CSE 440: Introduction to HCI

User Interface Design, Prototyping, and Evaluation

Lecture 05:
Design Diamond

James Fogarty

Eunice Jun

David Wang
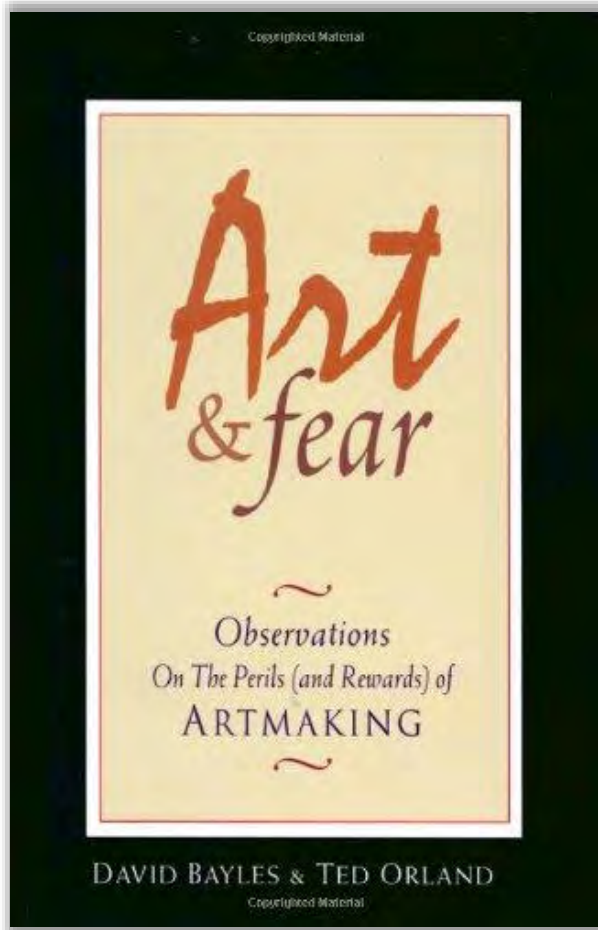
Elisabeth Chin

Ravi Karkar

Tuesday / Thursday
10:30 to 11:50

DESIGN
USE
BUILD

Quantity versus Quality

One class told they will be graded on quality, another on quantity

Bayles and Orland, 2001

Quantity versus Quality

The quantity class produces better pots. Why?

Bayles and Orland, 2001
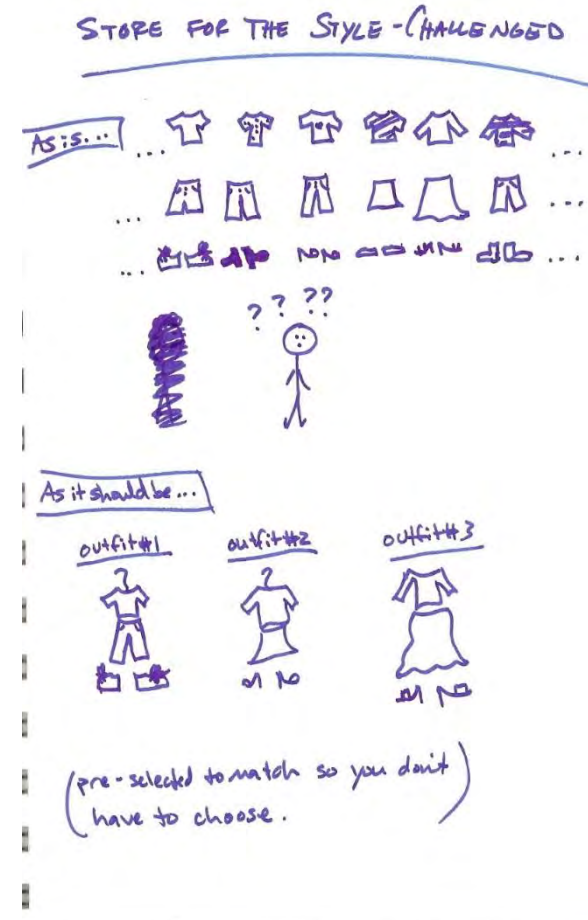
Quantity versus Quality

The quantity class produces better pots. Why?

"While the quantity group was busily churning out piles of work—and learning from their mistakes—the quality group had sat theorizing about perfection, and in the end had little more to show for their efforts than grandiose theories and a pile of dead clay"
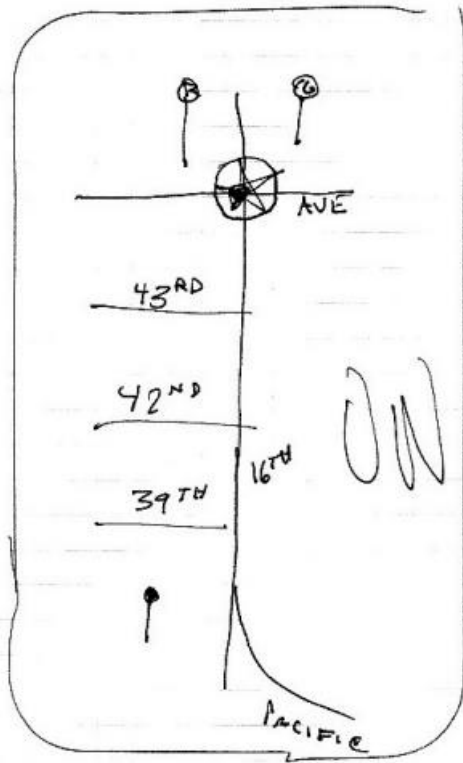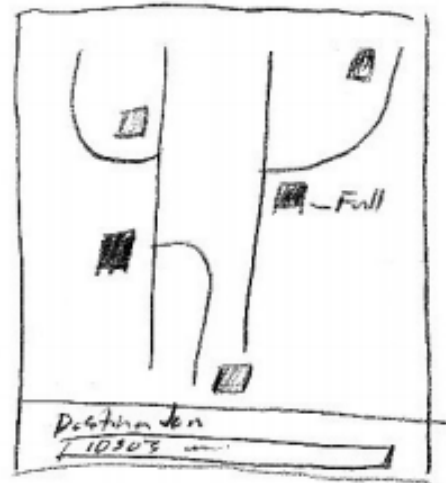
Bayles and Orland, 2001

Sketching User Experiences

"Bill Buxton brings design leadership and creativity to Microsoft. Through his thought-provoking personal examples he is inspiring others to better understand the role of design in their own companies."

Bill Gates—Chairman, Microsoft Corp.

Sketching User Experiences

getting the design right and the right design

Bill Buxton

Sketching

Sketching

Sketching

Sketching

UBIQITOUS RICE COOKER

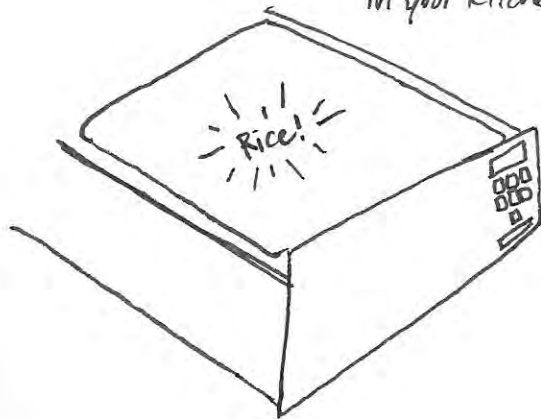LCD display shows number of cups & time remaining

pad for cups of rice input
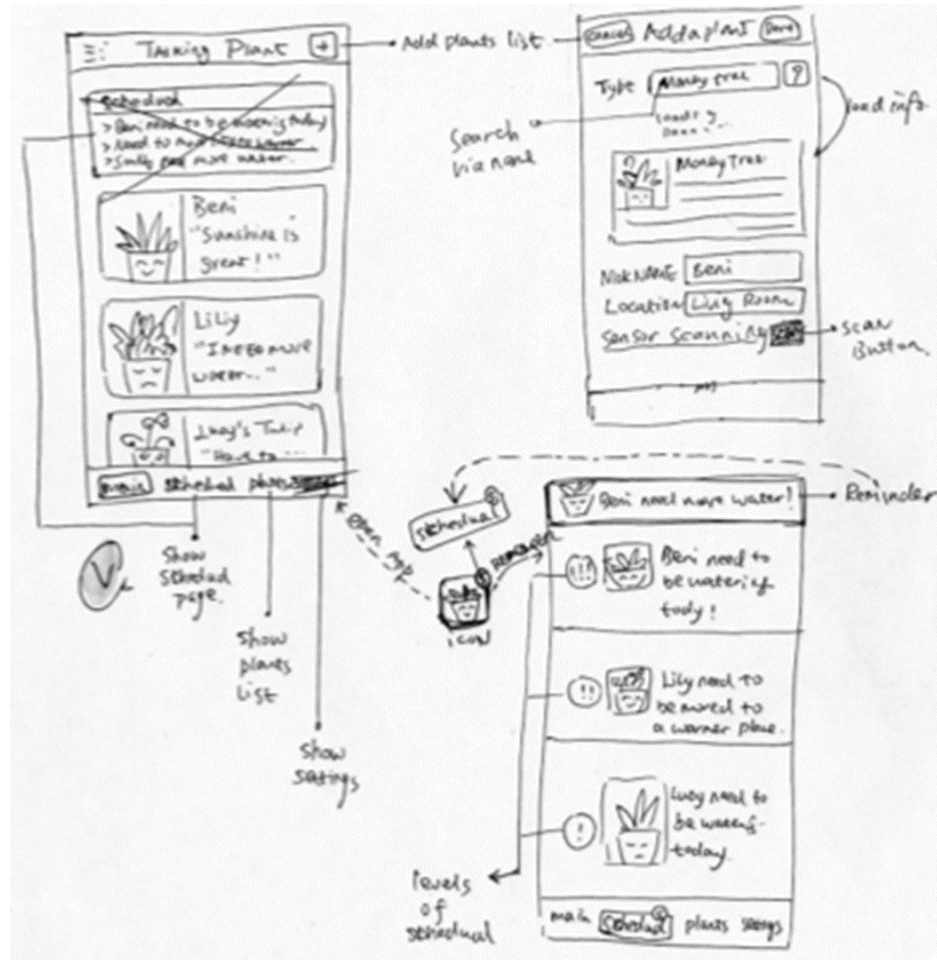
eject button opens drawer
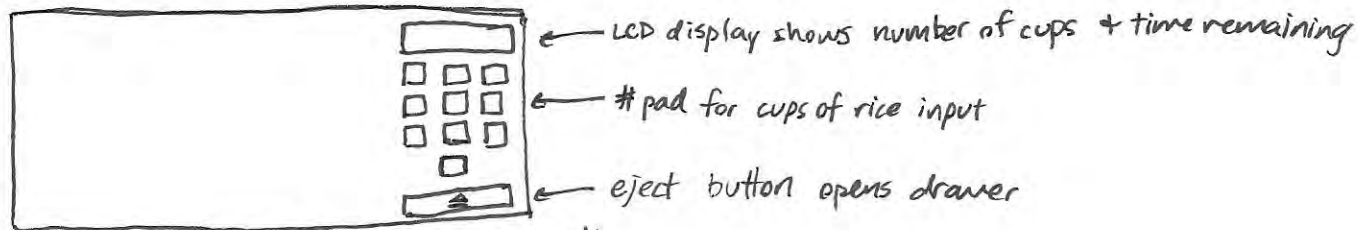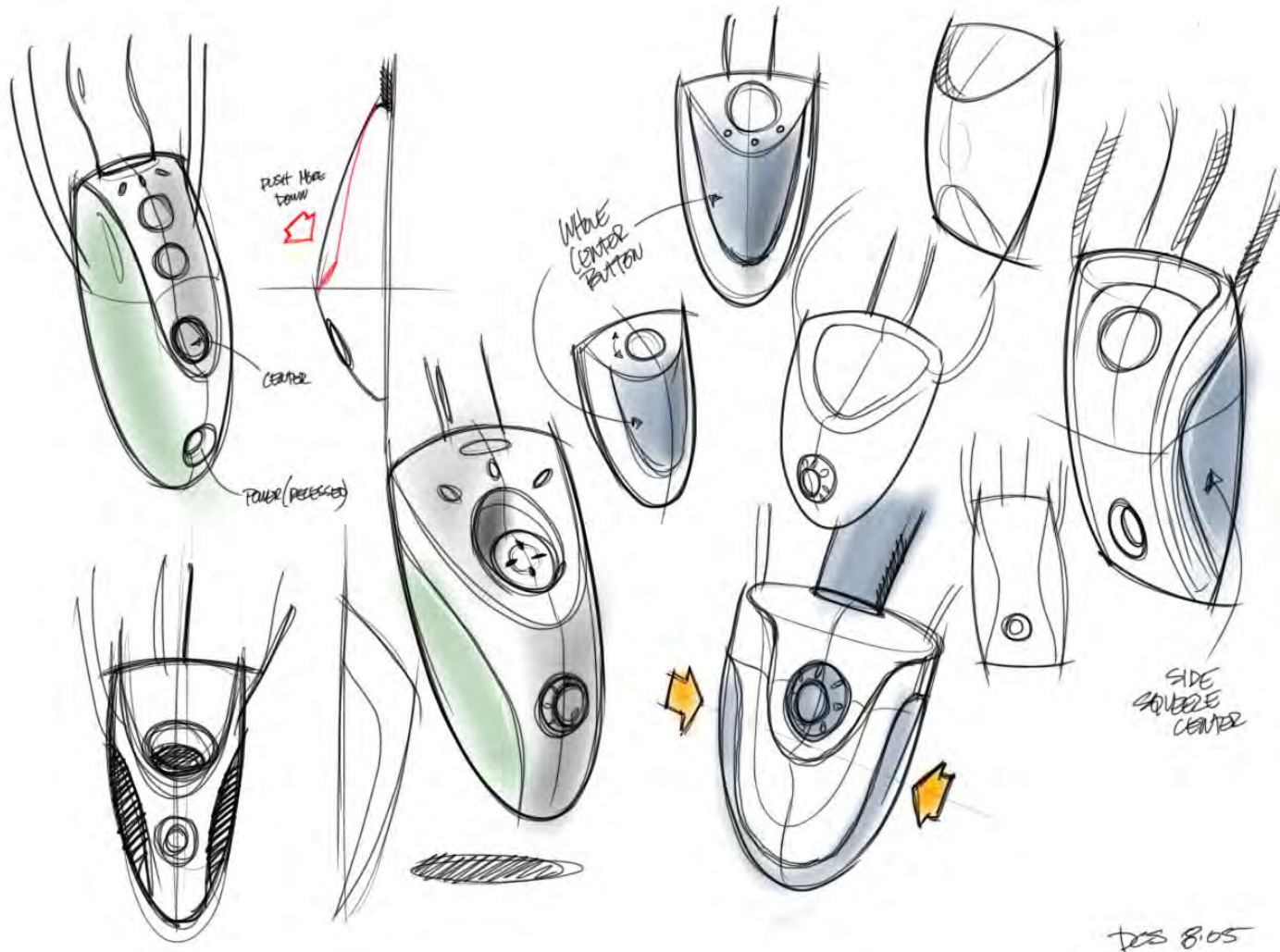
"Just another drawer" in your kitchen

Rice!

The uncooked rice is stored in a hidden reservoir. Water is acquired through a hose attached to your water source (similar to an espresso machine).

Sketching

A process that enables you to
    think through ideas and
    convey design ideas to others
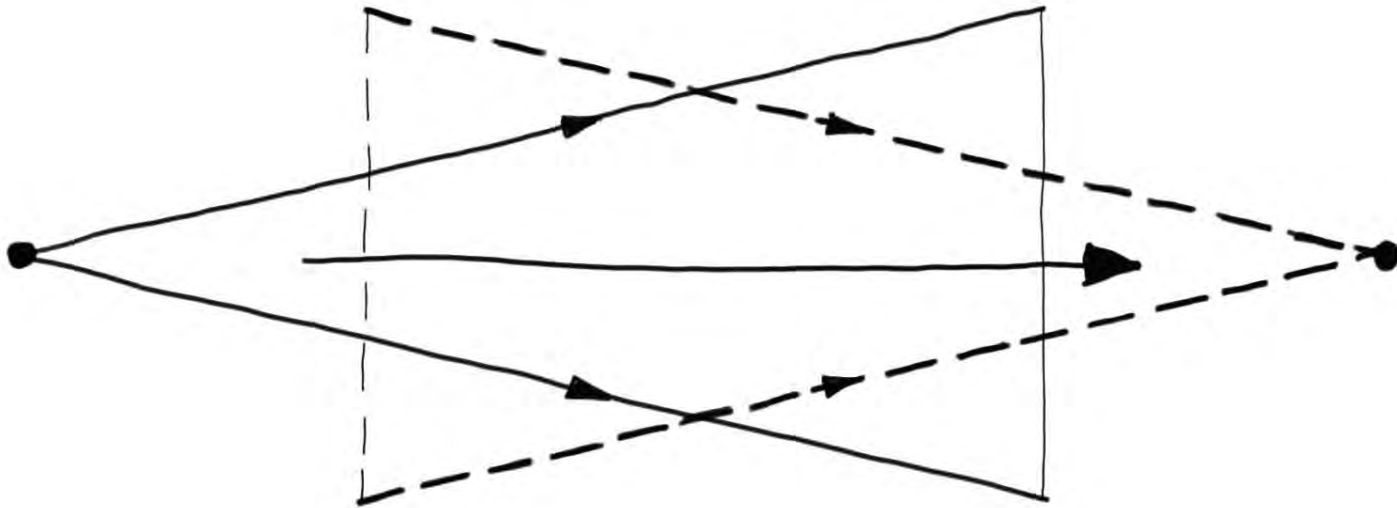   very early in the design phase

Quintessential Activity of Design

Design as Choice

Elaboration

palette of choices

Reduction

heuristics to choose
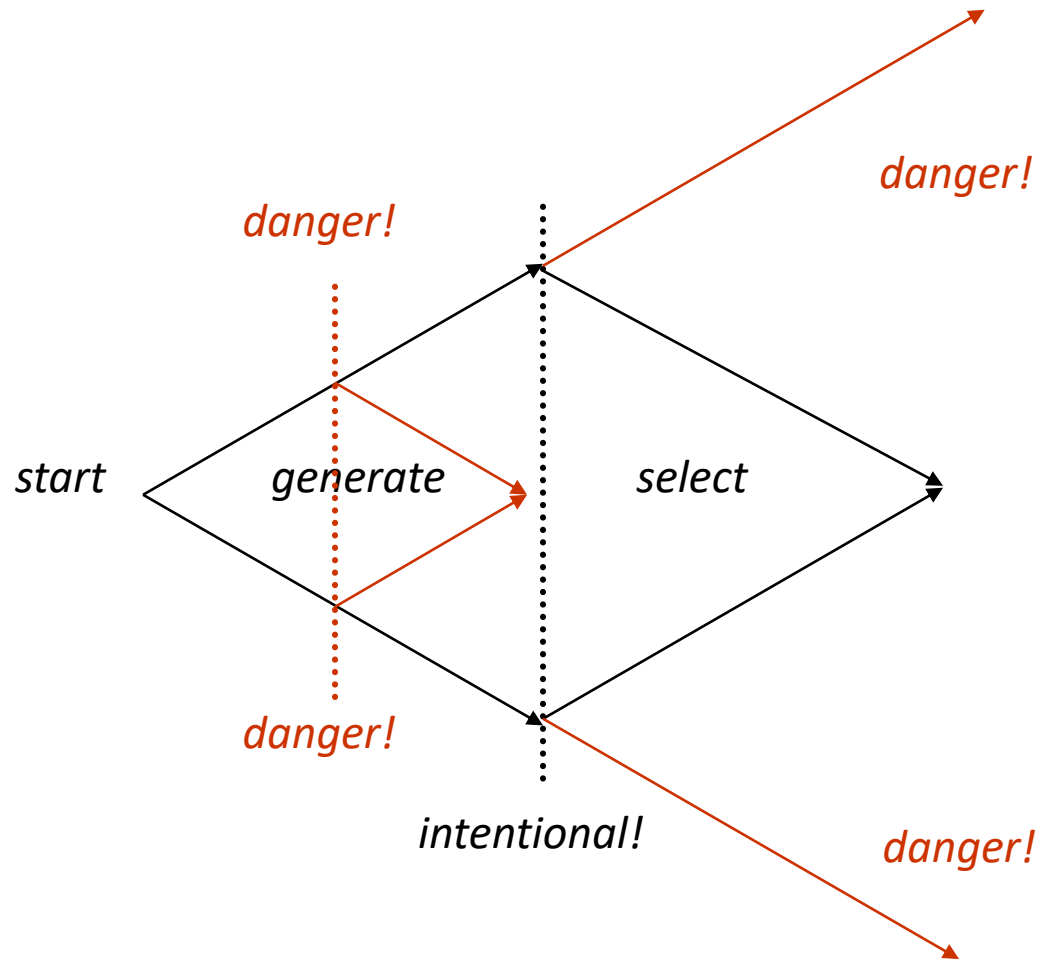
Design as Choice

Two openings for creativity

Palette of choices

Heuristics used to choose

Why is your design research so important?

What you learn directly informs both of these, shaping everything you do this entire quarter

The Design Diamond

Properties of Sketches

Quick

Timely

Inexpensive

Disposable

Plentiful

Clear Vocabulary
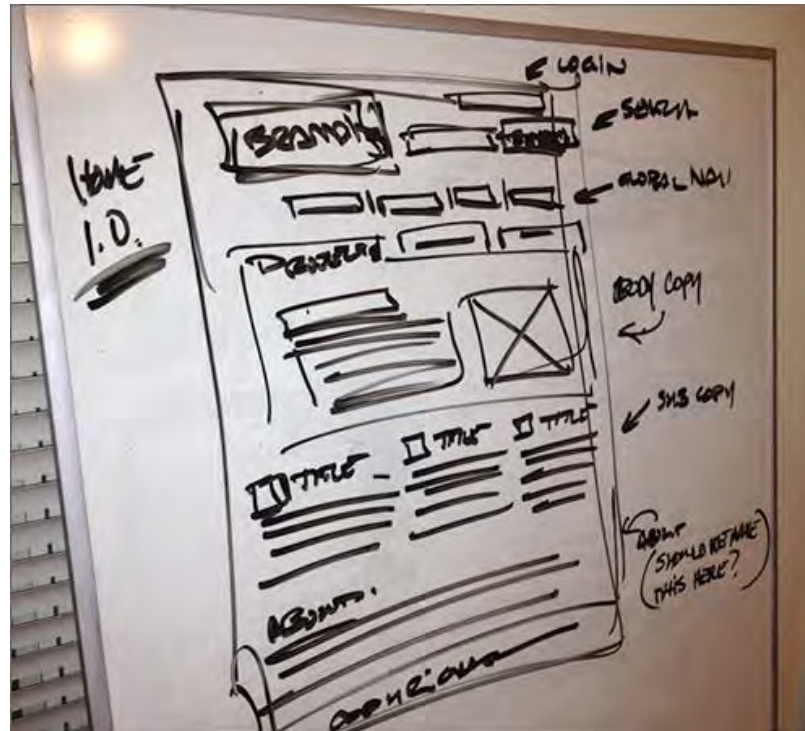
Distinct Gesture

Minimal Detail
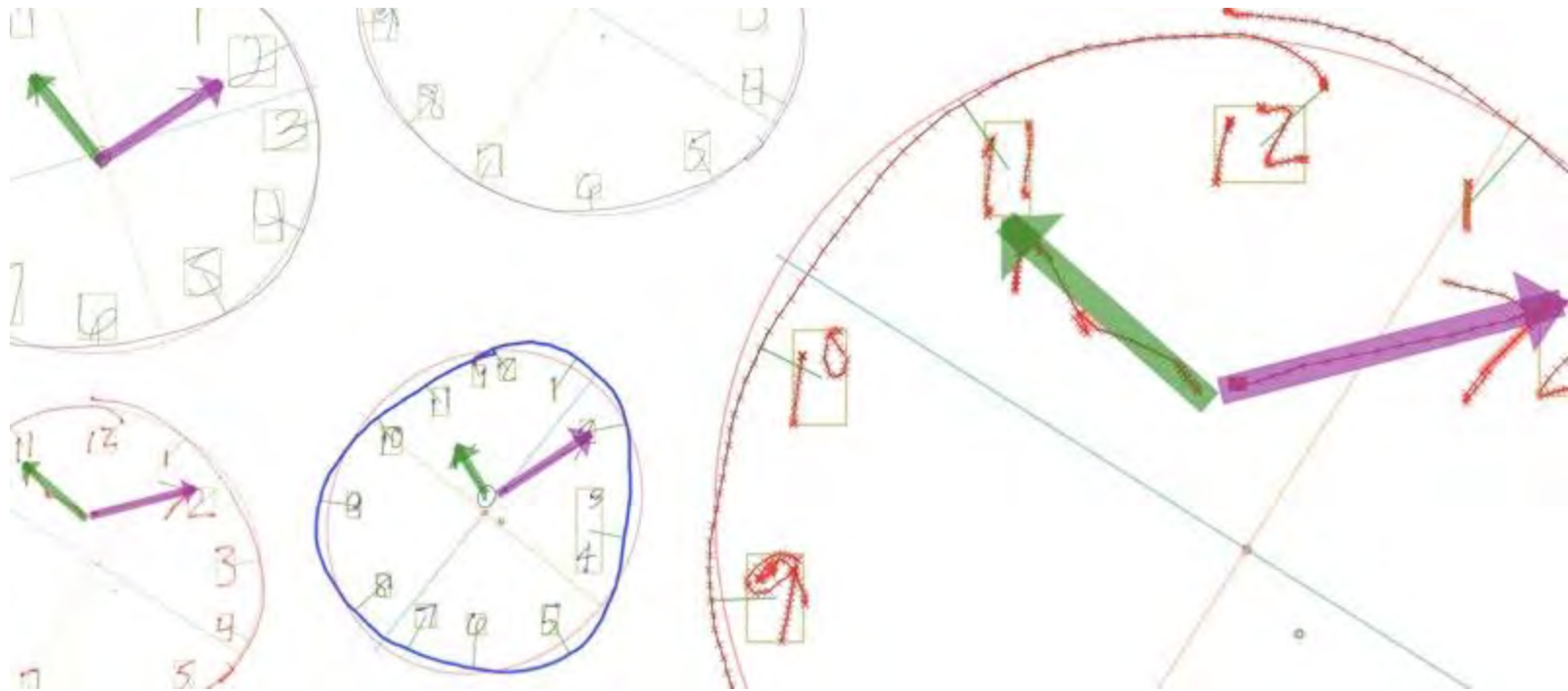
Appropriate Refinement

Suggest and Explore

Ambiguous

Quick

A sketch is quick to make,
or at least gives that impression

Timely

A sketch can be provided when needed

Inexpensive

Cost must not inhibit the ability to explore a concept, especially early in design

Disposable

If you cannot afford to throw it away,
then it is not a sketch

Investment is in the process,
not the physical sketch

But they are not "worthless"

Plentiful

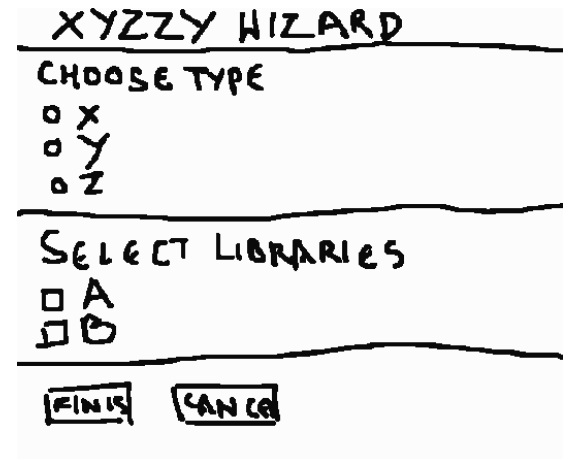Sketches do not exist in isolation

Meaning and relevance is in the context of a collection or series

Clear Vocabulary

The way it is rendered makes it distinctive that it is a sketch (e.g., style, form, signals)

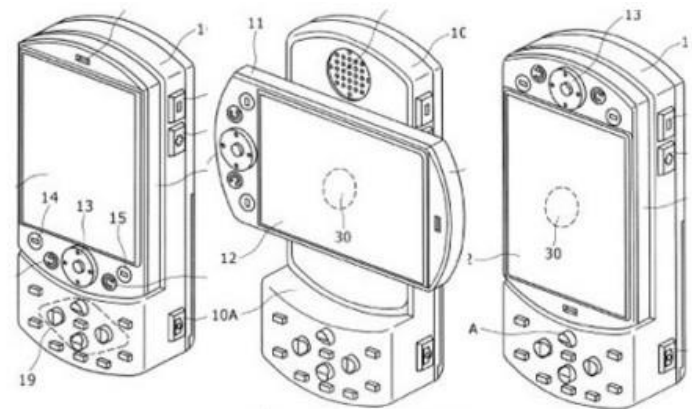Could be how a line extends through endpoints

Physical sketches have their own vocabulary

Distinct Gesture

Fluidity of sketches gives them
a sense of openness and freedom
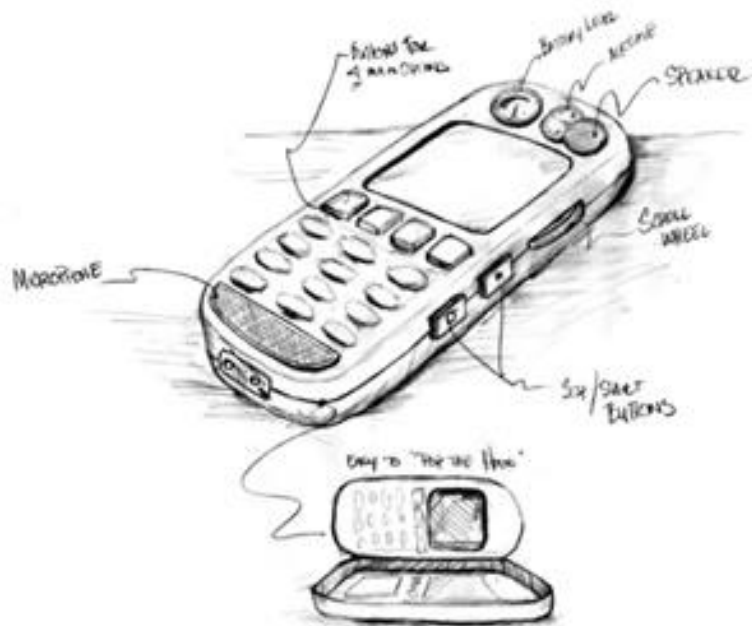
Opposite of engineering drawing,
which is tight and precise
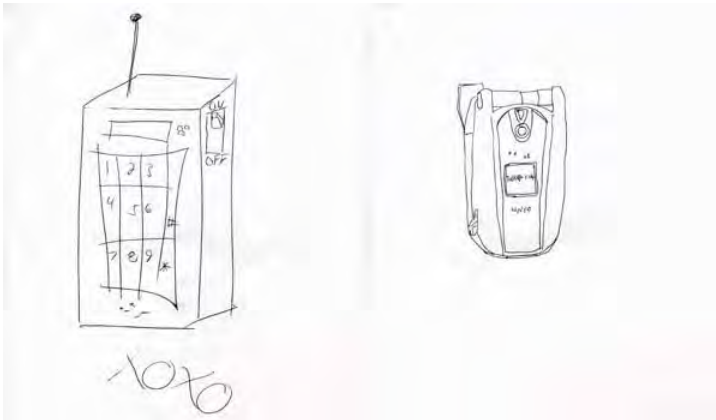
vs.

Minimal Detail

Include only what is required
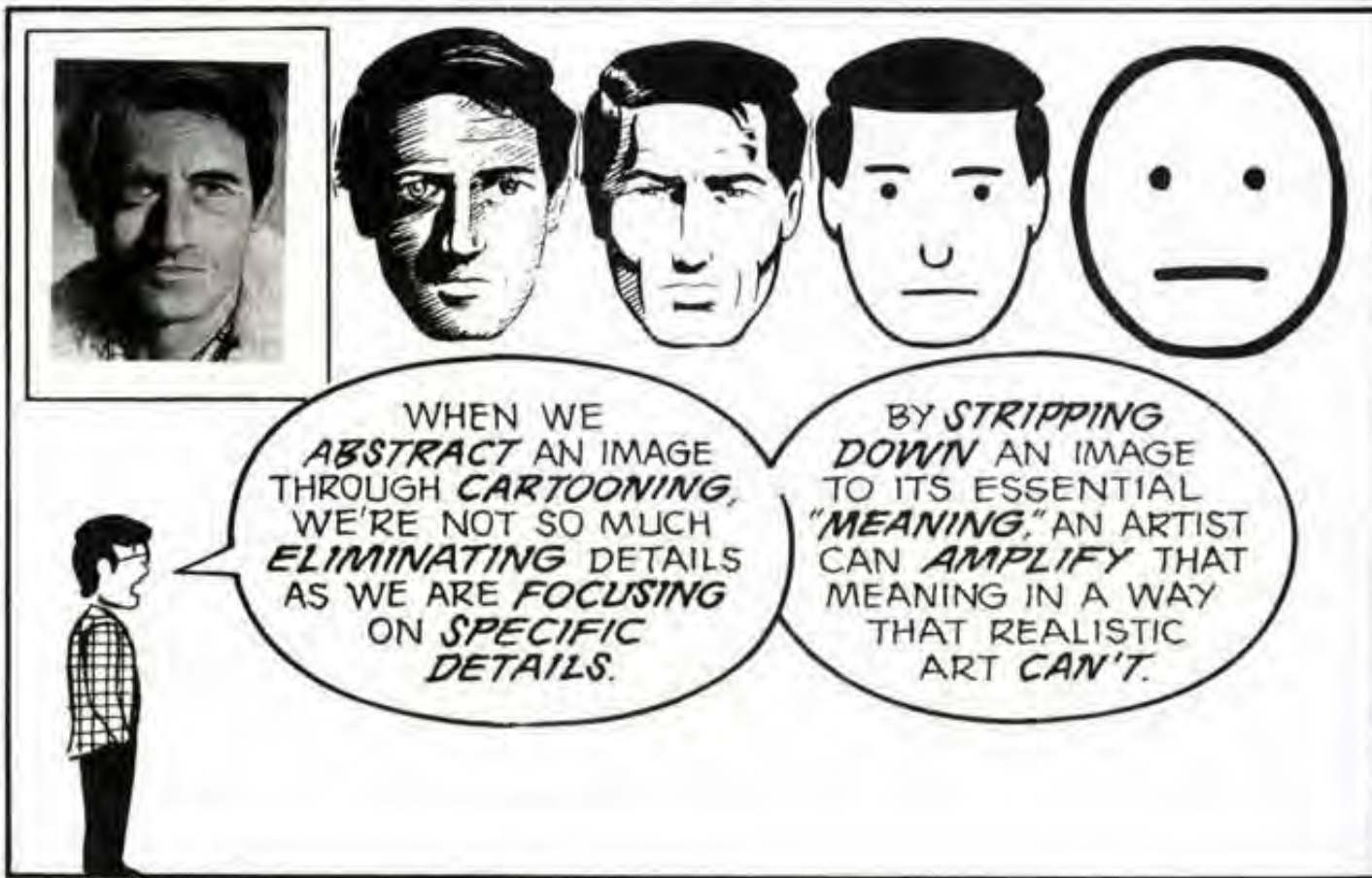to render the intended purpose or concept
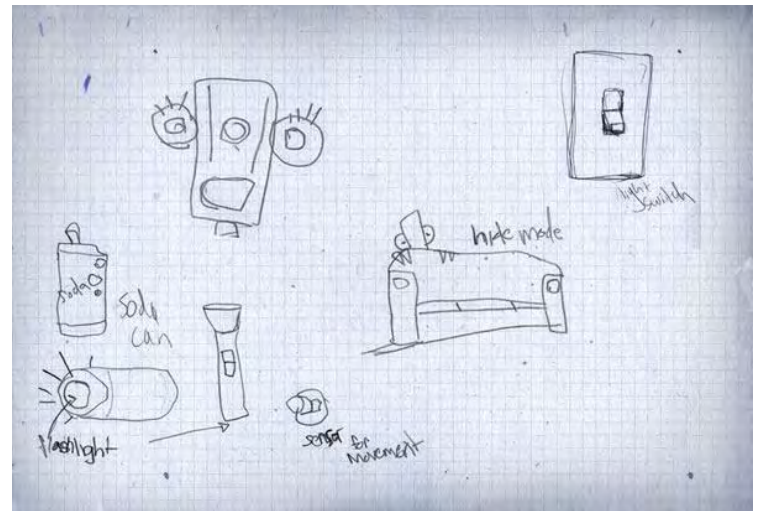
Minimal Detail

Appropriate Degree of Refinement

Make the sketch as refined as the idea

If you have a solid idea, make the sketch look more defined

If you have a hazy idea, make the sketch look rougher and less defined

Suggest and Explore Rather than Confirm

Sketch should act as a catalyst
to the desired and appropriate behaviors,
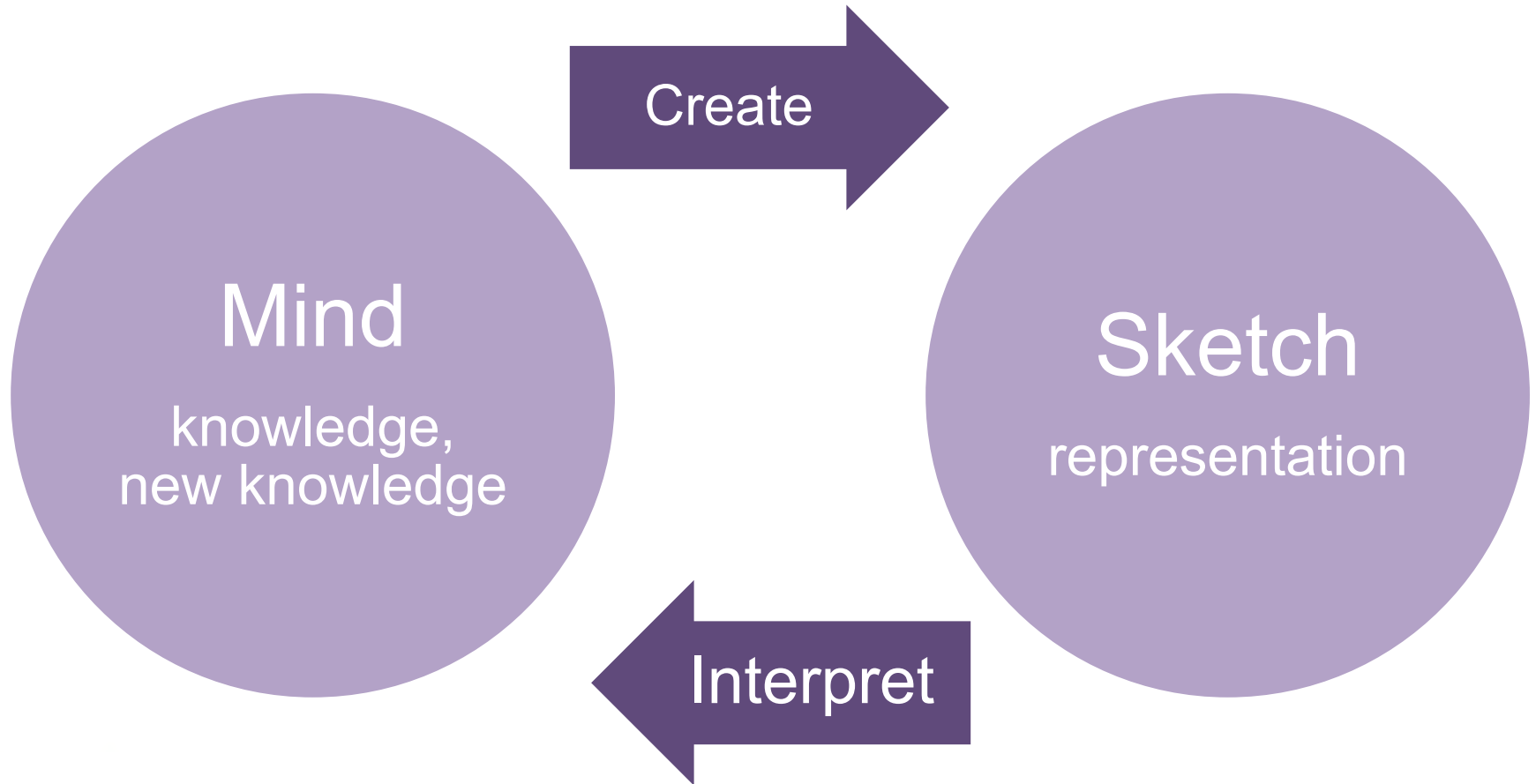conversations, and interactions

Ambiguity

Intentionally ambiguous

Value comes from being
able to be interpreted
in different ways, even by
the person who created them

Sketches have holes

Sketching as Conversation

Sketch vs. Prototype

Sketch	Prototype
Invite	Attend
Suggest	Describe
Explore	Refine
Question	Answer
Propose	Test
Provoke	Resolve
Tentative, non committal	Specific Depiction

The primary differences are in the intent

ABC News and IDEO's Deep Dive
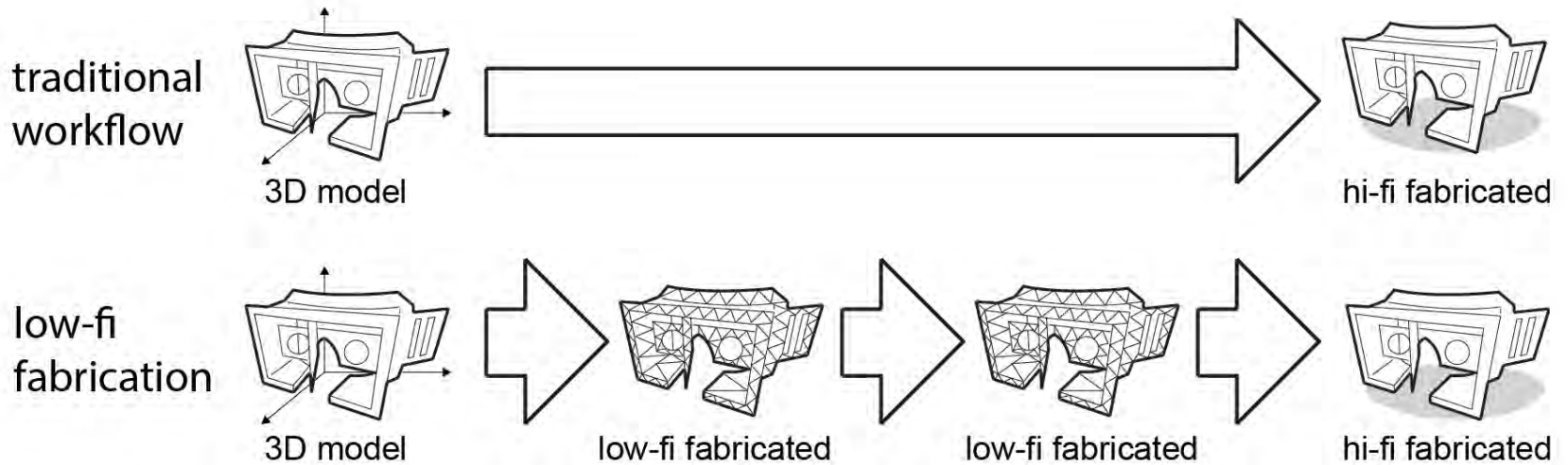
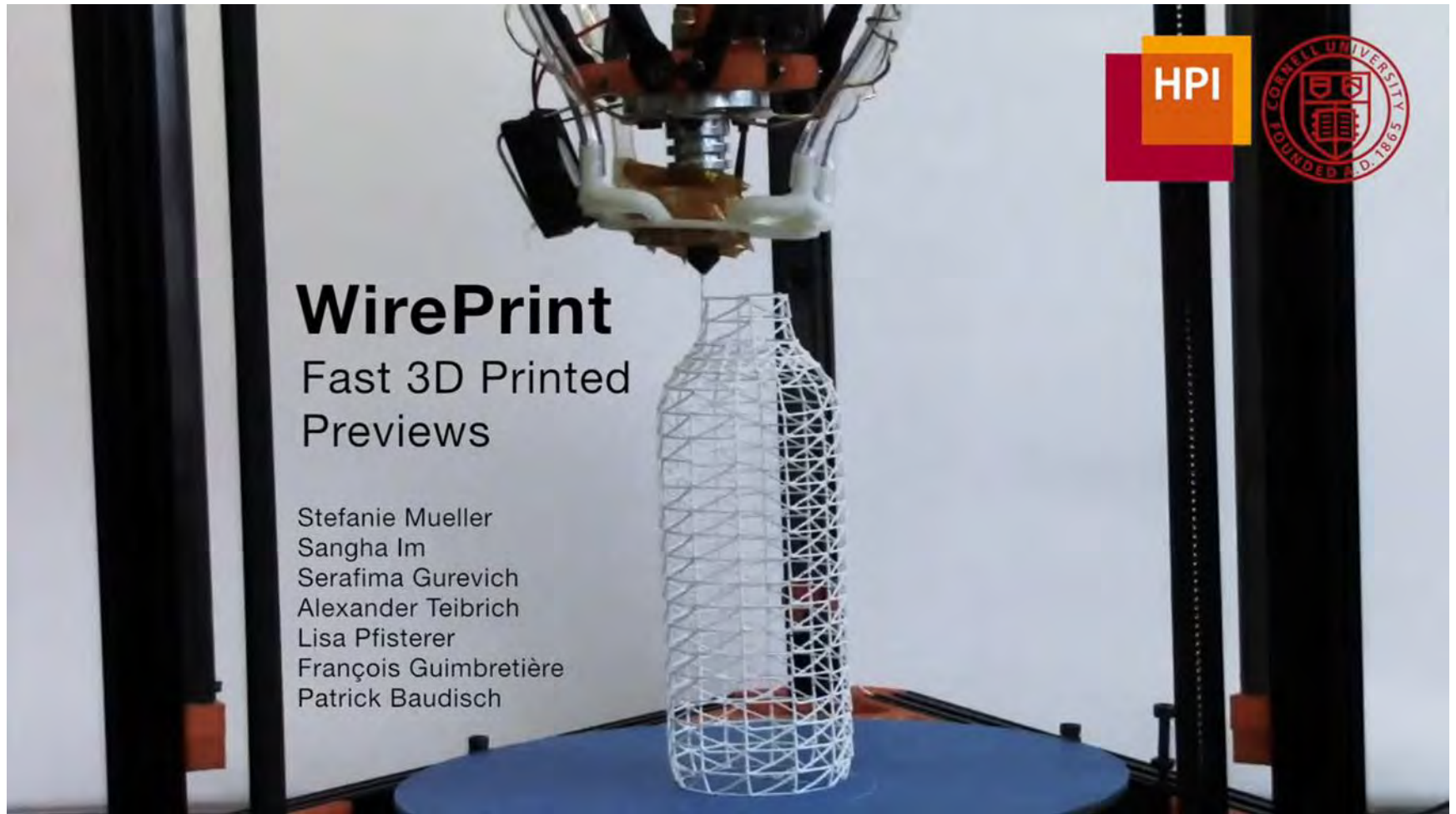# Sketching the Mouse

Sketching the Mouse

Physical Sketching

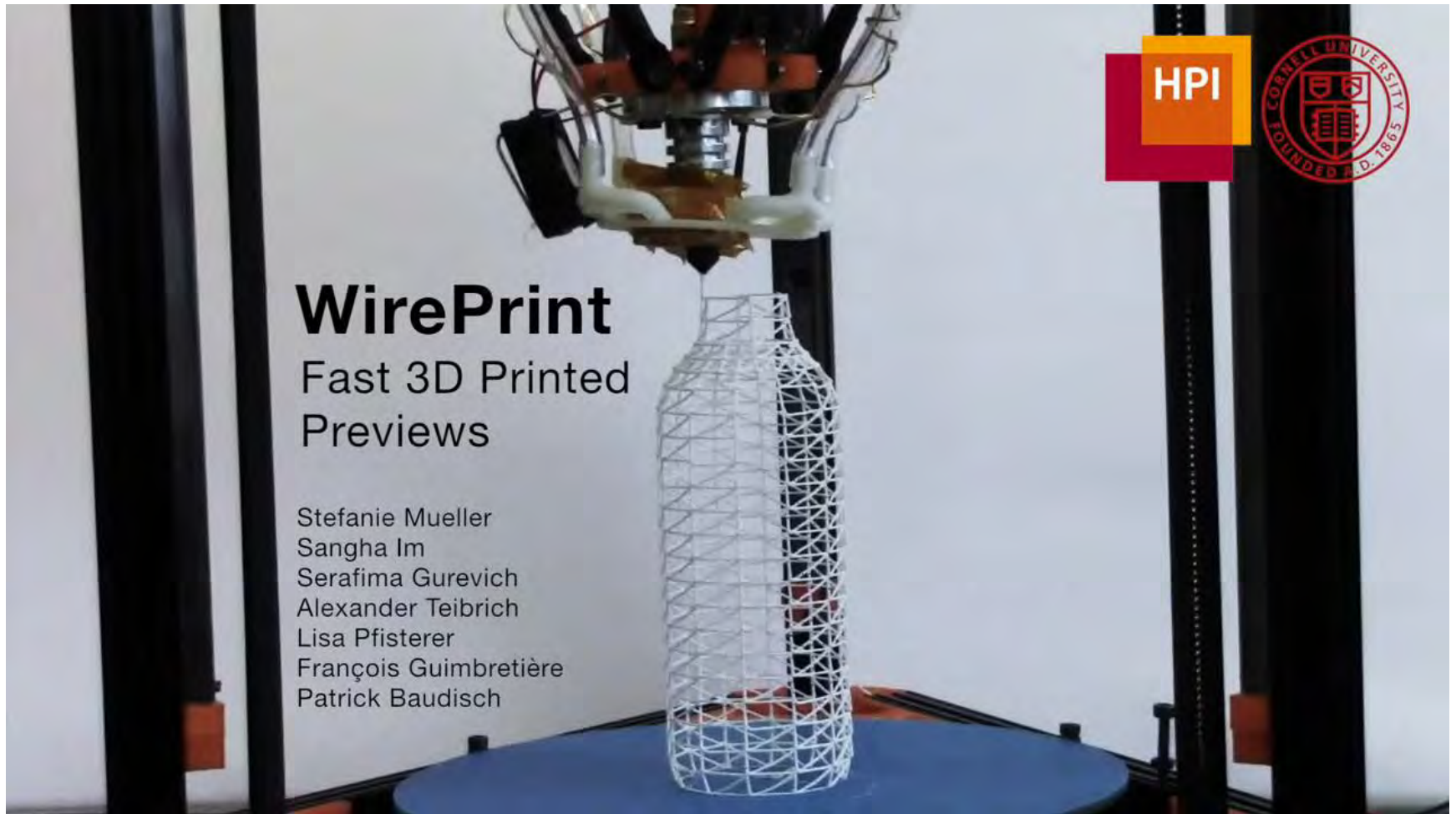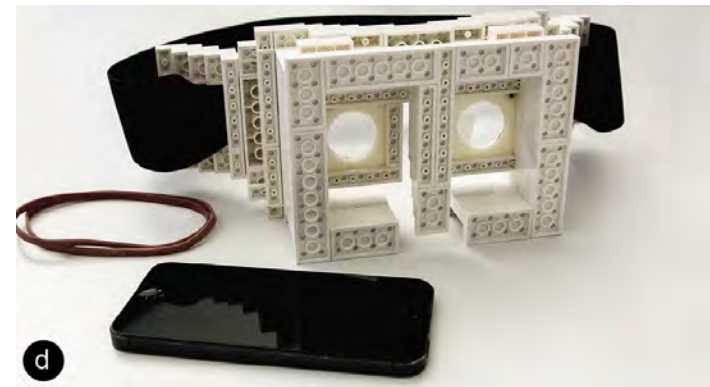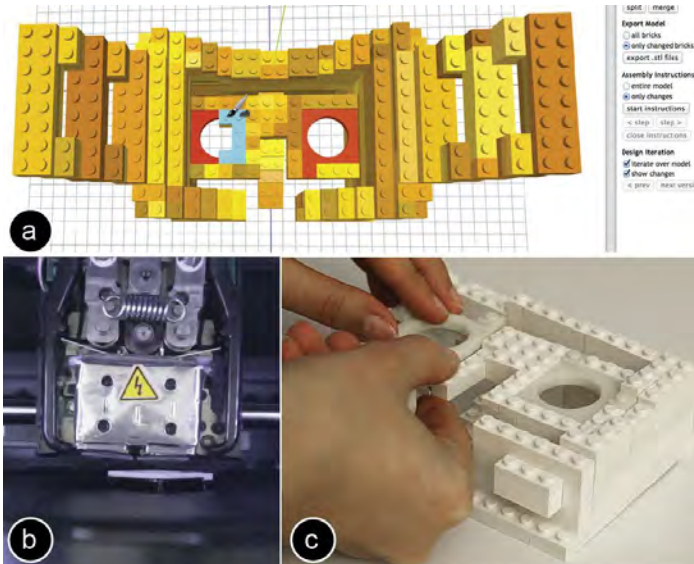# Physical Sketching
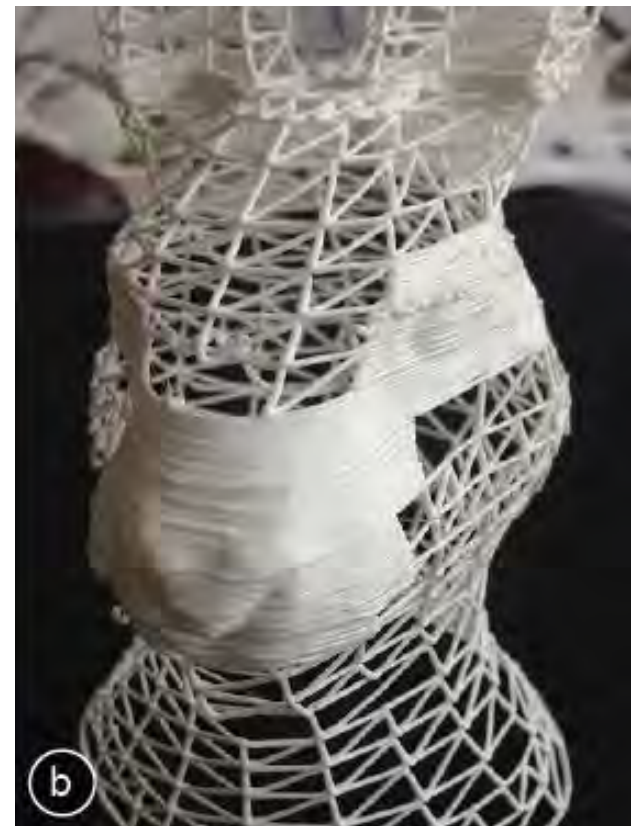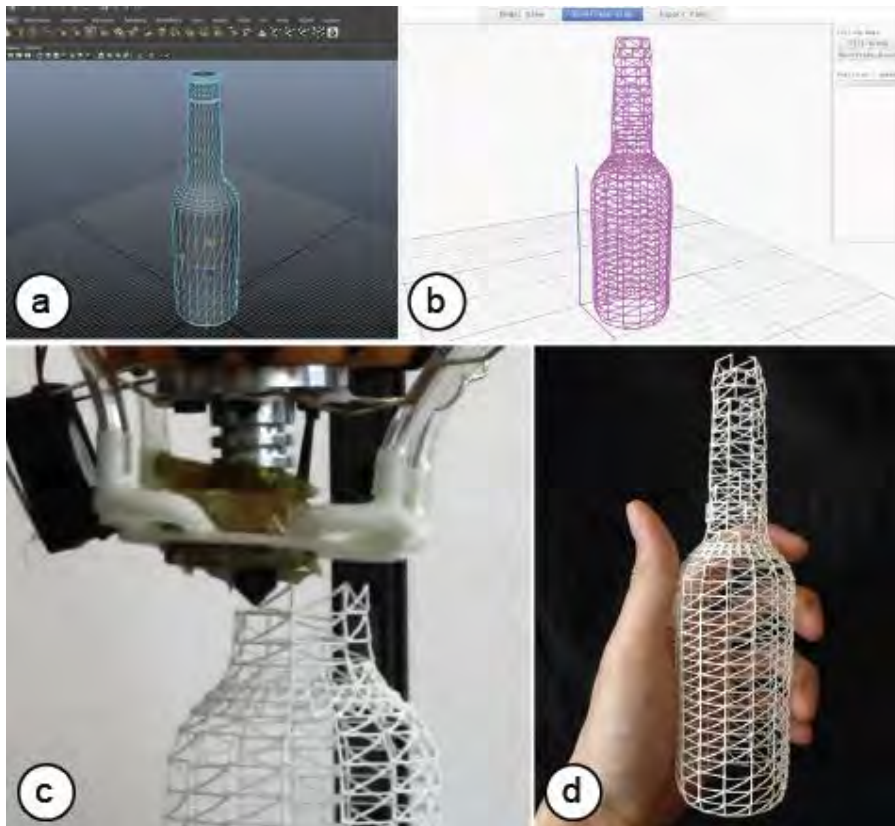
Physical Sketching

WirePrint (2014)

WirePrint (2014)

Physical Sketching

faBrickation (2014)

faBrickation (2014)

faBrickation

Stefanie Mueller, Tobias Mohr, Kerstin Guenther,
Johannes Frohnhofen, Patrick Baudisch

Physical Sketching

camera

laser pointer

laser cutter

a

b

c

d

Constructable (2012)

Mueller, Constructable, CHI 2012

Constructable (2012)

Mueller, Constructable, CHI 2012

The Design Diamond

danger!

danger!

start

generate

select

danger!

intentional!

danger!
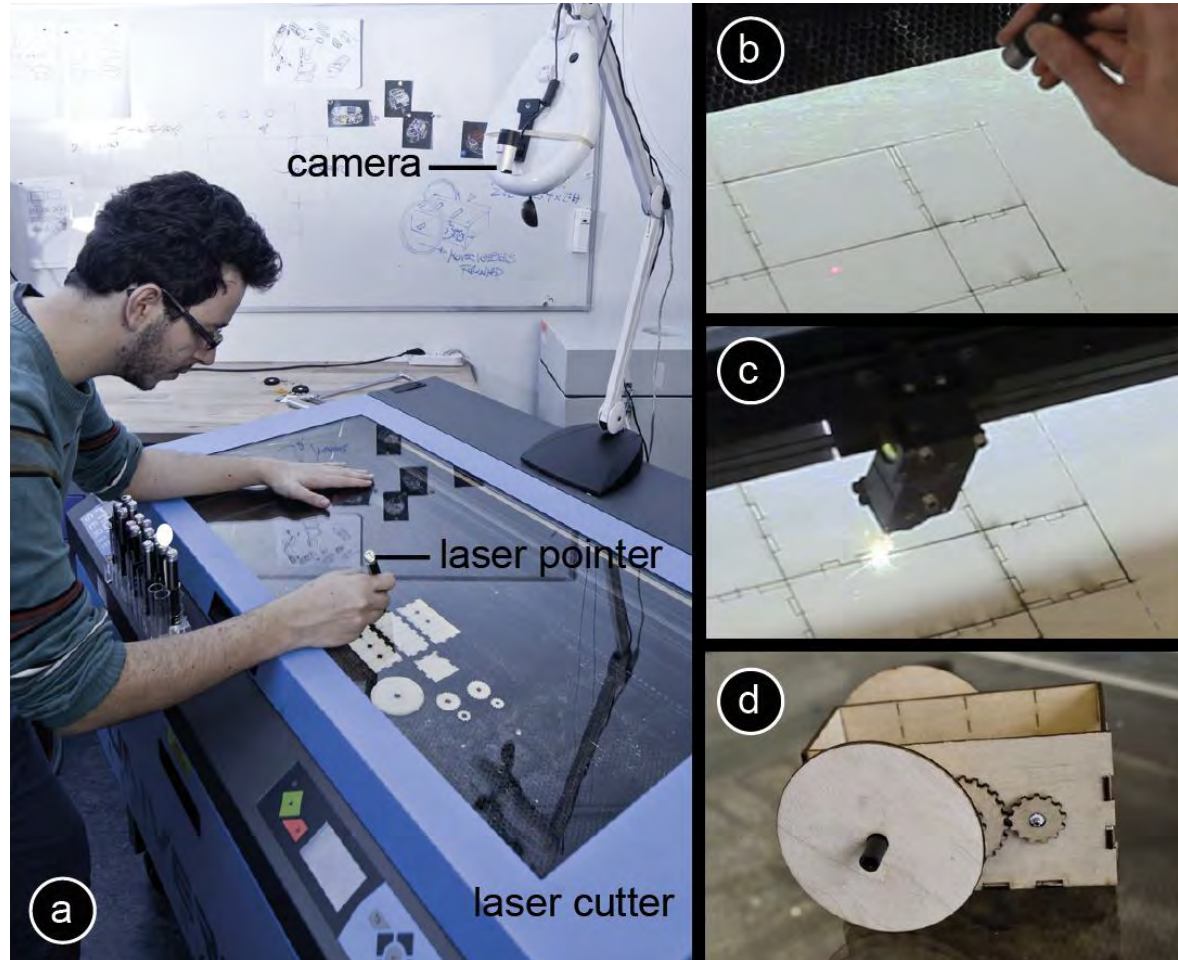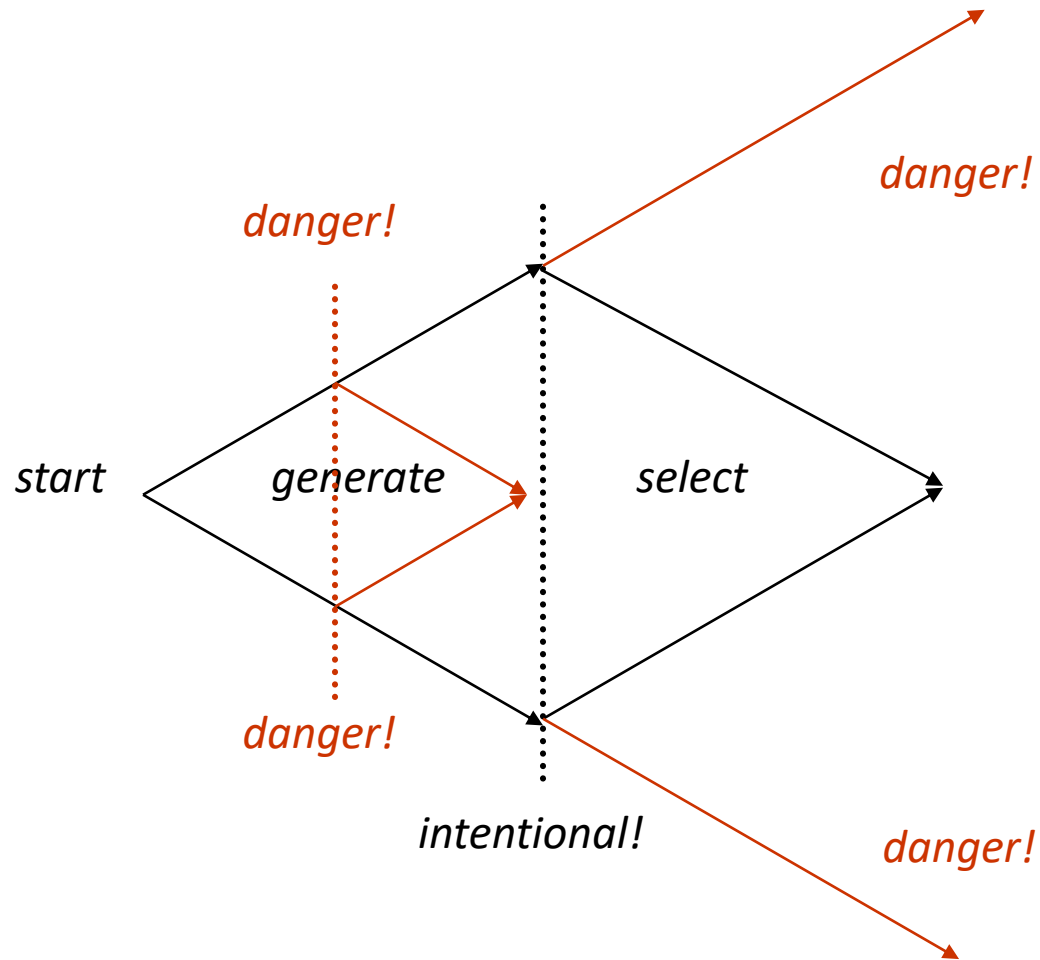
Idea Oscillation
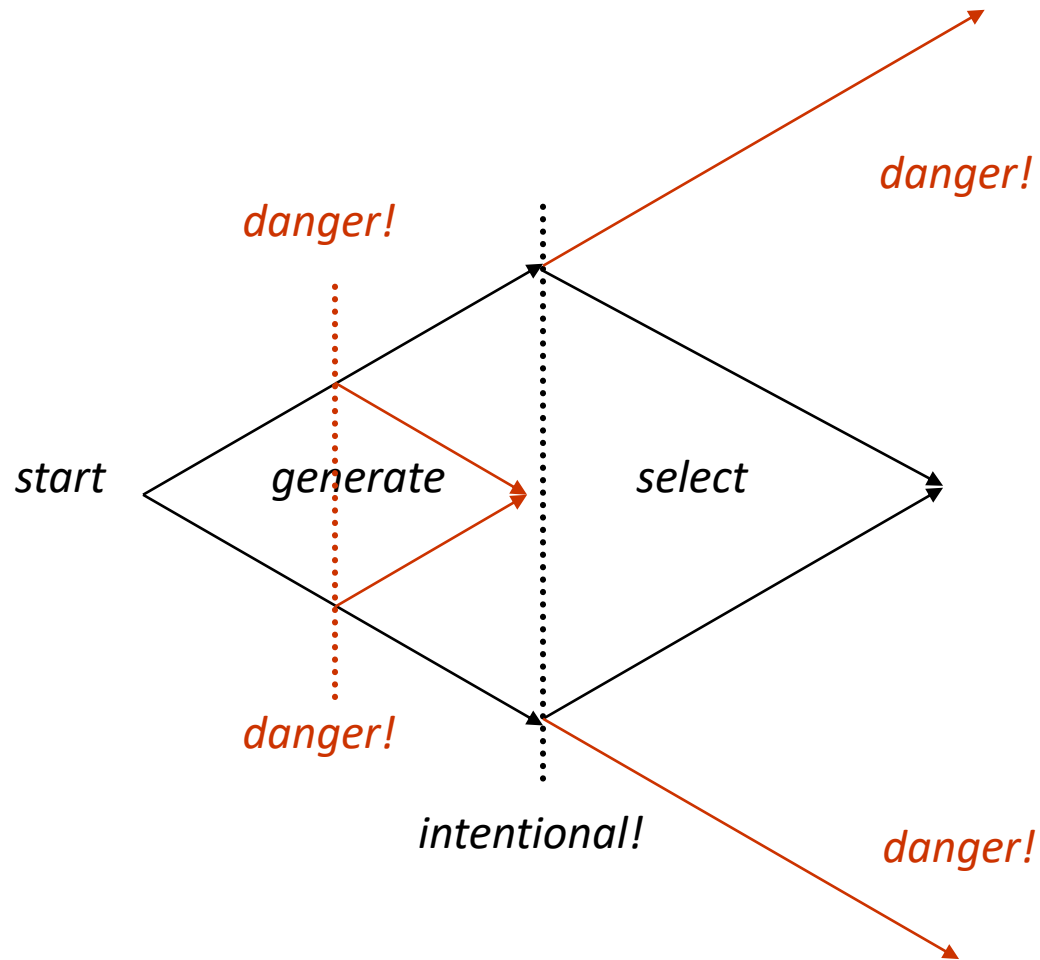
Critiquing Sketches is Important

Ideas are both good and bad

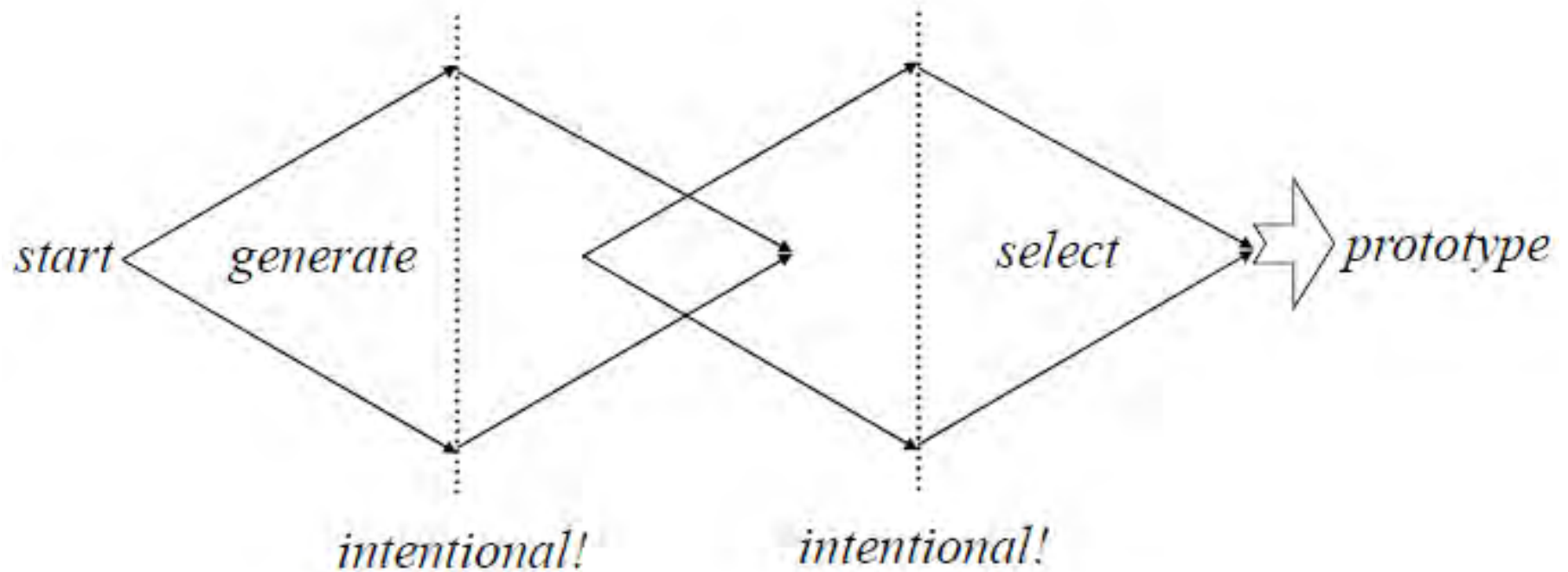   Both are useful in design

    By making clear what is a bad design,
we can avoid actually implementing it

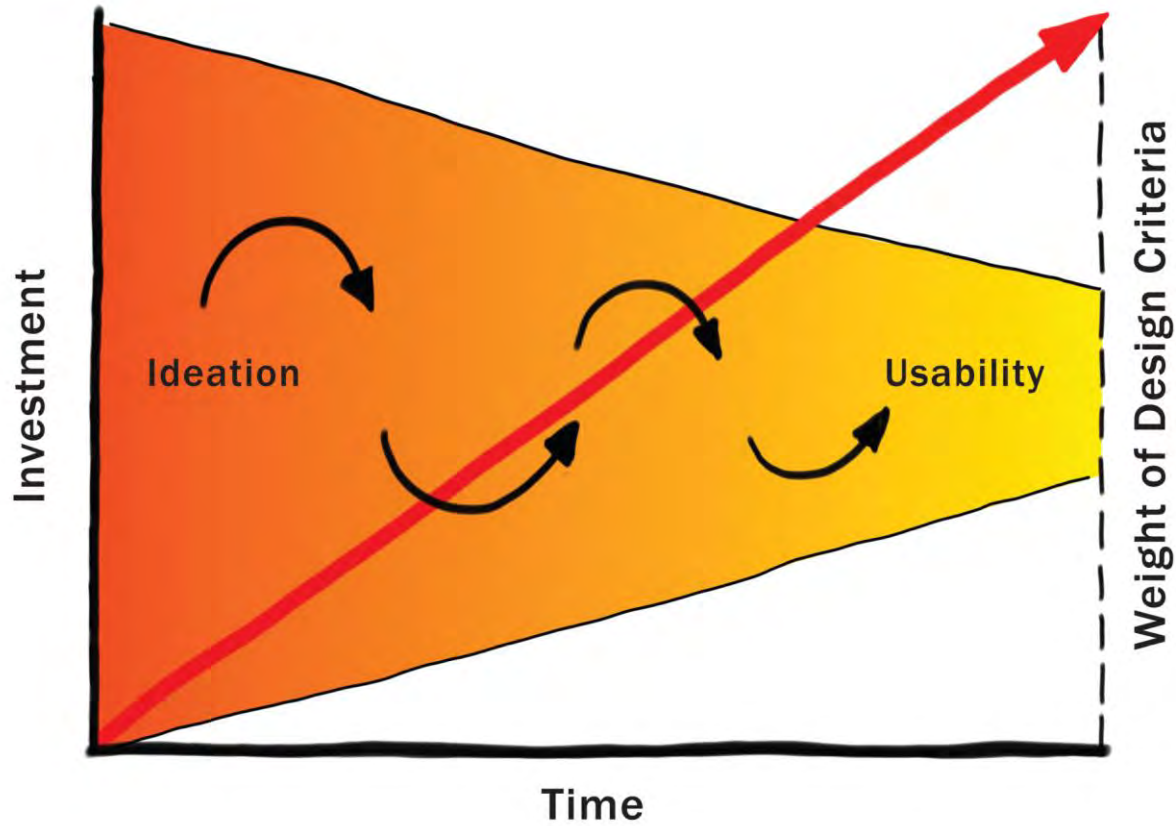   Bad ideas help you justify your good ideas

Feedback can turn a good idea into a great idea

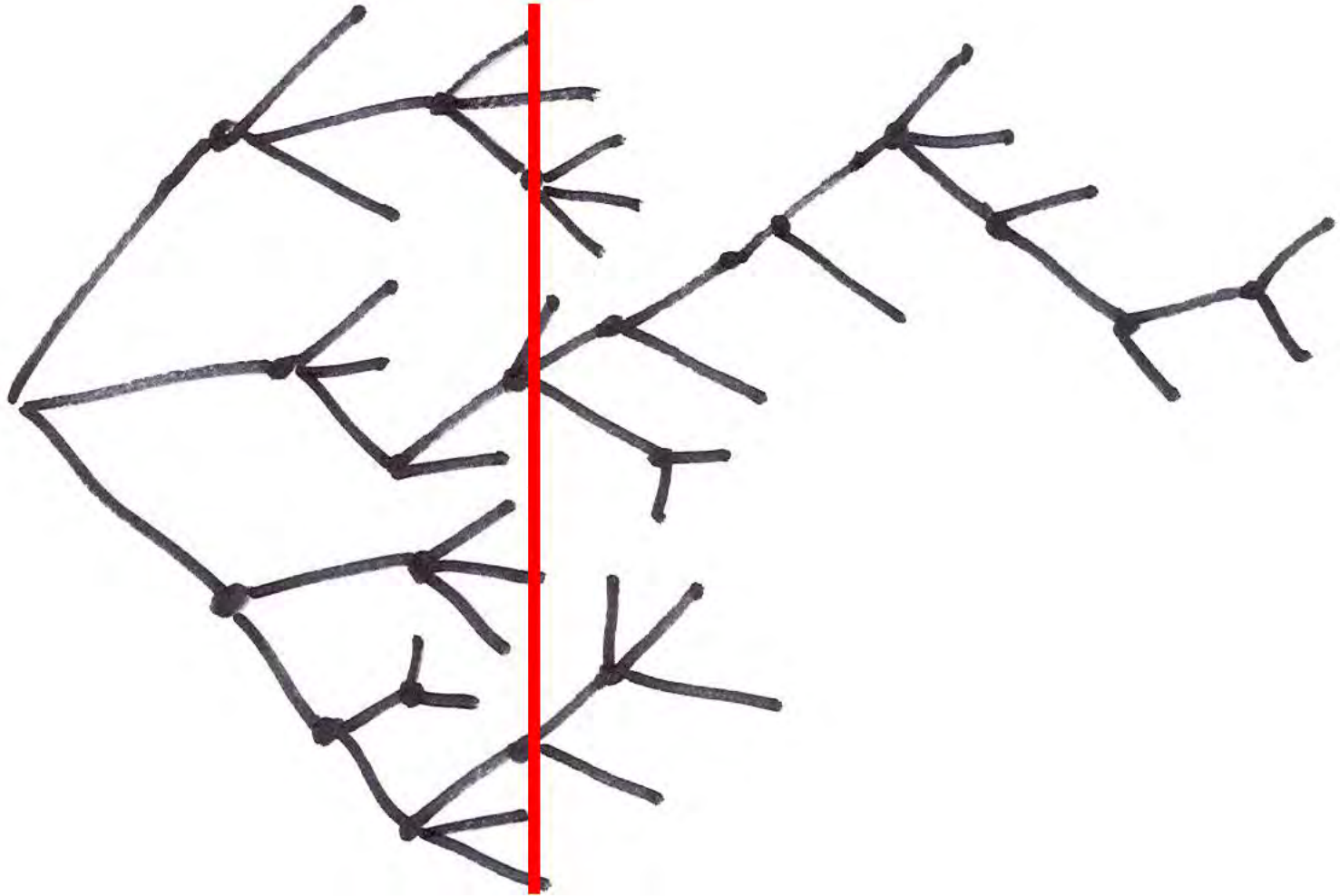Sketching generates too many ideas to implement
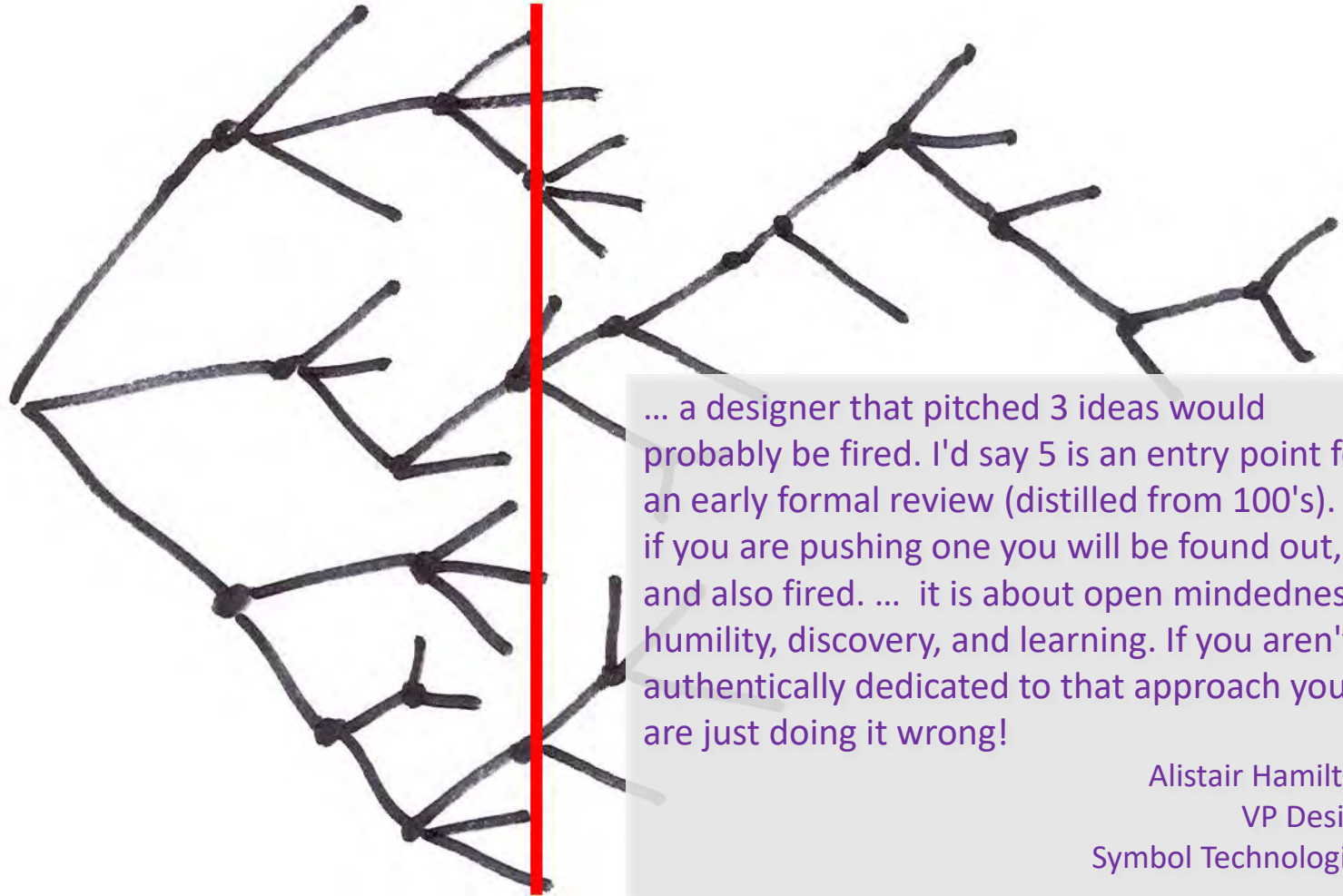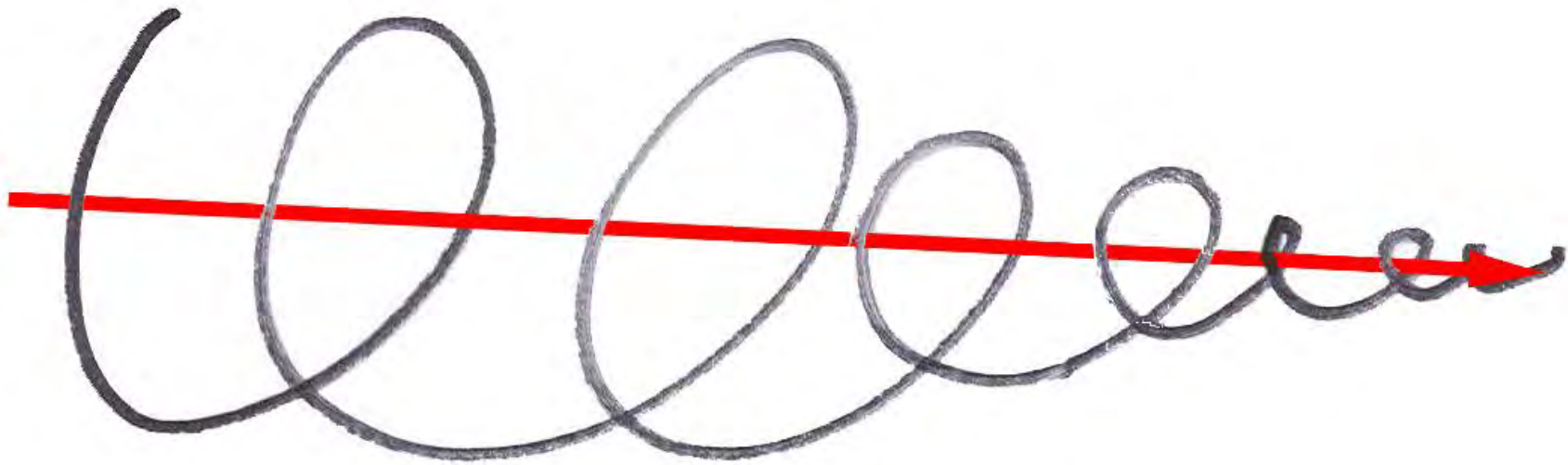
Idea Oscillation

Iteration Toward a Design

Exploration of Alternatives

Exploration of Alternatives

… a designer that pitched 3 ideas would probably be fired. I'd say 5 is an entry point for an early formal review (distilled from 100's). … if you are pushing one you will be found out, and also fired. … it is about open mindedness, humility, discovery, and learning. If you aren't authentically dedicated to that approach you are just doing it wrong!
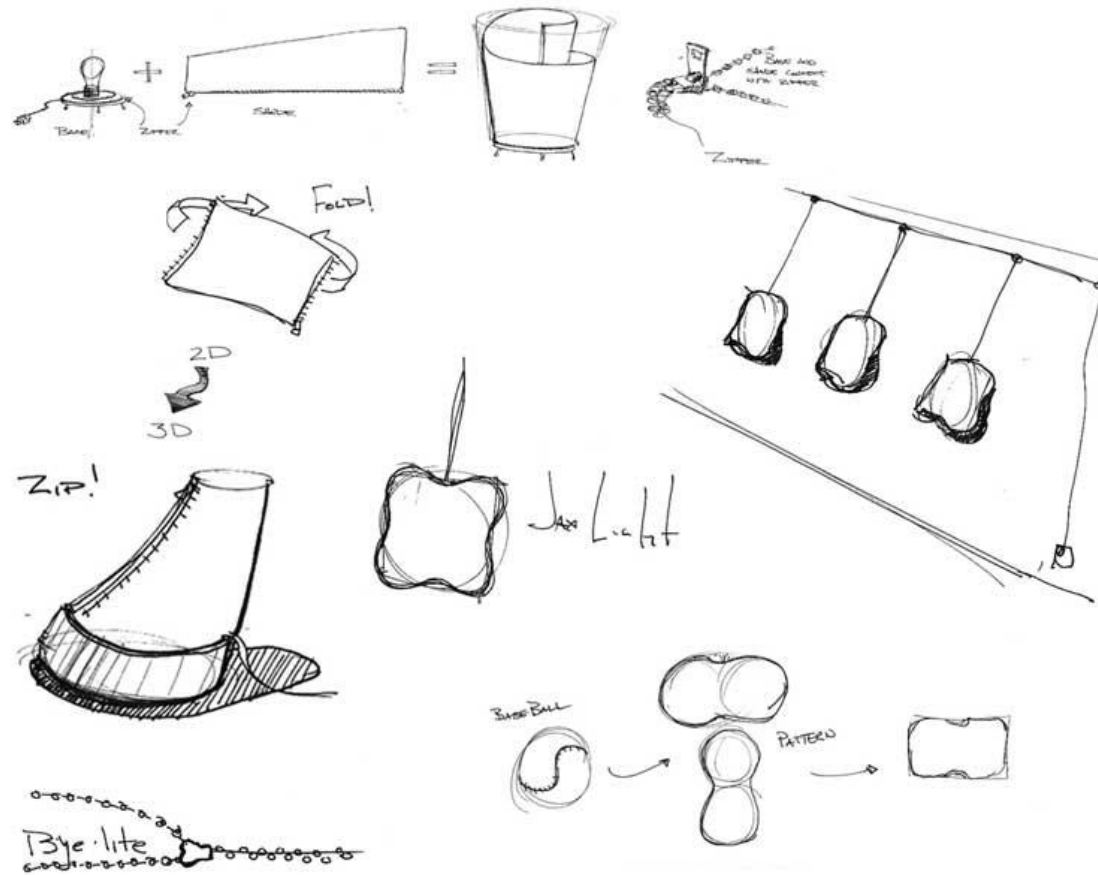
Alistair Hamilton
VP Design
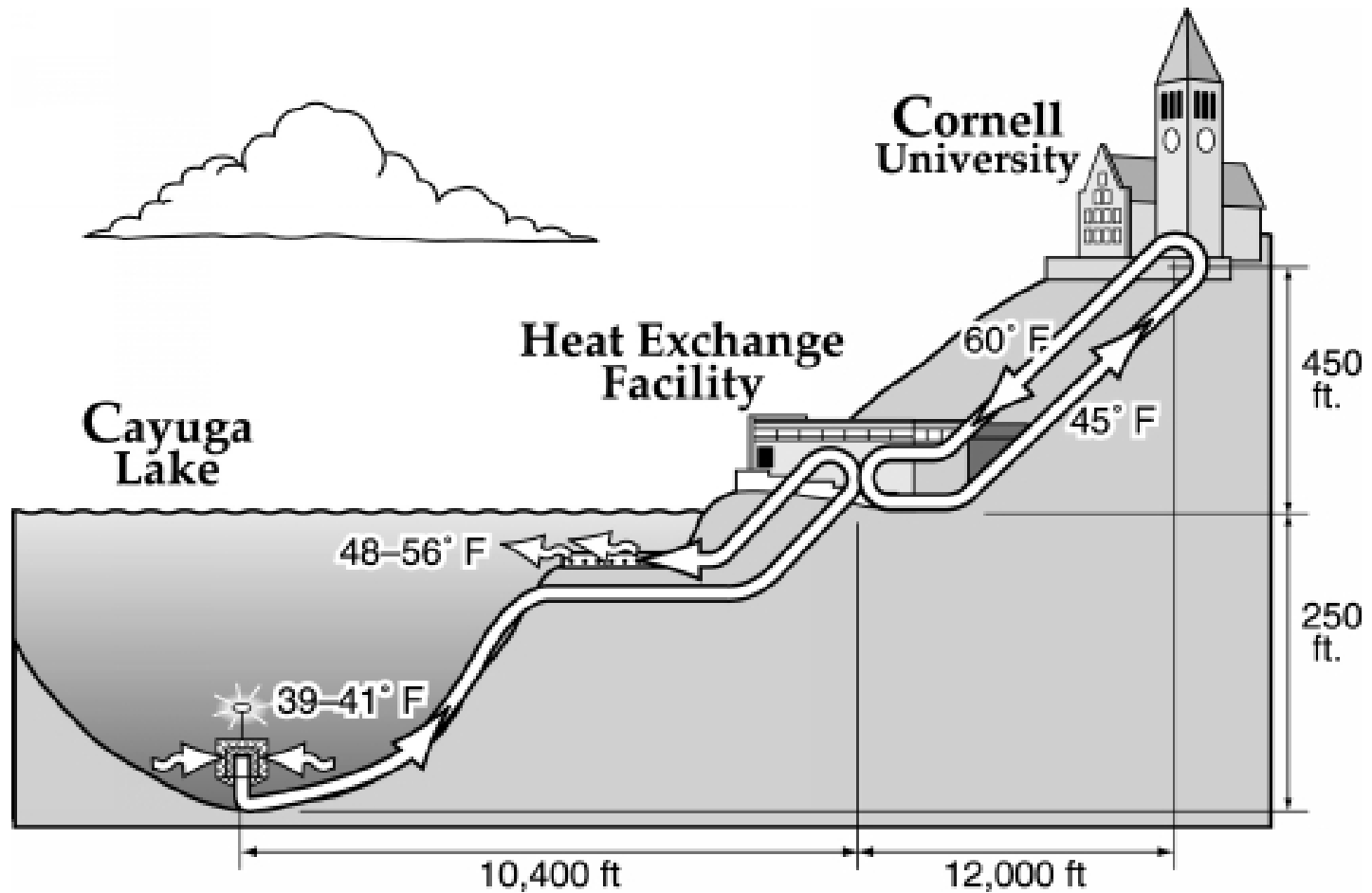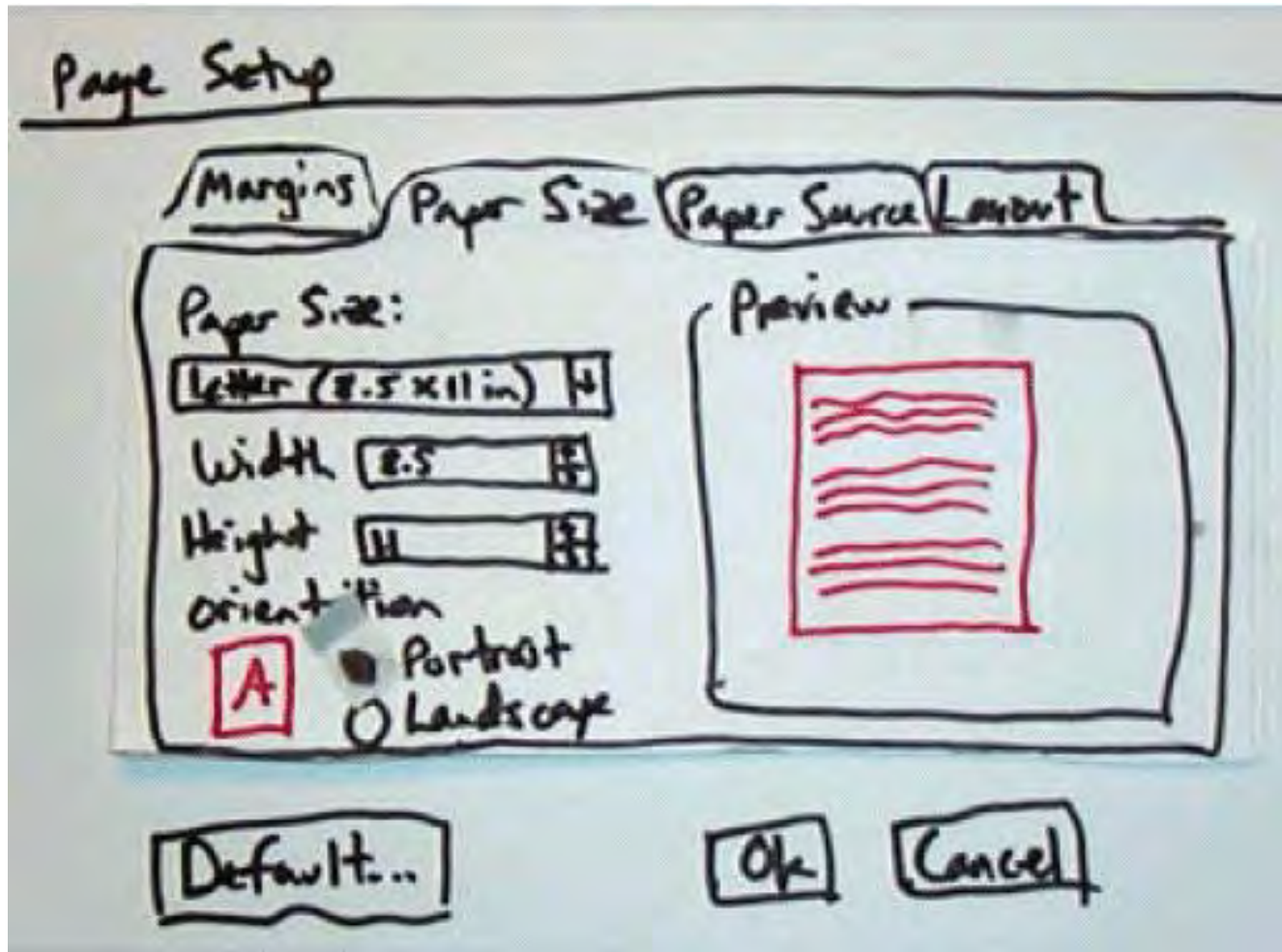Symbol Technologies

The Converging Path

Is this a sketch? Why or why not?

Is this a sketch? Why or why not?

Is this a sketch? Why or why not?
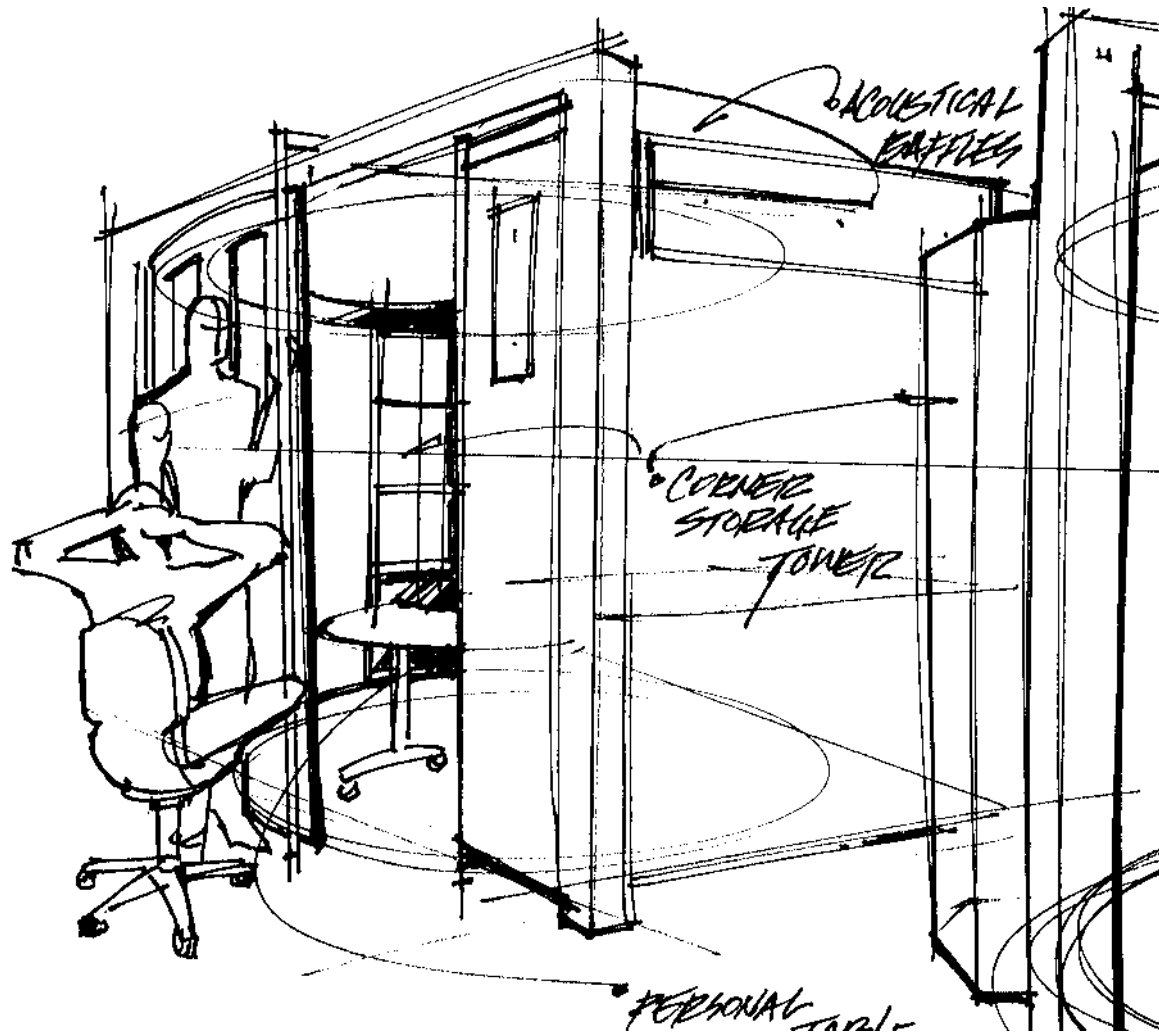
Is this a sketch? Why or why not?

Is this a sketch? Why or why not?

Is this a sketch? Why or why not?

Is this a sketch? Why or why not?

Is this a sketch? Why or why not?

Some Evidence

Task:

Create a web banner ad for Ambidextrous magazine.

Feedback in Parallel or Serial
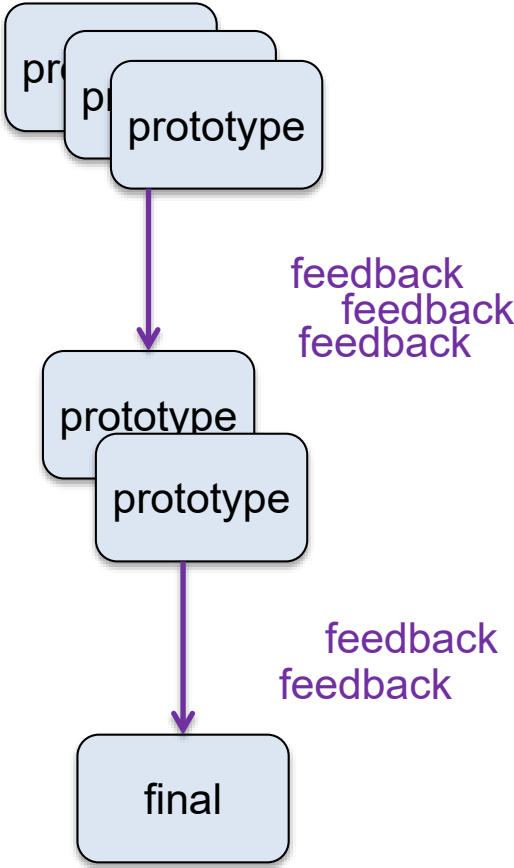
Parallel condition
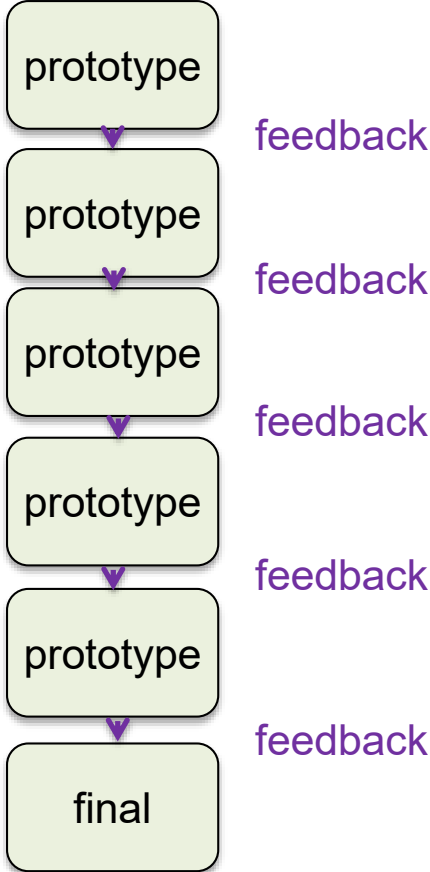
Serial condition

Procedure

serial
prototyping
condition

parallel
prototyping
condition

Dow et al. TOCHI 2010.

Parallel: more diverse, better, more clicks

Similarity

Expert quality rating (0-50)

Clicks per million impressions

Dow et al. TOCHI 2010.
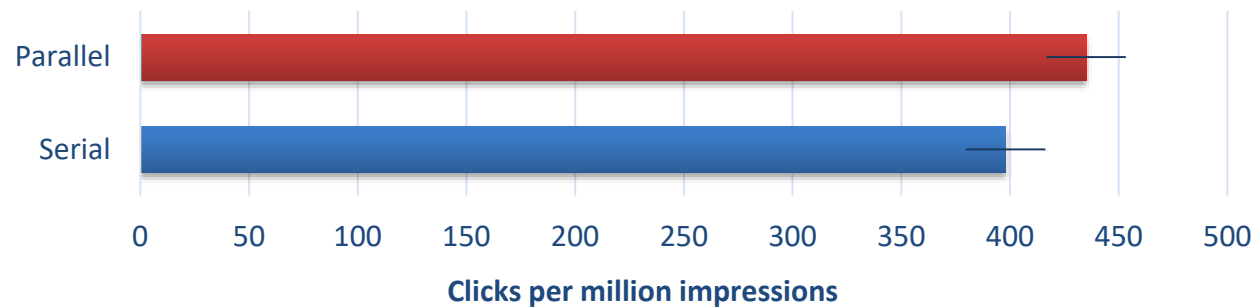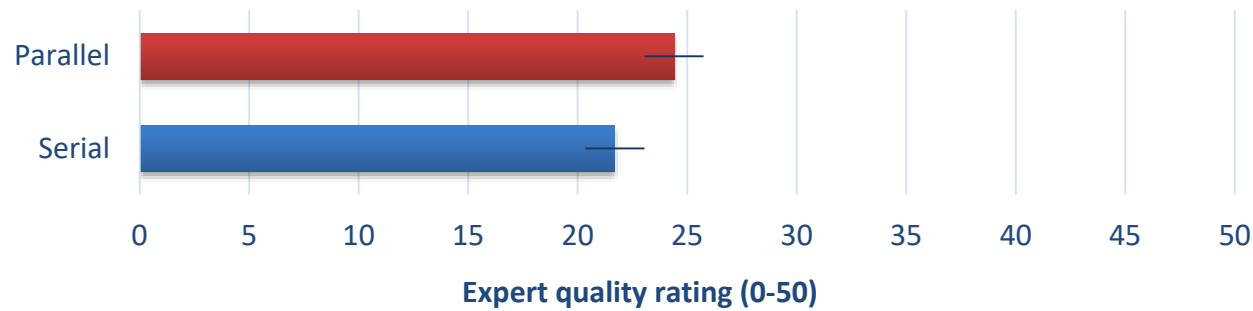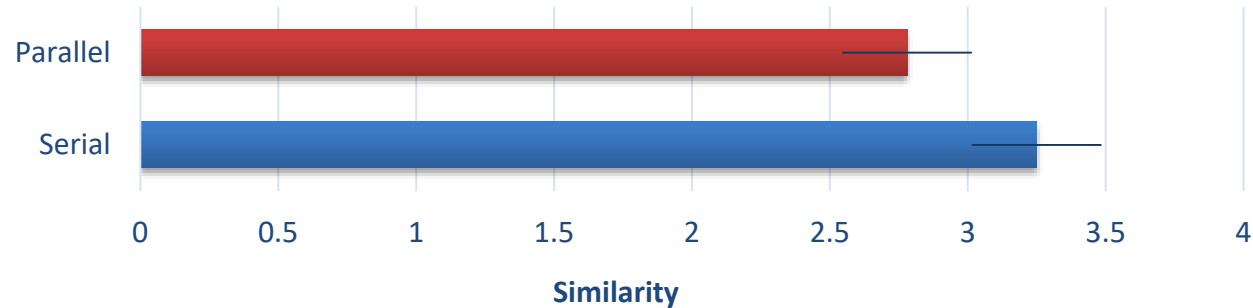
Share one or share your best?
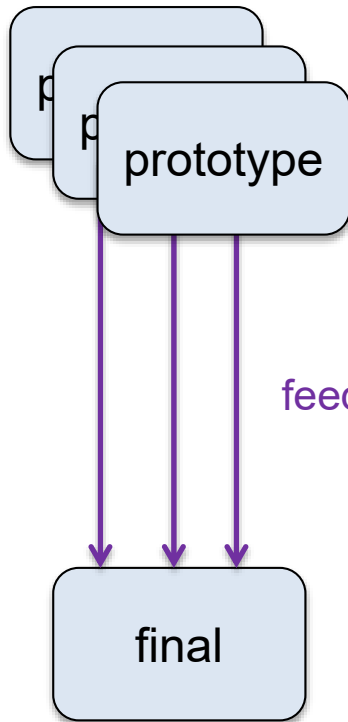
Share multiple condition
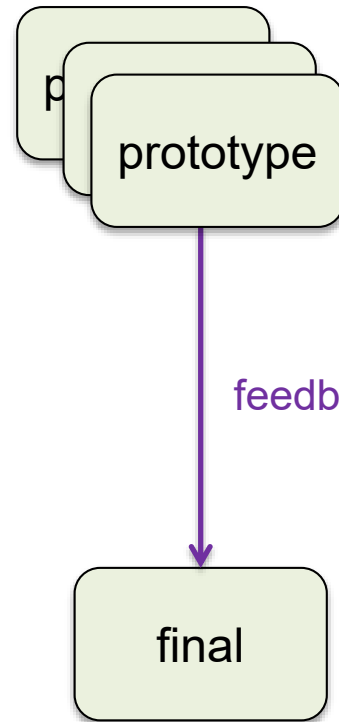
Share best condition
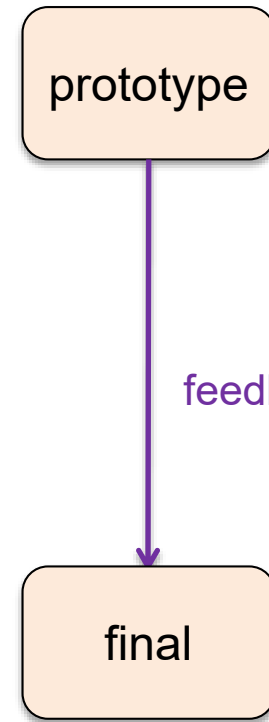
Make one condition

Share Multiple: better, more clicks

Expert quality rating (0-7)

Clicks per million impressions
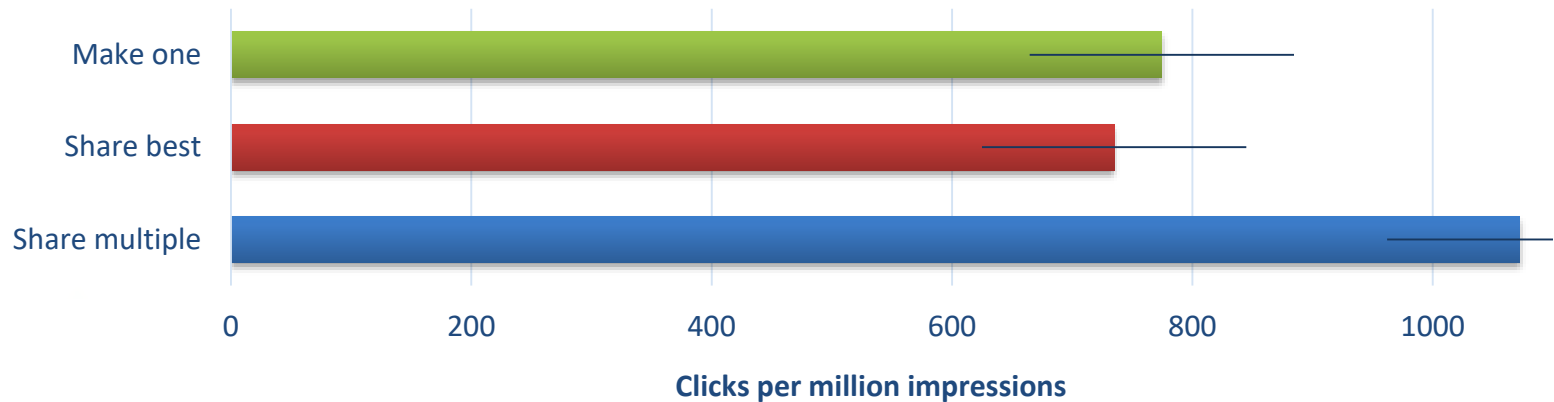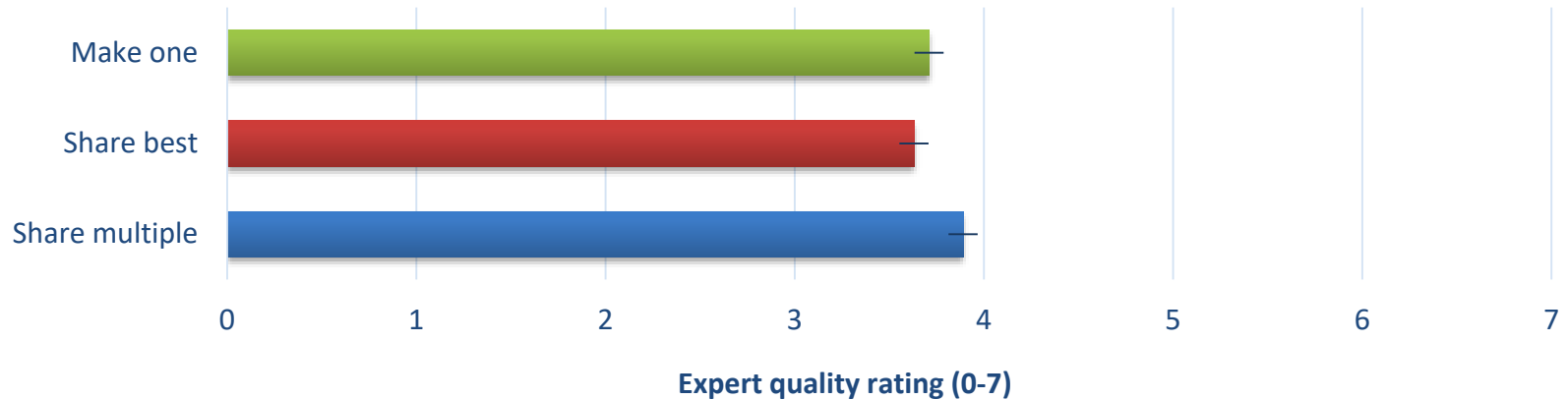
Some Evidence

Greater divergence in designs

    Prevents sticking with the first idea

    Allows mashing ideas together

Alternatives facilitate feedback

    Enable comparison

    Can improve tone of critique

Sketching and the Design Diamond

The design diamond is fundamental to understanding what you are doing here

   Much of your education, including in CSE, has taught you to focus on having the right answer

   Here it matters what you do long before the end

Most ideas get thrown out, including yours

   Better ideas are great criticism, and frequently would never have come about otherwise

Project Status

Looking Forward

2c: Design Research Check-In due Friday 1/20

2d: Design Research Review due Tuesday 1/24

2e: Task Review due Friday 1/27

2f: Design Check-In (3x4) Due Tuesday 1/31

2g: Design Review (1x2) Due Friday 2/3

Other Assignments

Readings to be Posted Soon

Rotating Feedback From Staff

We made a spreadsheet

		Section A				Section B				Section C		
		A-Maintai	A-Student	A-Underst	A-Wardro	B-Cancer	B-Distract	B-Puppy C	B-Support	C-Finding	C-Goals ar	C-Mental
Tue	2b - Design Research Plan	Eunice	Eunice	Ravi	Ravi	Eunice	Eunice	Ravi	Ravi	David	David	Elisabeth
Fri	2c - Design Research Check-In	Ravi	Eunice	Ravi	Eunice	Ravi	Eunice	Ravi	Eunice	Elisabeth	David	Elisabeth
Tue	2d - Design Research Review	Eunice	Ravi	Eunice	Ravi	Eunice	Ravi	Eunice	Ravi	David	Elisabeth	David
Fri	2e - Task Review	Ravi	Ravi	Eunice	Eunice	Ravi	Ravi	Eunice	Eunice	Elisabeth	Elisabeth	David

Several goals in the resulting rotation

Equal time with the two TAs in your section

No "streaks" greater than two with either TA

Balanced Friday pairings with other groups

Rotating Feedback From Staff

Eunice
- A - Maintaining Social Relationships
- A - Student Self Tracking
- B - Cancer Treatment Side Effect Management
- B - Distracted Driving

Ravi
- A - Understanding Subscription Services
- A - Wardrobe Management and Cost Consciousness
- B - Puppy Care
- B - Supporting Writers

David
- C - Finding Time to Read
- C - Goals and Habit Formation
- D - Eye Strain and Breaks
- D - Managing Mental Health

Elisabeth
- C - Mental Wellness
- C - Transit while Traveling
- D - Personal Utility Tracking
- D - Wardrobe Management and Fashion

CSE 440: Introduction to HCI

User Interface Design, Prototyping, and Evaluation

Lecture 05:
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