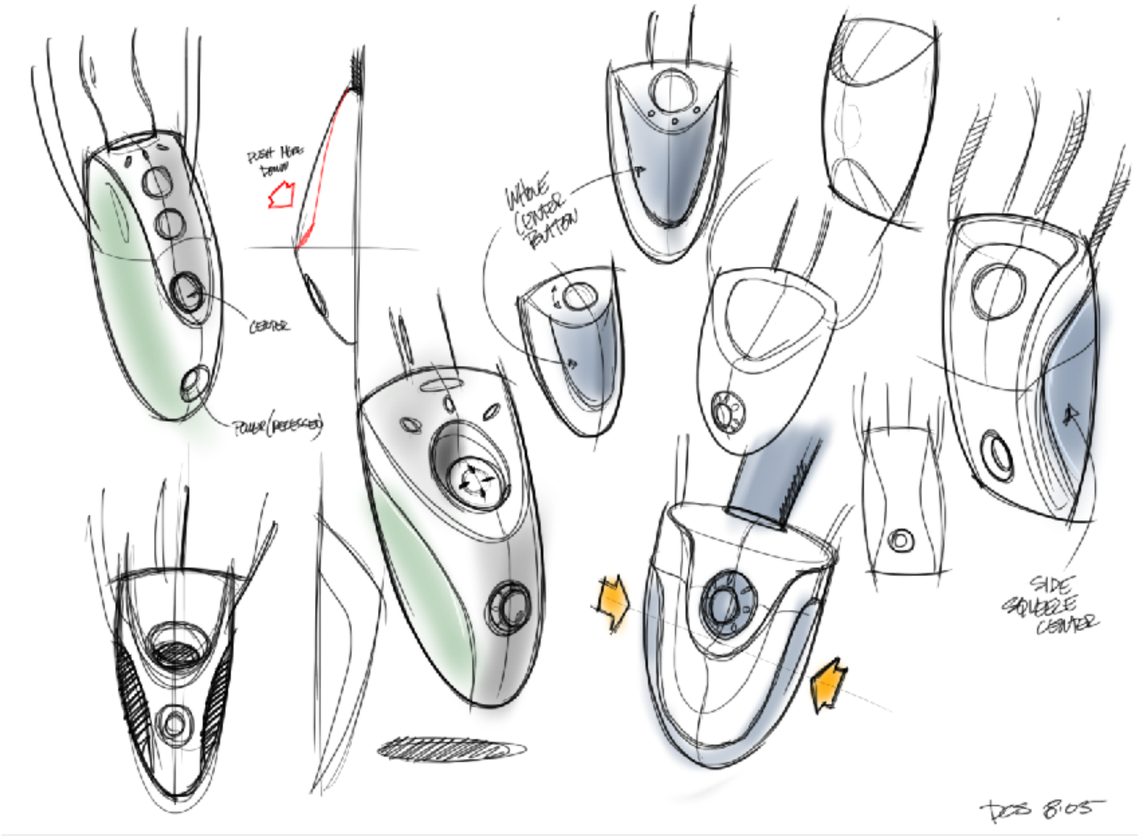


Figure 3. The "Linear" paper prototype

Ideation

Sketching

- A way to think through ideas, explore alternatives, and convey them to others very early in the design
- Easy to make, easy to throw away, so you don’t get too attached
- Quantity over quality - bad ideas are also useful!



By Reid Schlegel: https://www.youtube.com/watch?v=FVx9RLCnJH8

Ideation Exercise

The Tea Alignment Chart

	INGREDIENT PURIST (Must at least partly be produced by heat processing plant leaves)	INGREDIENT NEUTRAL (Can be any form of plant-based product)	INGREDIENT REBEL (Can contain literally anything, be it drinkable or not)
FORM PURIST (Must be a drink that is usually served warm in a handled cup)			
	"Black tea is a tea"	"Lemon water is a tea"	"Chocolate latte is a tea"
FORM NEUTRAL (Must be a liquid stored in a container convenient to drink from)			
	"Bubble tea is a tea"	"Minestrone is a tea"	"Gamer girl bath water is a tea"
FORM REBEL (Can be any liquid in a form not necessarily convenient to drink from)			
	"Tea tree oil is a tea"	"Natural resin is a tea"	"Battery acid is a tea"

Sketching Part 1 (3 min)

- By yourself, sketch 5 new designs for a cup
- Try to push yourself to think of 5 vastly different designs by considering very different contexts and use cases for a cup
- What assumptions are you making about how cups are used? What happens when you get rid of one of those assumptions?

	Lawful	Neutral	Chaotic
Good			
Neutral			
Evil			

Sketching Part 2 (6 min)

- Consider how your 5 designs explore different **dimensions** of the **design space** of cups (color, size, shape, material, etc.)
- Throw out those old ideas and now come up with 10 **new** cup designs that stretch those dimensions out or combine them in new ways.
- Purposefully come up with bad/ridiculous designs!
- From these 15 cup designs, pick 2-3 that are your favorite (you'll also be sharing these later in groups).
- Answer questions at: http://www.yellkey.com/speech

Reflection

- What was hard about this exercise? [type in the chat]
  - Did you have any trouble coming up with that many sketches?
  - Did you have trouble trying to think of very different sketches?
- What helped you break out of a rut?
- Anything else interesting you noticed while going through this process?

Group Project Overview

Reducing Disparity

- This can be broadly construed to relate to helping groups of people gain access to information, resources, support, connections, communities, opportunities, etc. that other groups may more easily access for various reasons.
- Your team must pick a user group that **you all do not consider yourself a member of**; this is so that you will not rely too much on your own experiences during user research.
- Define what the specific disparity is that you wish to help reduce for which population. Then start to consider ways technology can be designed to help address this problem. Some examples of relevant projects are in the syllabus!

LIFEAFTER

Join communities, create relationships, reclaim your life.

Problem

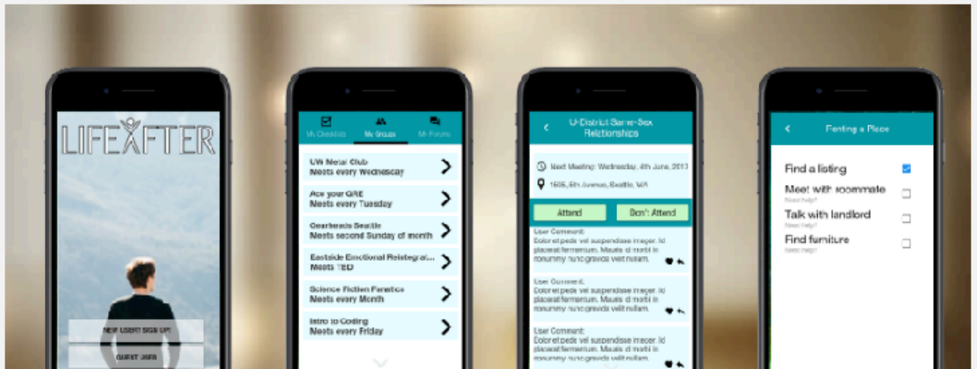
Around one percent of the US population is or has been incarcerated. When they leave, these individuals often face issues trying to reintegrate into society. They are systematically discriminated when looking for housing and employment. The highly regimented format of the prison system means that they often do not know how to do the daily tasks that many take for granted. They also often have trouble discovering the available resources.

Solution

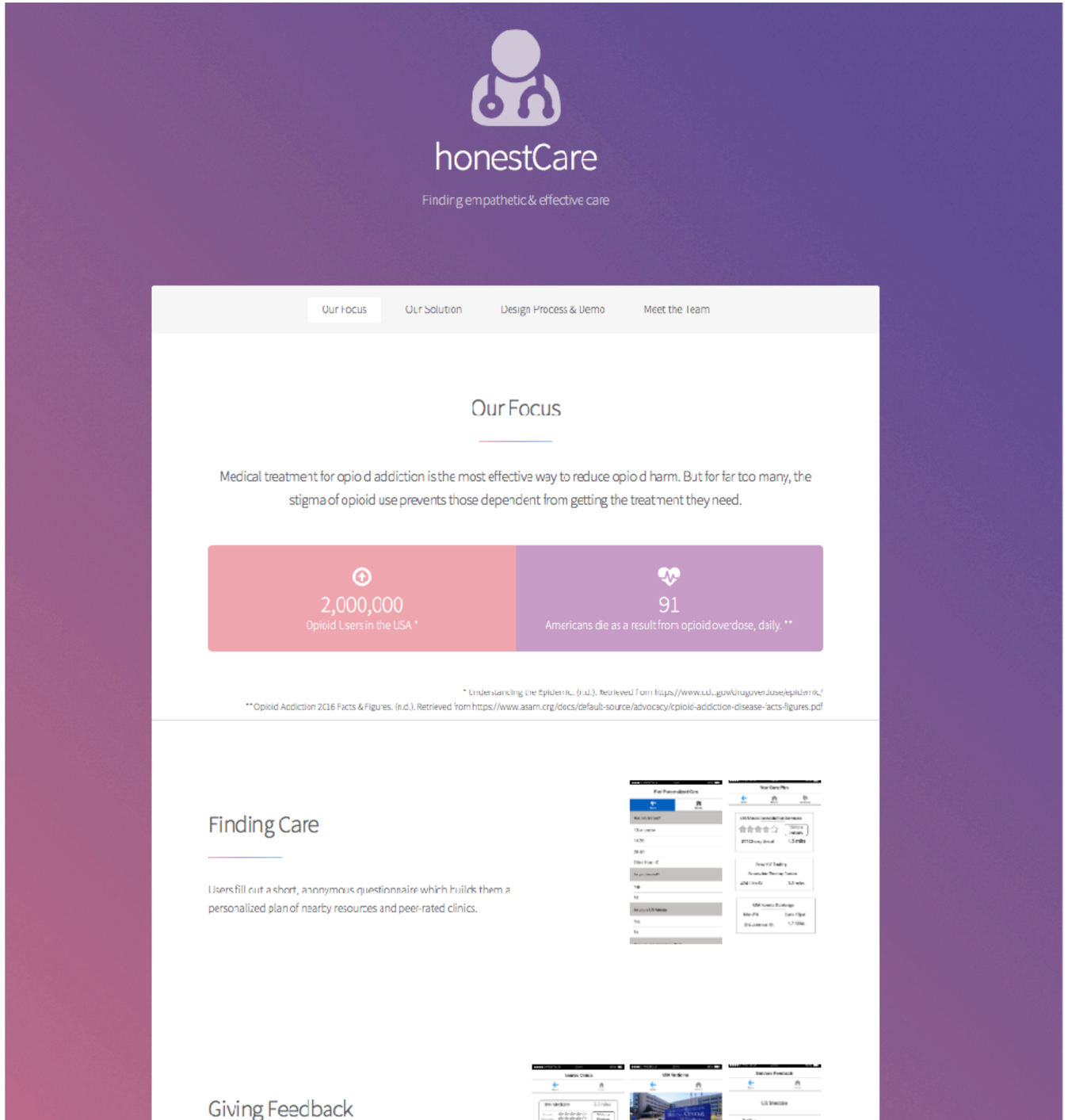
A social network called LifeAfter that connects young formerly incarcerated people to older mentors, influencers, educational organizations, NGO's and each other to create a supportive community for emotional and informational needs. This design allows users to create checklists, groups, and forums in order to answer the questions that others in similar situations might have, and to support them in their journey.

Goal

This design focuses on formerly incarcerated individuals that were jailed between the ages of 18 and 25. This demographic is disproportionately affected by disruptions to their lives, as they don't have the life skills elder people may have, and prison can be one of the worst. This project aims to design a Human Computer Interaction solution for them that provides them a sense of community they would otherwise lack.



LifeAfter
https://courses.cs.washington.edu/courses/cse440/17sp/projects/LifeAfter/



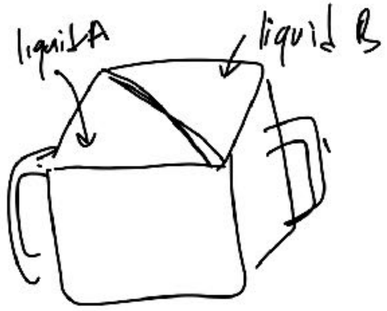
honestCare:
https://courses.cs.washington.edu/courses/cse440/17sp/projects/honestCare/

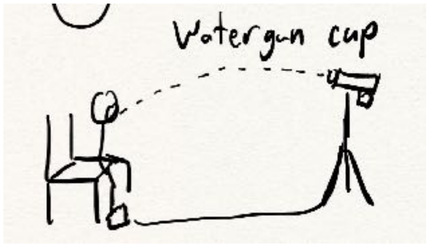
Thinking about ideas for the project

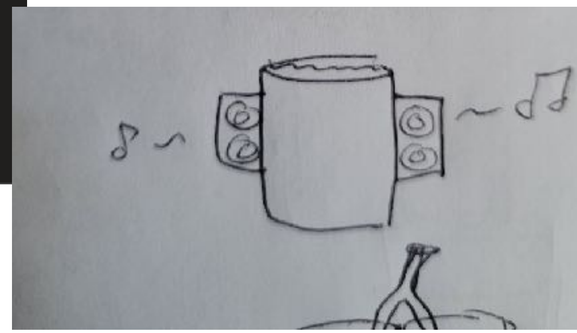
- Pick ideas that you are **passionate** about!
- The problem and the target user group should not be too vague (“people who exercise”). As mentioned, thinking of specific types of users and contexts will be helpful for customizing your design.
- But also **don’t scope it too narrowly just yet**. If you do, you may realize that you’ve narrowed it so much that you’ve already got a specific solution in mind. Try to keep an open mind at this point and look around for a weighty, complex problem with several avenues for potential exploration.

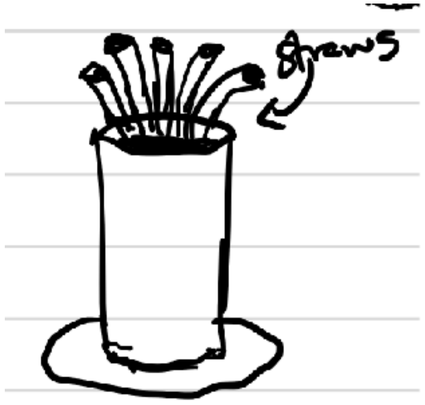
In Your Groups:

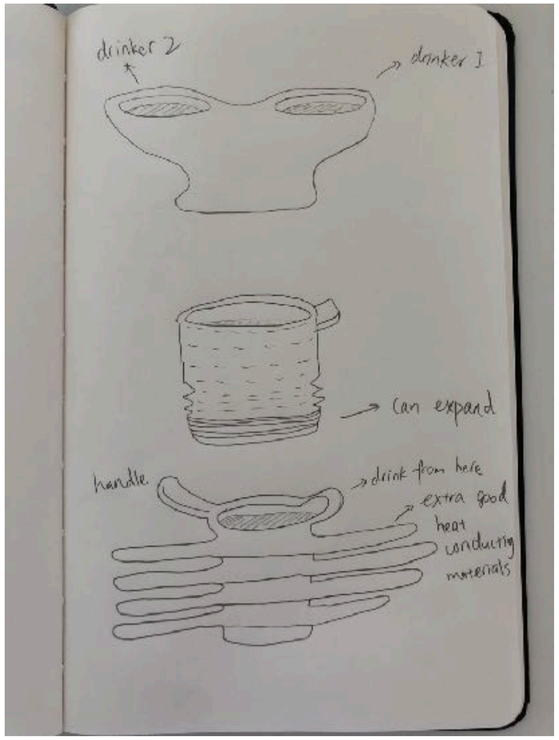
- Start with an introduction if you didn't meet each other on Tuesday
  - Name, pronouns, background, hobbies, fun facts, etc.!
- Share your 2-3 favorite cup designs. Talk about your design process, what dimensions you explored. How did you landed on these 2-3, and why are they your favorite?
- In the remaining time, exchange contact details, discuss when to meet, how to communicate.
- Use the Google Docs we've set up for your groups to write down your work as you progress: http://www.yellkey.com/rule You'll turn in your assignments as PDFs on Gradescope but **we expect you to also keep this doc up-to-date with all your assignments** (don't worry about replicating any fancy formatting in your PDF in the doc).
- You can also begin making a plan for 1a now. You'll have some time tomorrow in Section as well. The final 1a is due 5PM Friday in Gradescope!
  - A useful technique for group ideation is for teams to individually come up with a number of ideas before sharing them all with the rest of the team. Helps to reduce groupthink and improves the creativity of output (making a bigger diamond before narrowing!)

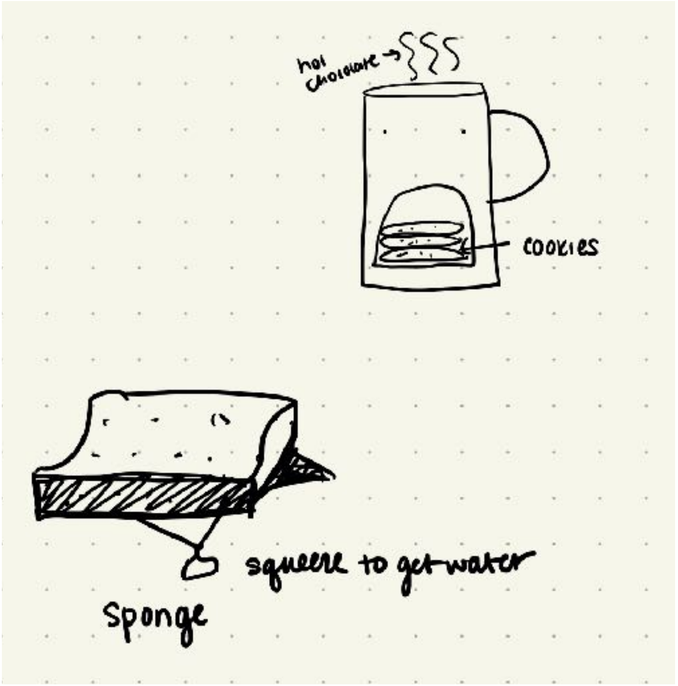












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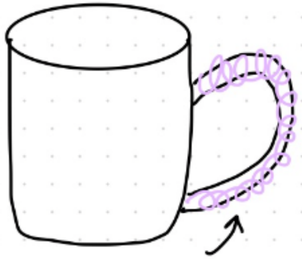

Some interesting cup ideas people came up with!