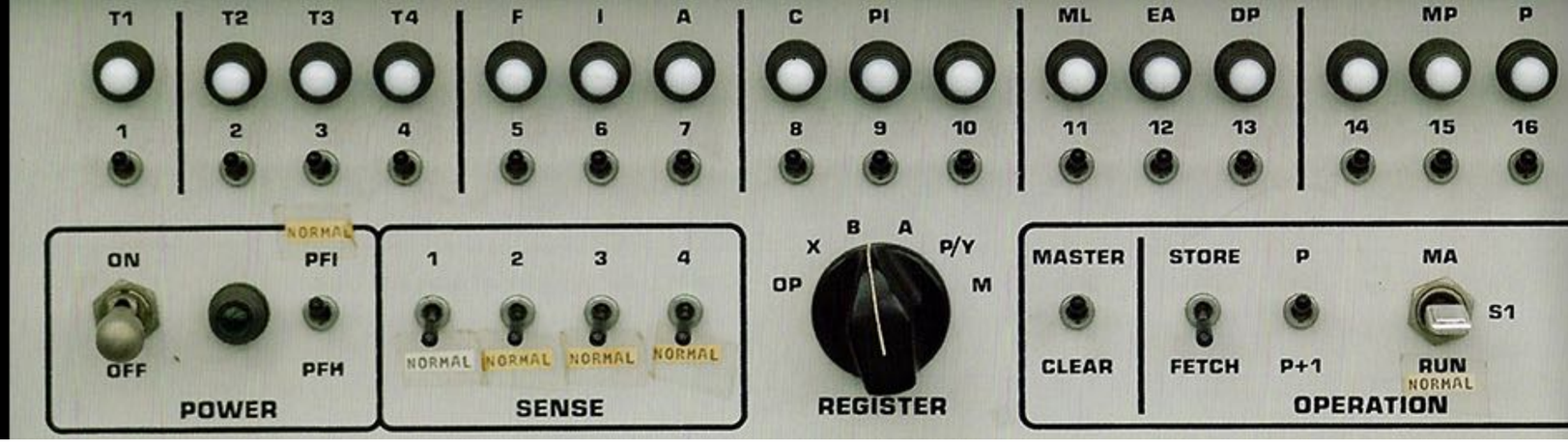
CS160

USER INTERFACE DESIGN

FALL 2018



THE DESIGN CYCLE

27 AUG 2018

ERIC PAULOS
www.paulos.net

UNIVERSITY OF CALIFORNIA Berkeley

ANNOUNCEMENTS

Reading Responses

Due 5 Sep (before class) – DESIGN 01

Due 7 Sep (Fri @ 11:59pm) – PROG 01

Enrollment

Late reading responses

Screen Record PROG 01

What Section will you Attend?

Vote on Piazza

PAUL DEBEVEC

Fiat Lux: Creating Photoreal Digital Actors (and Environments) for Movies, Games, and Virtual Reality

EECS Colloquium

Wednesday, August 29, 2018

306 Soda Hall (HP Auditorium)
4:00 - 5:00 pm

Paul Debevec

Google VR & USC ICT

Colloquium

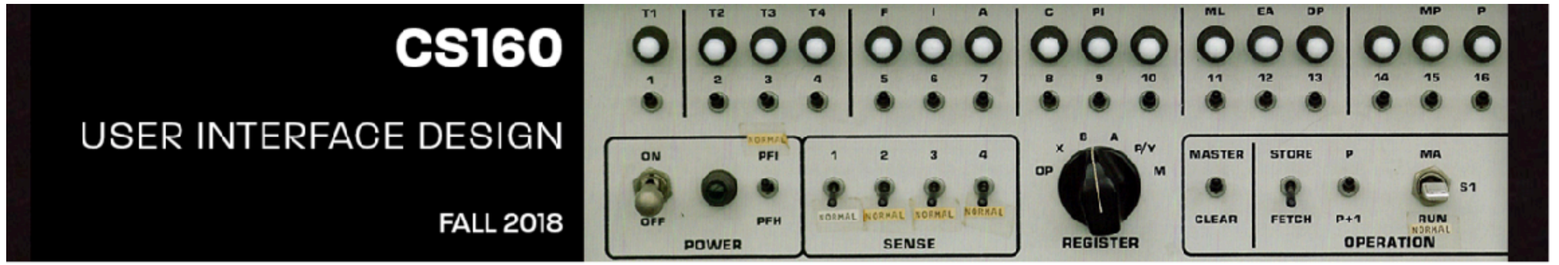
08/29/18: Fiat Lux: Photoreal Digital A Environments) for and Virtual Reality

Archive

SECTIONS MOVING FORWARD

Vote on Piazza

CLASS WEBSITE: HCI.BERKELEY.EDU/CS160



Home FAQ Showcase Requirements Grading Syllabus bCourses Piazza

Syllabus

WEEK 1

22 Aug Introduction (REQUIRED)

Slides
Assignment: Reading Response (due before class on 27 Aug)
Assignment: PRCG 01: Electric Time (due by 11:59pm on 7 Sep)
Assignment: DESIGN 01: Watches in the Wild (due before class 5 Sep)

Section: Android Introduction

WEEK 2

27 Aug The Design Cycle, Brainstorming, and Critique

Slides
Reading: Rogers, Y., Sharp, H., & Preece, J. (2011). Interaction Design: Beyond Human-Computer Interaction (3rd ed. ed.), pp 9-18.

29 Aug Ubiquitous and Context Aware Computing

Slides
Reading: Mark Weiser. 1999. The Computer for the 21st Century. Scientific American, Sept 1991.

Section: Making Apps with Android

WEEK 3

03 Sep Labor Day

No Class

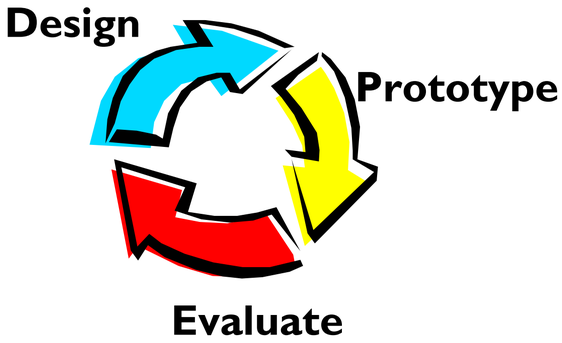
05 Sep Storyboard, Scenarios, and Personas

Slides

SECTIONS AND OFFICE HOURS

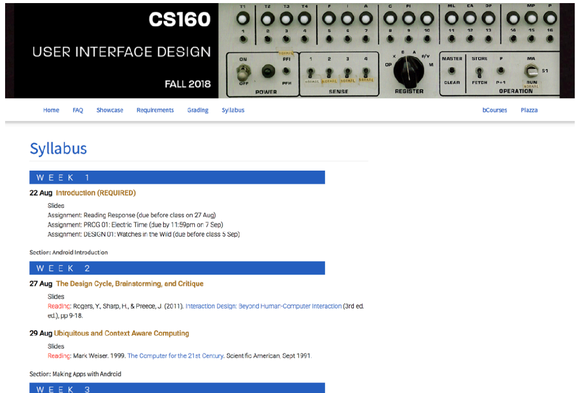
	Office Hour
Adriana Babakanian	M 9–10 A • 310A Jacobs
Eric Paulos	T 11–12 P • 415 SDH (book)
Vinay Satish	T 2–3 P • 341A Soda
Emily Pedersen	Th 2–3 P • 10C Jaocbs
Michelle Chen	Th 530–630 P • Soda-Alcove-341B
Jessie Lyu	F 10–11 A • 10C Jacobs
David Olivar	-

REVIEW



Course overview

Project theme



Course mechanics

DUE WEDNESDAY: NEXT READING RESPONSE

RR 02

Publish | Edit | ⋮

READING:

Mark Weiser. 1999. The computer for the 21st Century. Scientific American, Sept 1991.

Weiser-SciAm.pdf

Prompt:

The vision of Ubiquitous Computing presented and prototyped in this paper was likely made well before you were even born! How close do you think this vision is to our world today? Discuss an element or elements of this vision have not yet arrived? Will it every happen? Why or why not?

DESIGN 01: WATCH IN THE WILD: DUE 5 SEP

The **goal of this assignment is to introduce you to iterative design**.

That way, during the main course project, the steps of the design process will be more familiar.

You will

observe and interview users

brainstorm

prototype

get feedback

DESIGN EXERCISE

The point is NOT to implement one of the examples listed in the assignment

- Talk to and observe **2 people**
- Brainstorm at least **12 ideas** – go for breadth (radically different ideas)
- pick “the best” idea
- prototype
- Evaluate it – get feedback from users

INTERVIEW TIPS

THINGS TO DO

Don’t stress too much!

Plan ahead & reach out early for scheduling.

Think about what your goals are.

Build rapport: start slow & then dig deeper.

Plan how you are going to take notes ahead of time.

Thank your interviewee for their time & help.

INTERVIEW TIPS

THINGS NOT TO DO

Ask yes-no questions.

Do you check your phone a lot?

Ask leading or biased questions.

Leading: Would you be happier if you had X?

Non-leading: How would you feel if you had X?

Ask multiple questions within one question.

How much time & how often do you check emails?

INTERVIEW TIPS: PREPARE

Prepare an interview guide. This is to help you make sure that you don't forget what you were asking participants.

Establish high level goals or topics, e.g. I want to understand when/why people use Angry Birds.

Be sure that your questions are open-ended, and non-leading. Follow a logical flow.

Don’t get too restricted in your guide.

If your user mentions something interesting that you would like more insight on, it is totally okay to go off script.

INTERVIEW TIPS: PREPARE

Leading question:

What part of the app do you find frustrating?

Binary question:

Do you like this interaction or this interaction?

Good question:

Could you tell me situations when the app was not useful/useful?

INTERVIEW EXAMPLES

Do you prefer the camera on Android phones over the iPhone?

INTERVIEW EXAMPLES

What’s been your experience with the camera on the Android?

What’s you opinion of it?

INTERVIEW EXAMPLES

What influences your decision to use one camera over another? Why do you have more than one type of camera?

INTERVIEW EXAMPLES

Do you prefer to take pictures of people or environments?

INTERVIEW EXAMPLES

Tell me about a time you really enjoyed taking pictures. What made this experience enjoyable?

INTERVIEW EXAMPLES

Would you want a feature that lets you automatically post pictures to Facebook?

INTERVIEW EXAMPLES

What are your thoughts on a feature that lets you automatically post your photos to a social network?

INTERVIEW EXAMPLES

How do you currently share photos? With whom? Tell me about the last time you shared your photos with someone. What did you like/dislike about the experience?

FORMING GOOD QUESTIONS

Ask questions that elicit the user to reflect on their process or past.

Can you think back to a time when you the app did not work? How did that affect what you were doing? What did you end up doing?

How might you teach someone how to use X? What tips might you give them?

PILOT TEST

With a user, usually a classmate

Make sure:

That your interview does not go past your allotted time

Your questions make sense.

You get the information you need for your project.

CONDUCTING THE INTERVIEW

Privacy

Explicitly tell the participant that there identity will not be disclosed.

Rapport

Develop a rapport with the participant. Mimic their body language. Actively listen to what people say. It is okay to go off script.

Debrief

Let them know what you learned.

Close well

Thank them for their time.

DOCUMENTING THE INTERVIEW

Taking video

Participants may not approve of this. One way to get video while making participants comfortable is to only shoot below the neck.

Recording audio

Very useful, less identifiable, but a pain to process.

Taking photos

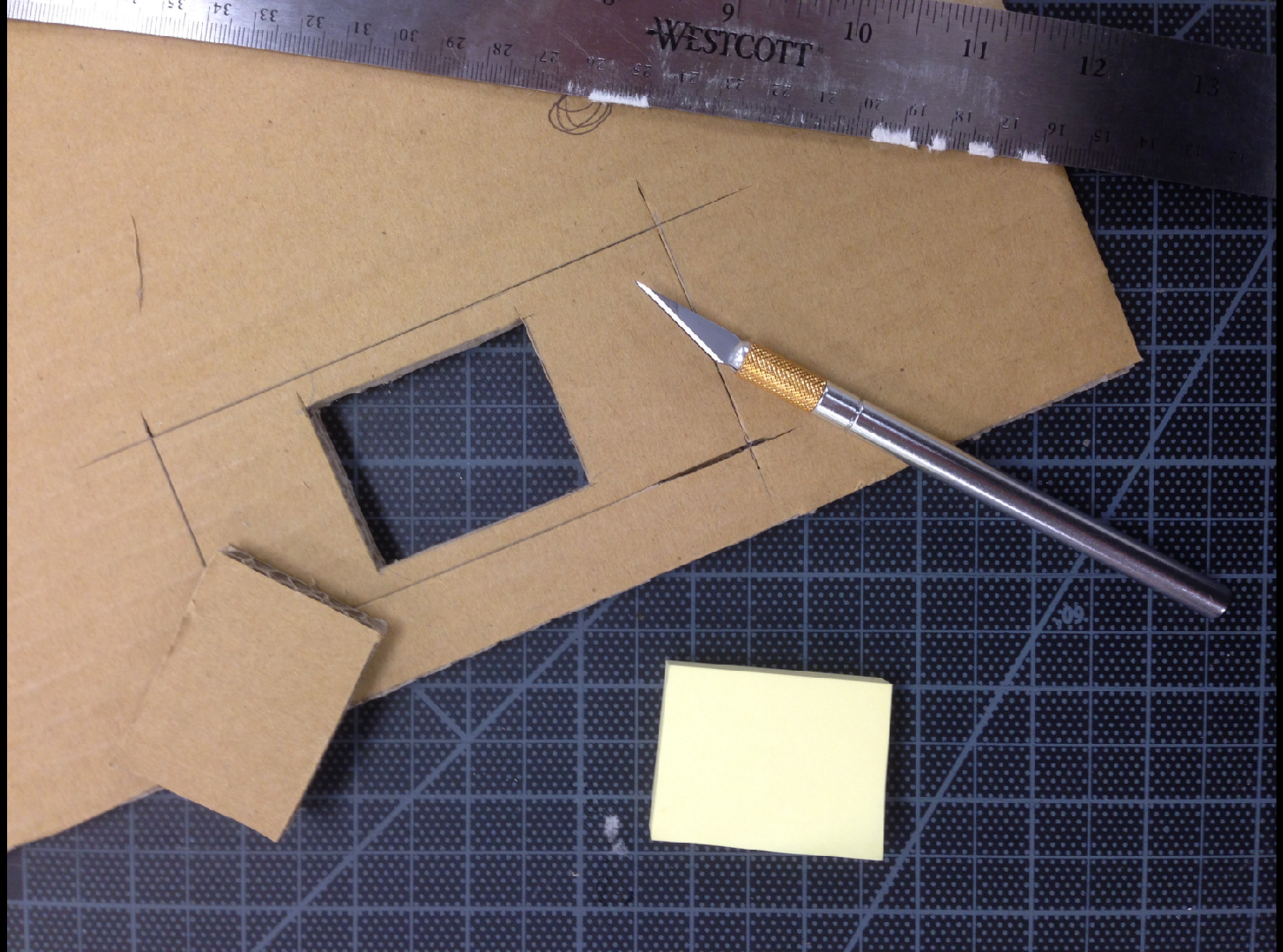
Quick and easy. What do participants reference?

Quotes

Jot down memorable lines that communicate the gist of the interview.

Artifacts

Can participants make something? Can you take something from the environment?


WESTCOTT

DESIGN EXERCISE (GRADING)

- Did you talk to at least two target users who are not college students? (4pts)
- Did you upload photos that document your interviews? (3pts)
- Did you thoughtfully, succinctly and clearly describe what you learned from your conversations, and synthesize both interviews? (5pts)
- Did you brainstorm at least 12 ideas? (4pts)
- Did you make a prototype and describe it in your submission (w/ photos)? (5pts)
- Did you test your prototype with a user? (4pts)
- Did you write down a list of insights from the test and tie it back to the interviews? (5pts)

PROG 01: ELECTRIC TIME: DUE 7 SEP

PROG 01: Electric Time

Publish | Edit | ⋮

In your first assignment you will learn how to:

- Install the Android SDK and developer tools
- Start programming with the Android SDK
- Build a simple Android application and test it in the emulator

You will build an **electric personal transportation conversion** app to accomplish these goals.

Hey, it's 2018 and we're all going electric but sorting out all the options is so confusing. For this assignment, you'll be making an application which, given an input of **a desired distance to travel** and **a type of personal transportation**, you'll be able to see **how much time it will take to travel that distance** using the selected type of transportation as well as the **equivalent amount of time using a different electric personal transport**. More detailed instructions are below.

You will submit your **source code, the executable, a short write-up, screenshots and a narrated video.** It is your responsibility to ensure that the executable has all the resources it needs to execute.

Instructions

1. **Choose a development machine**: You should be able to do development on your own laptop and we expect that most people will want to do this. Android has good support for Windows, Mac and Linux. We recommend having

HELP WITH PROGRAMMING ASSIGNMENT

Office Hours

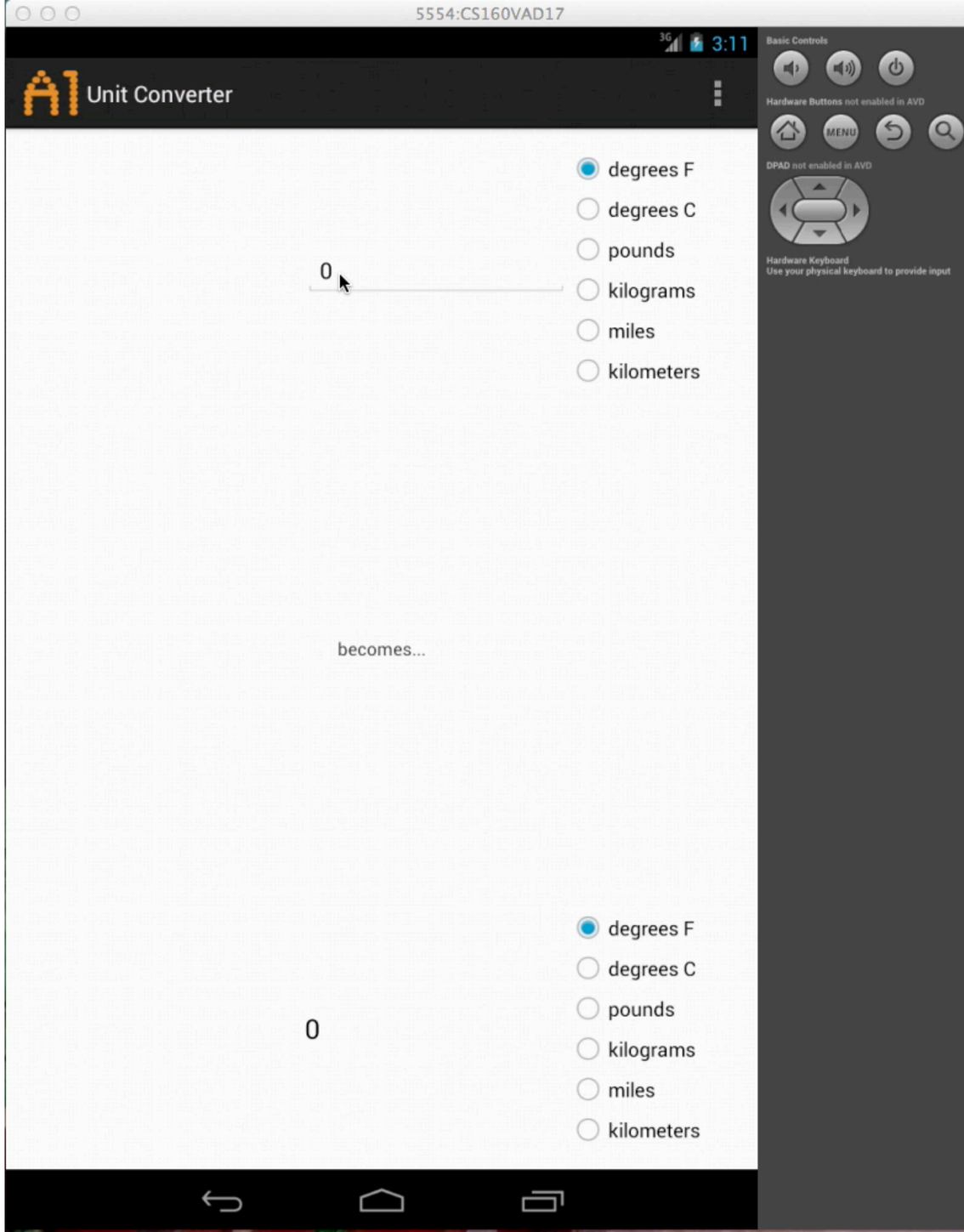
Section

Piazza

Also recommended

Follow the official Android tutorials

Building Your First App


5554:CS160VAD17
3:11
Unit Converter
degrees F
degrees C
pounds
kilograms
miles
kilometers
0
becomes...
degrees F
degrees C
pounds
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miles
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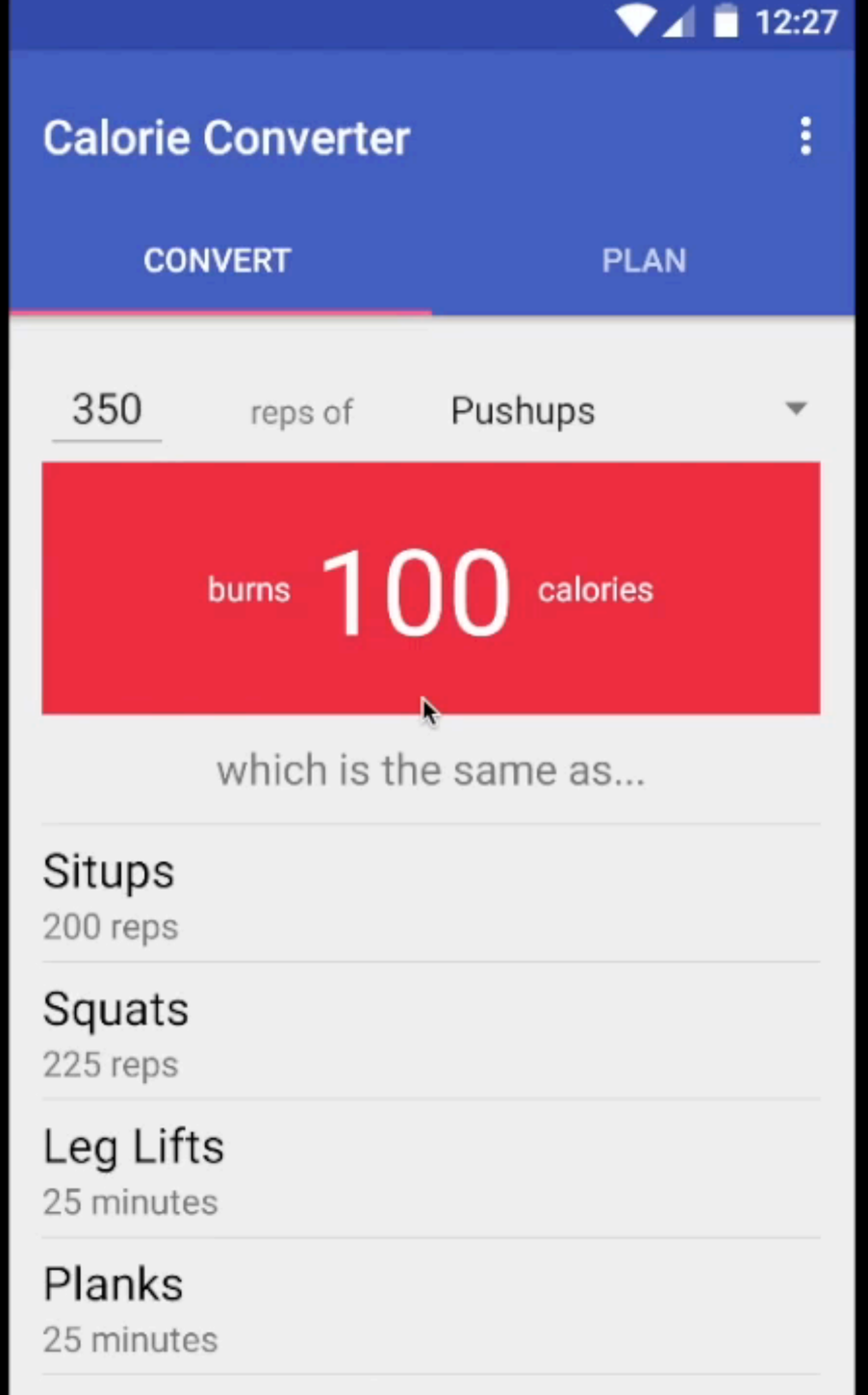
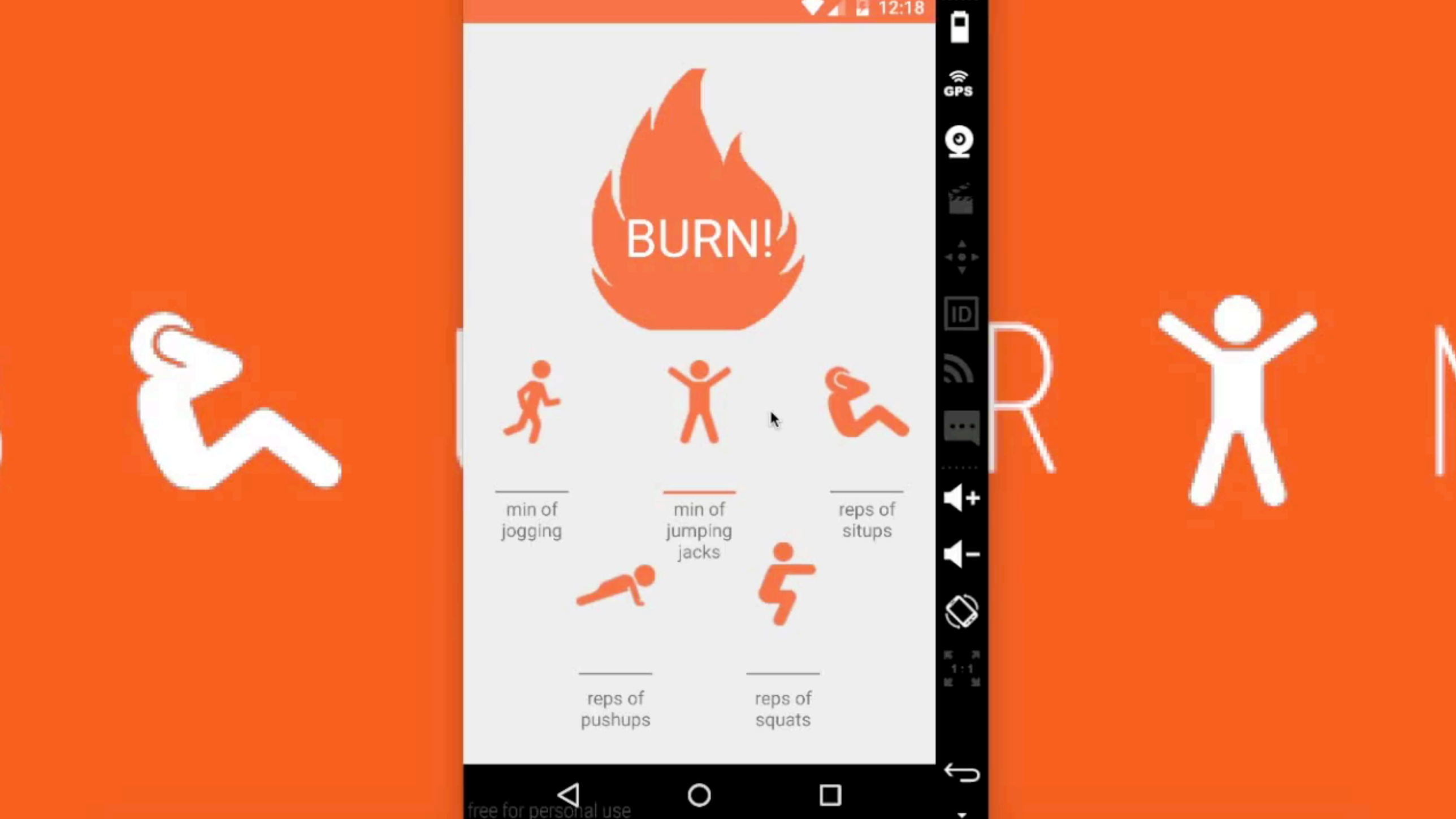
Basic Controls
Hardware Buttons not enabled in AVD
MENU
DPAD not enabled in AVD
Hardware Keyboard
Use your physical keyboard to provide input


12:27
Calorie Converter
CONVERT
PLAN
350
reps of
Pushups
burns 100 calories
which is the same as...
Situps
200 reps
Squats
225 reps
Leg Lifts
25 minutes
Planks
25 minutes


12:18
BURN!
min of jogging
min of jumping jacks
reps of situps
reps of pushups
reps of squats
GPS
free for personal use

You Animal!


Human


Oski


Cat

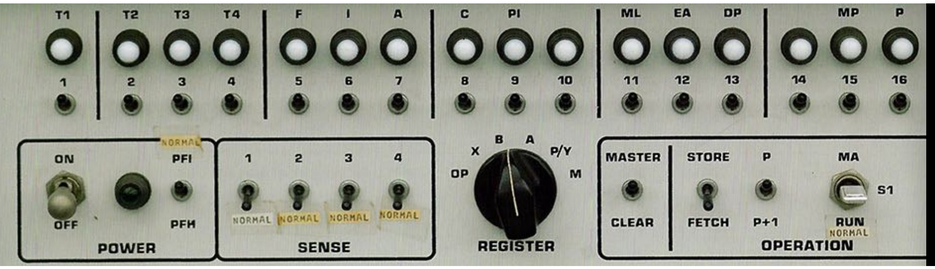
Human Years

0
Human Years


Human

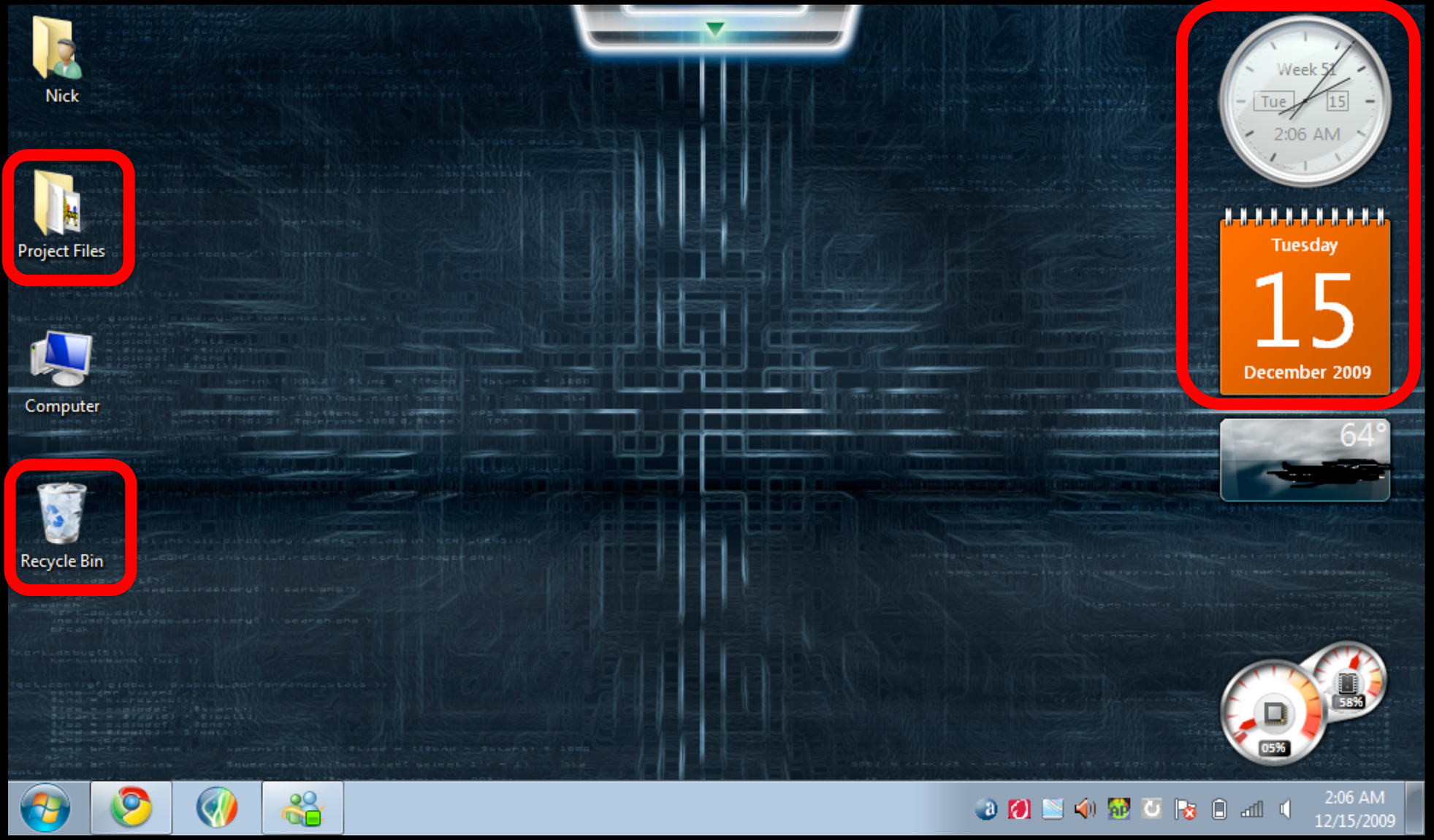

Oski


Cat

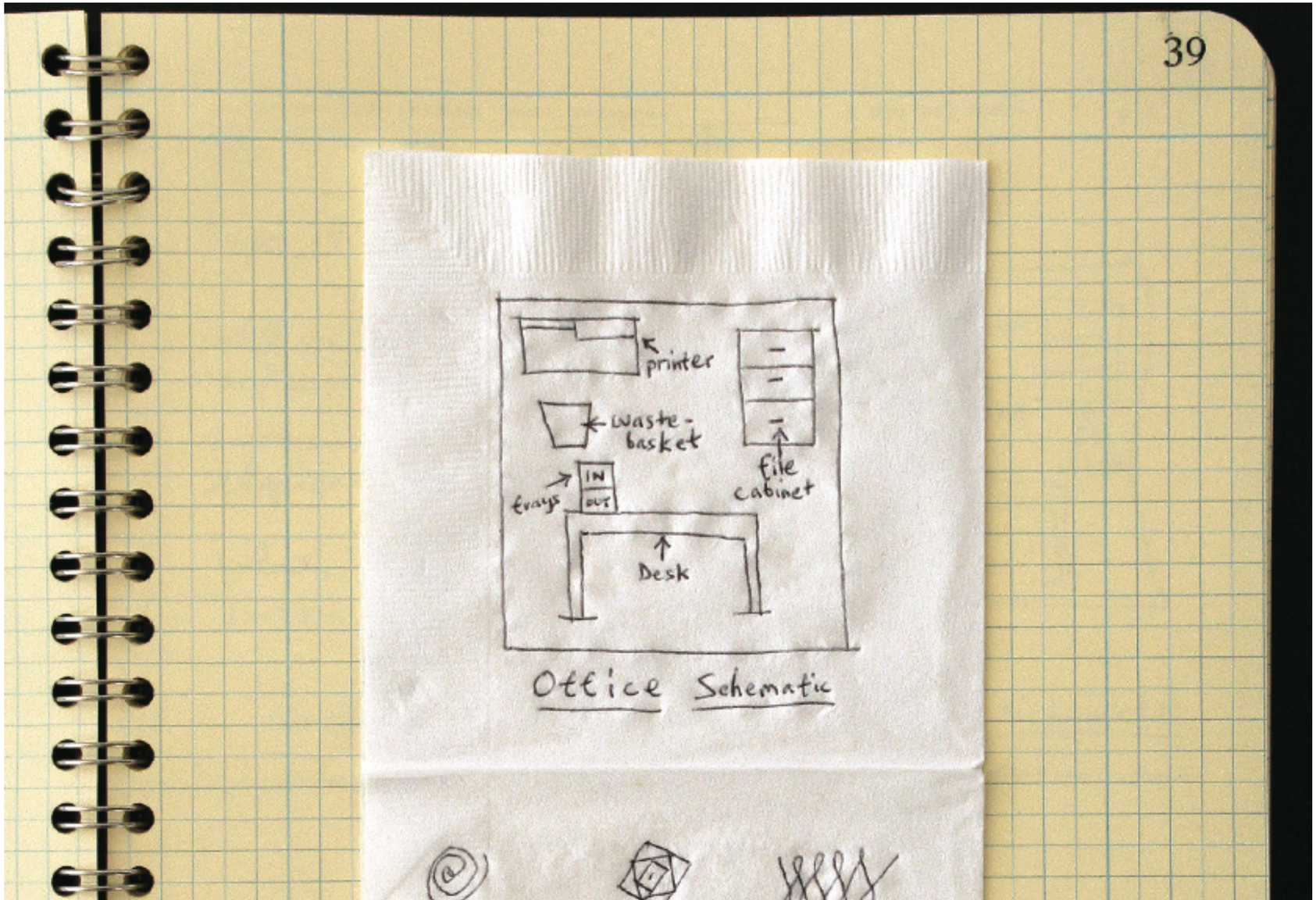


LOOKING AT INTERACTION DESIGNS


Password
Generated random password is: 'oOmunHz&wCql#FL#|tiTh#GQ:sc/mI:'
Make sure you write this down because it will be needed for future upgrades.
OK

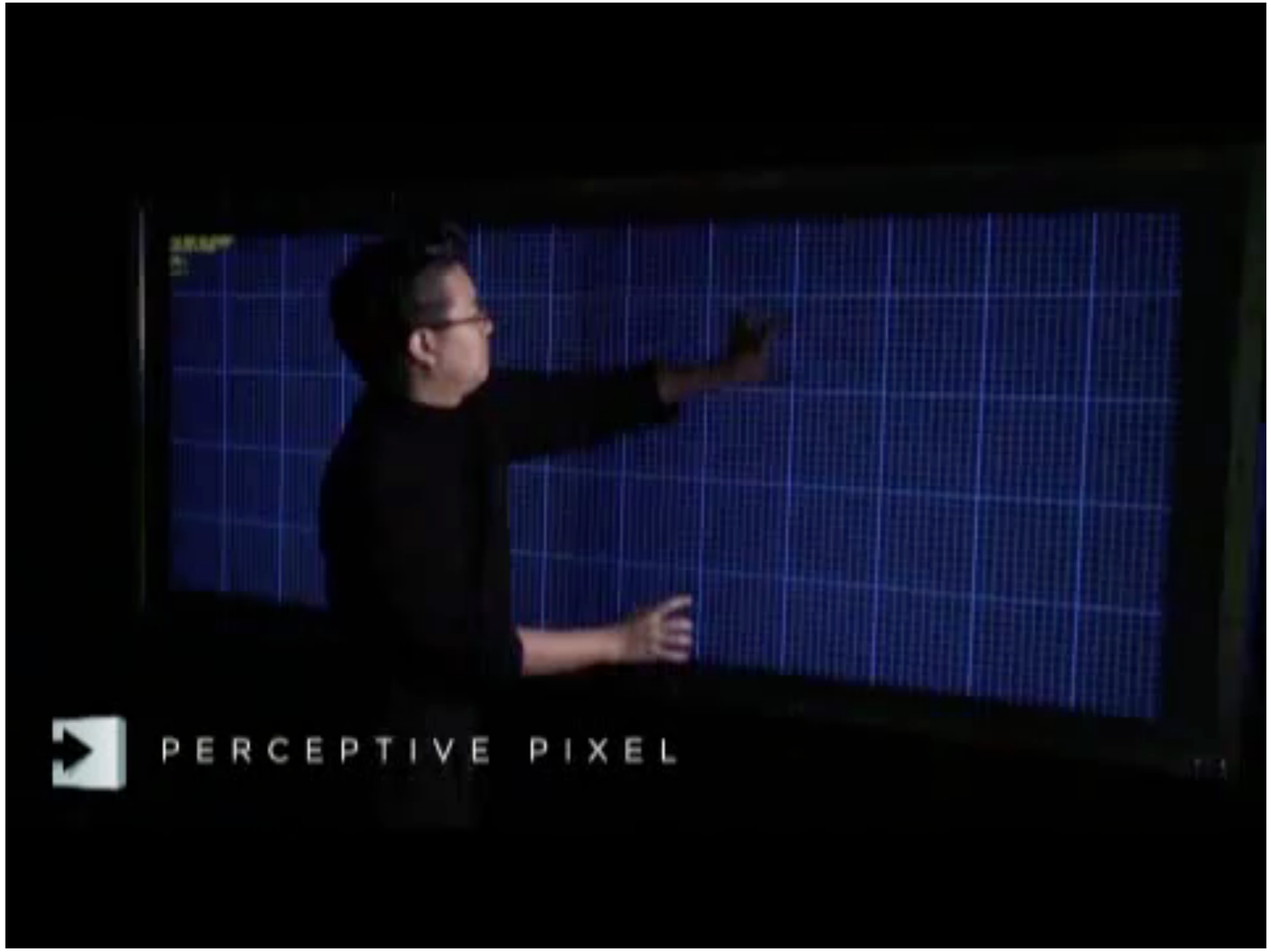

Nick
Project Files
Computer
Recycle Bin
Week 51
Tue
15
2:06 AM
Tuesday
15
December 2009
64°
58%
05%
2:06 AM
12/15/2009

THE DESKTOP METAPHOR...



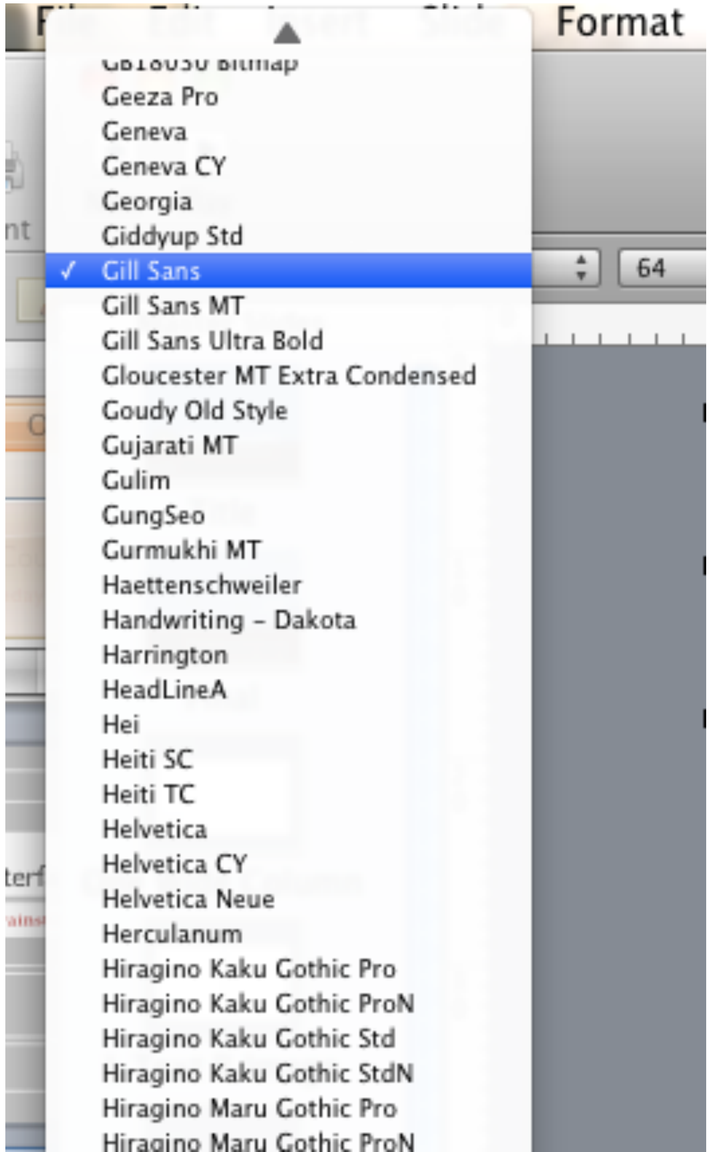
IS THIS A GOOD IDEA? WHEN?

HOW ABOUT THIS?

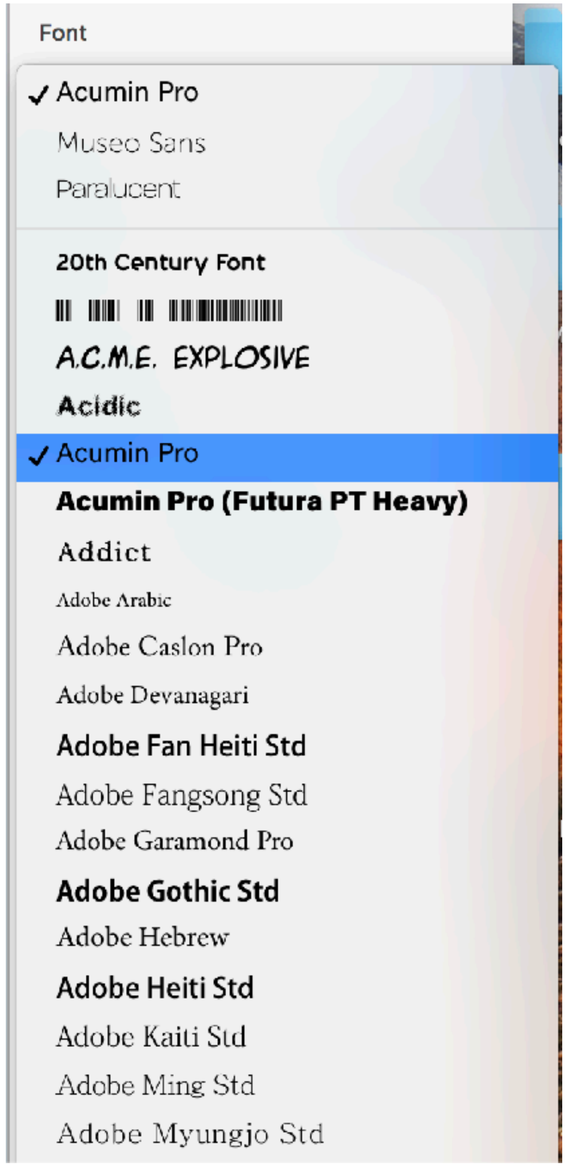


Jeff Han,
Perceptive Pixel

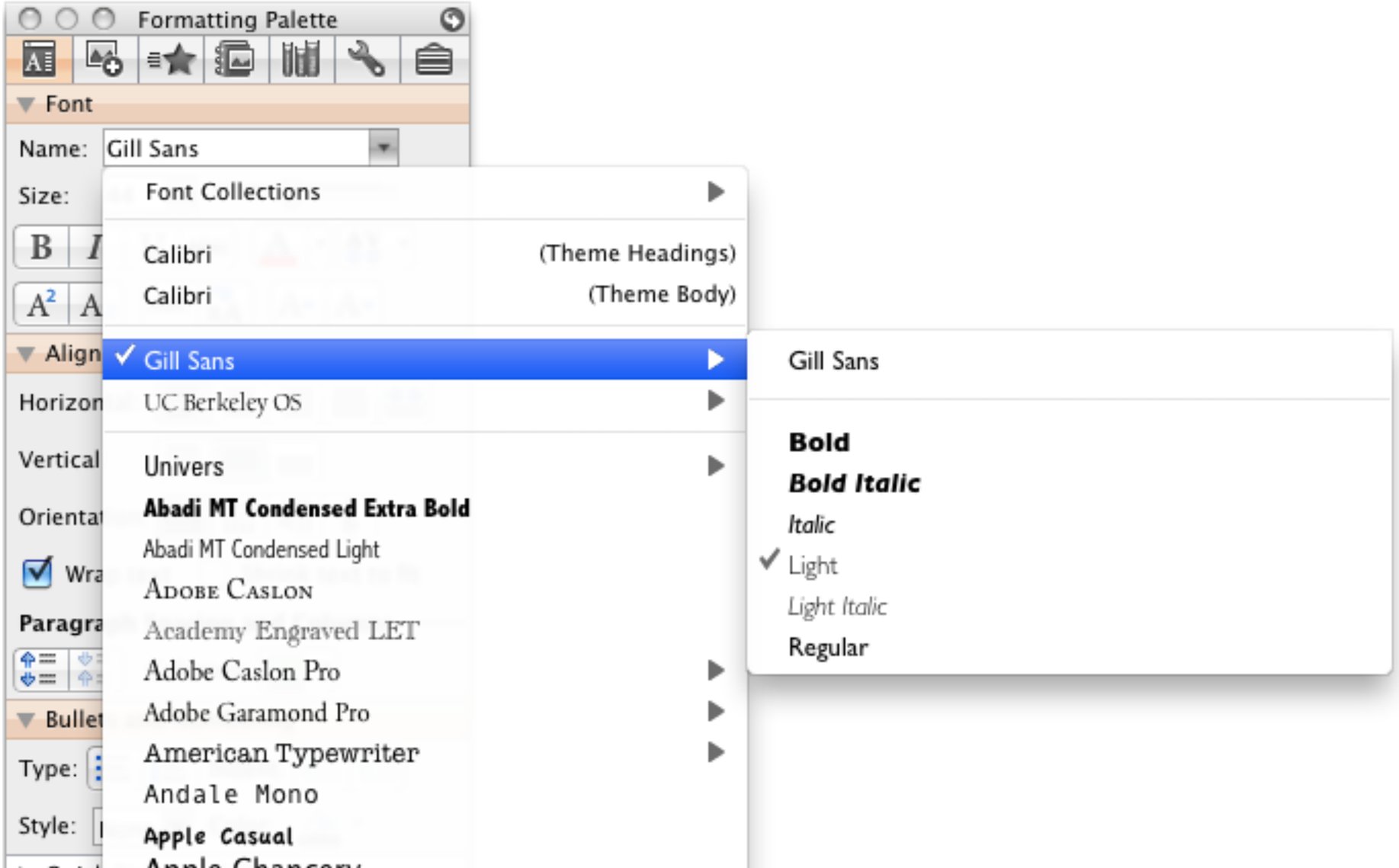
FONT SELECTION



FONT SELECTION



FONT SELECTION

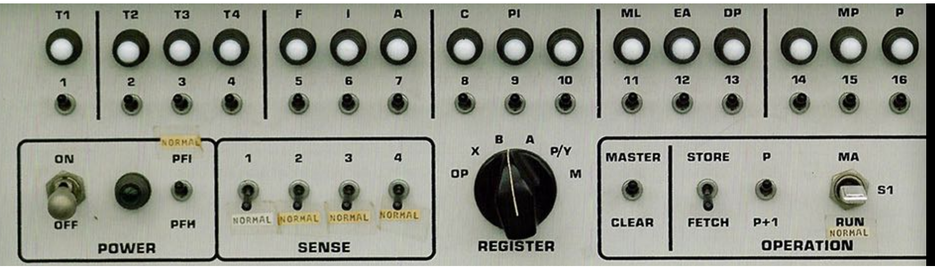


TOPICS FOR TODAY

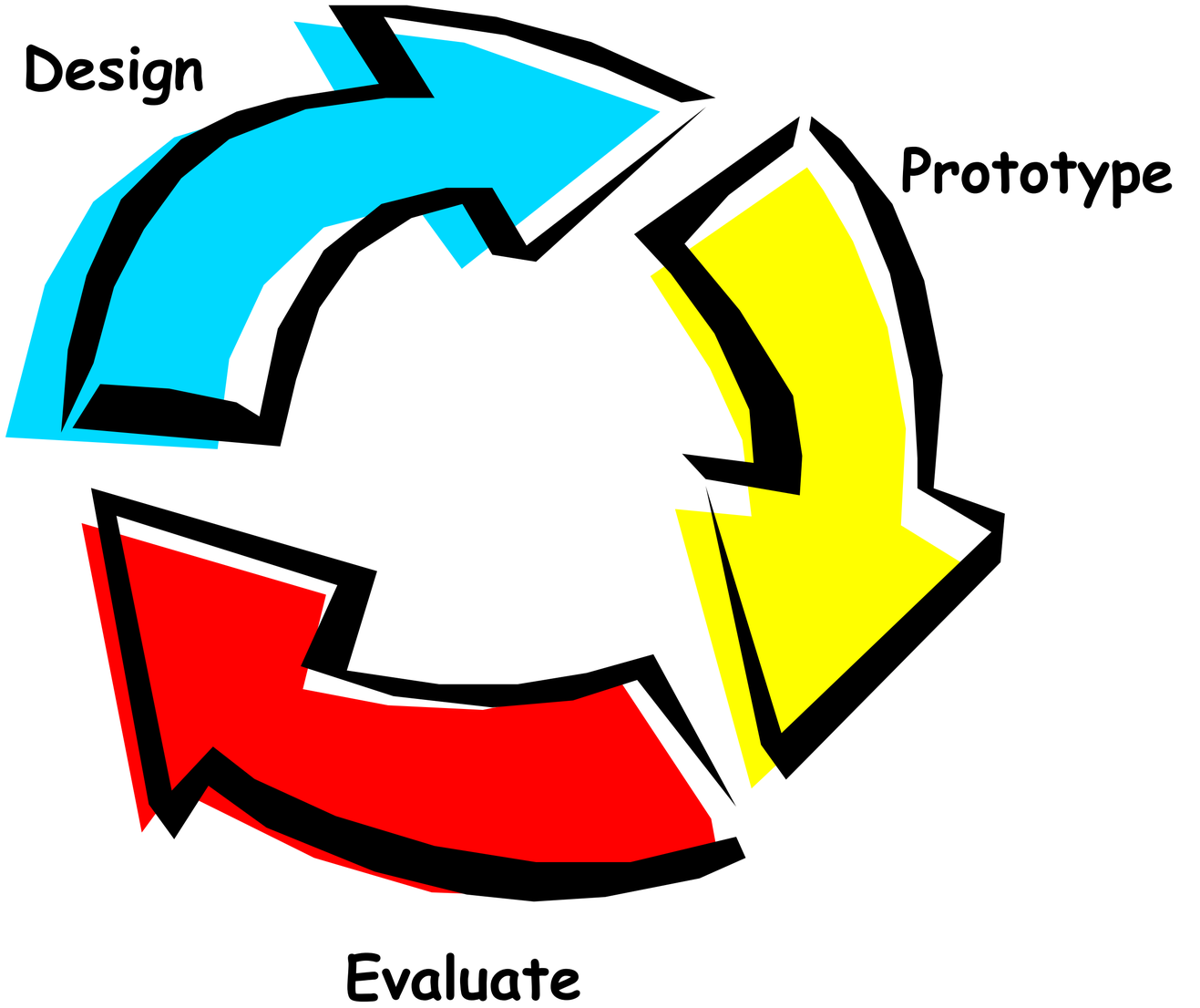
The Design Cycle

Brainstorming

Critique



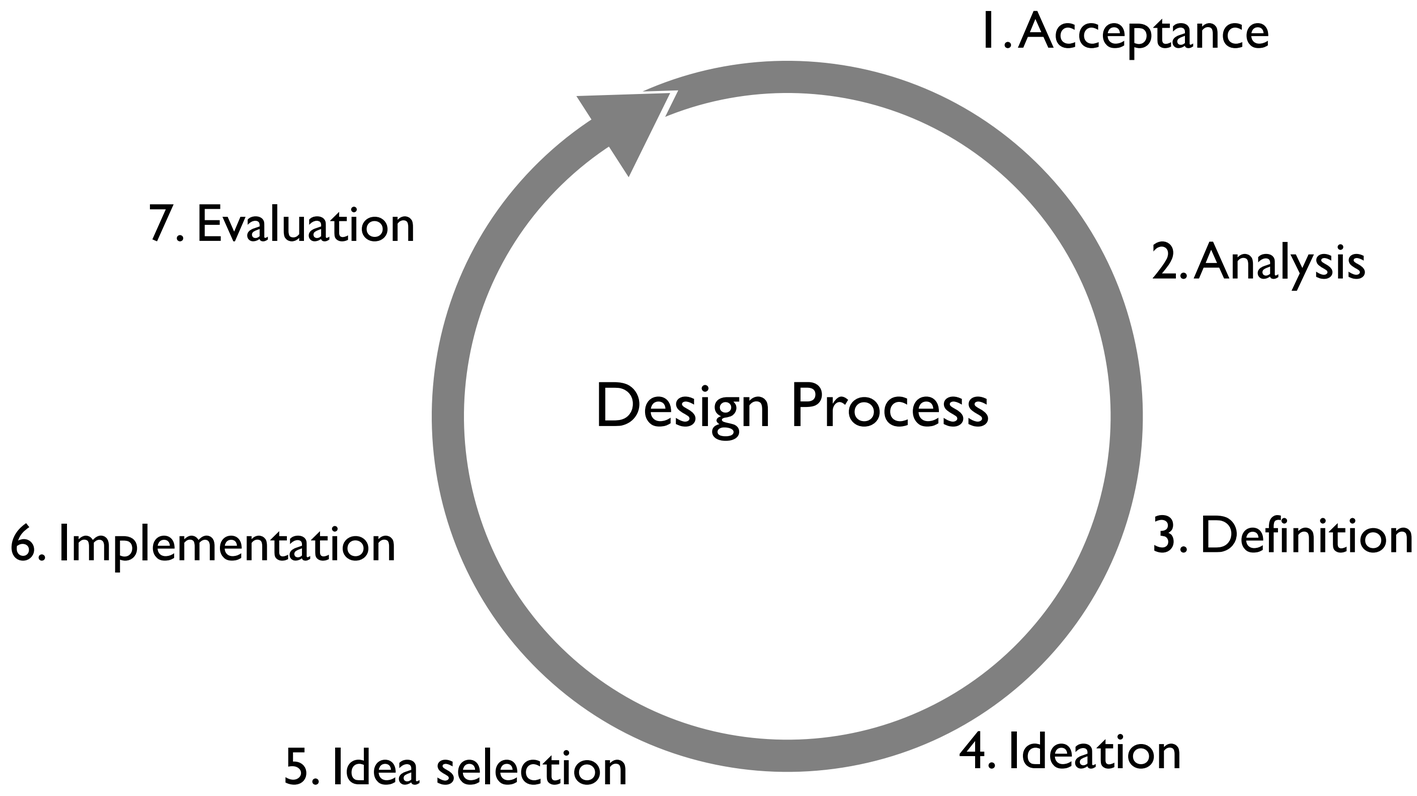
THE DESIGN CYCLE


Design
Prototype
Evaluate

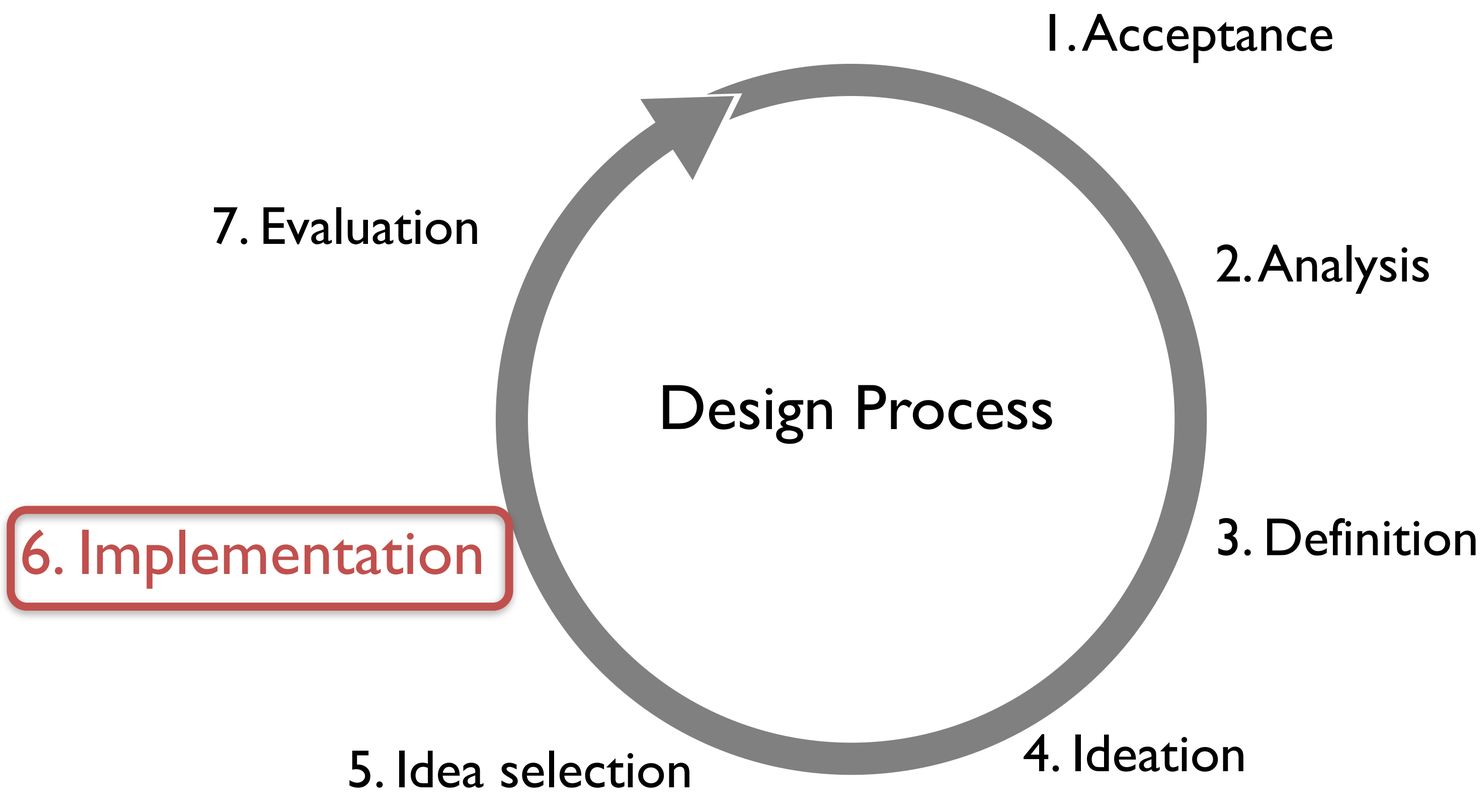
THE ART OF UI DESIGN

A soufflé is eggs, butter, milk & flour, but the difference between soaring and sinking is in the execution.

THE DESIGN PROCESS [KOBERG & BAGNALL]



THE DESIGN PROCESS [KOBERG & BAGNALL]



ACCEPTANCE

Getting started

Because of a deadline

Because of possible reward

Because you are forced to

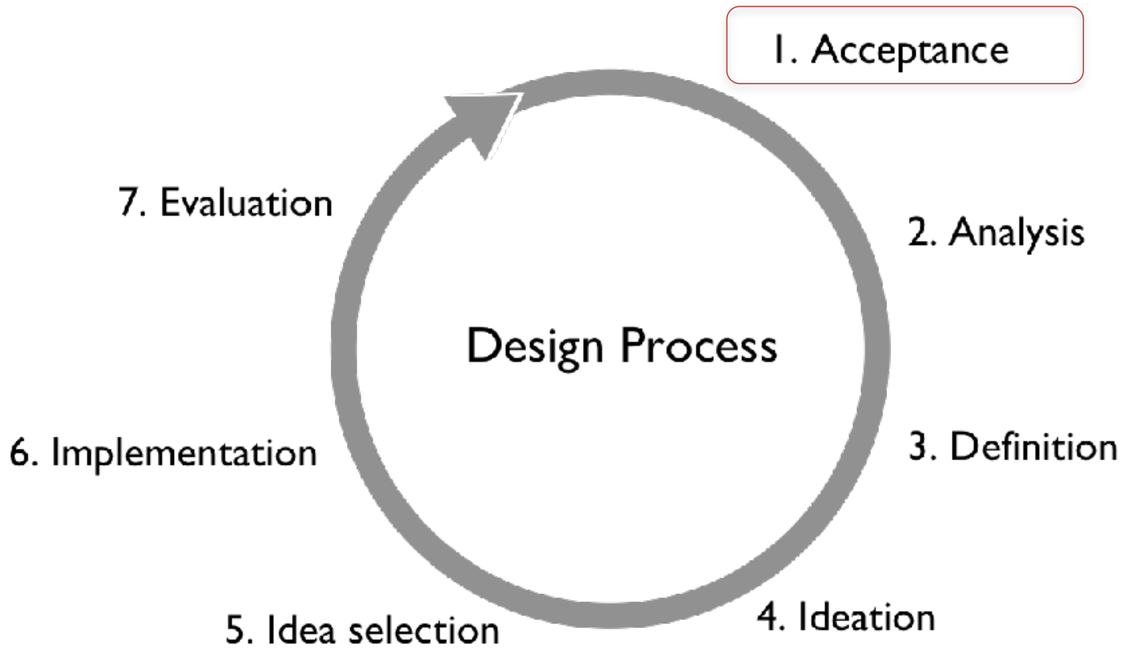
Commitment

Time

Resources

Responsibility

Key is to set motivation



ANALYSIS

Understand Users and Tasks

Who are the users?

What are their tasks?

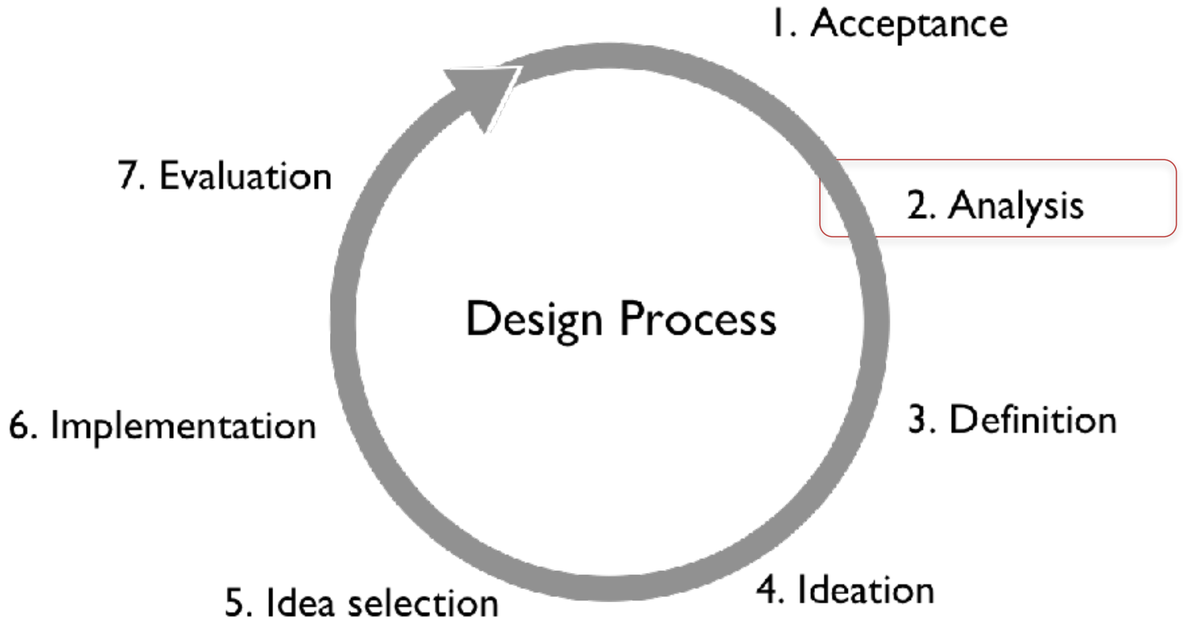
Observe and test, don’t guess

Tools

Notebook

Smartphone:

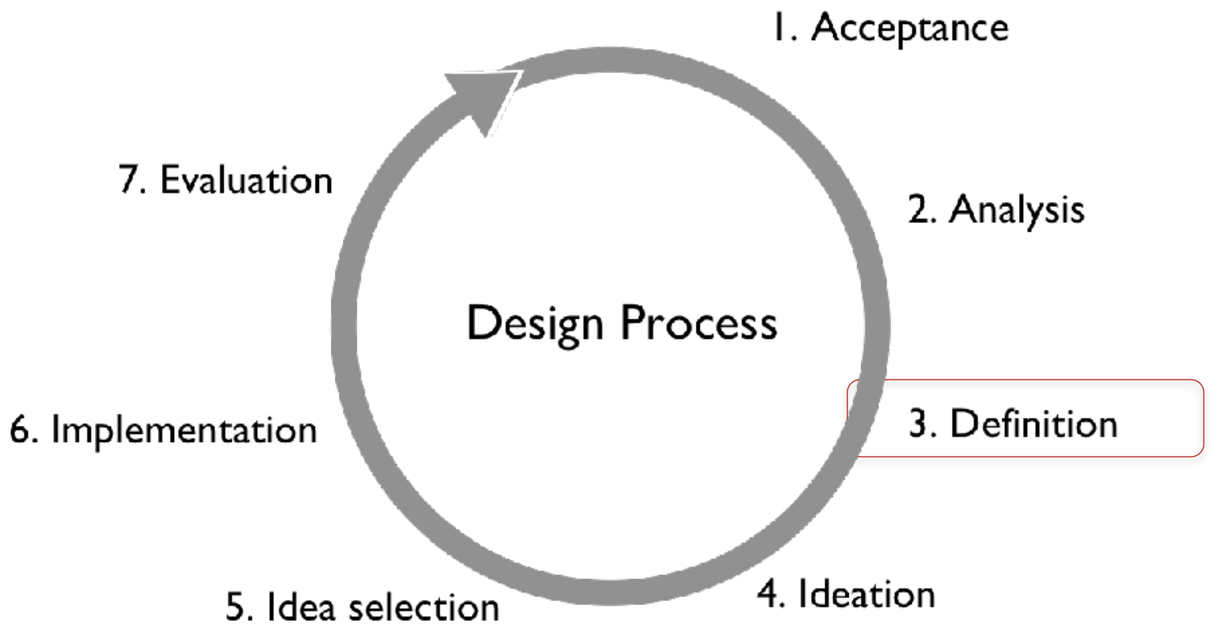
- audio + video recorder
- still camera



DEFINITION

Focus on the problem

Choose appropriate level of detail



Not “bicycle cup-holders”

...but

“helping cyclists to drink coffee without accidents”

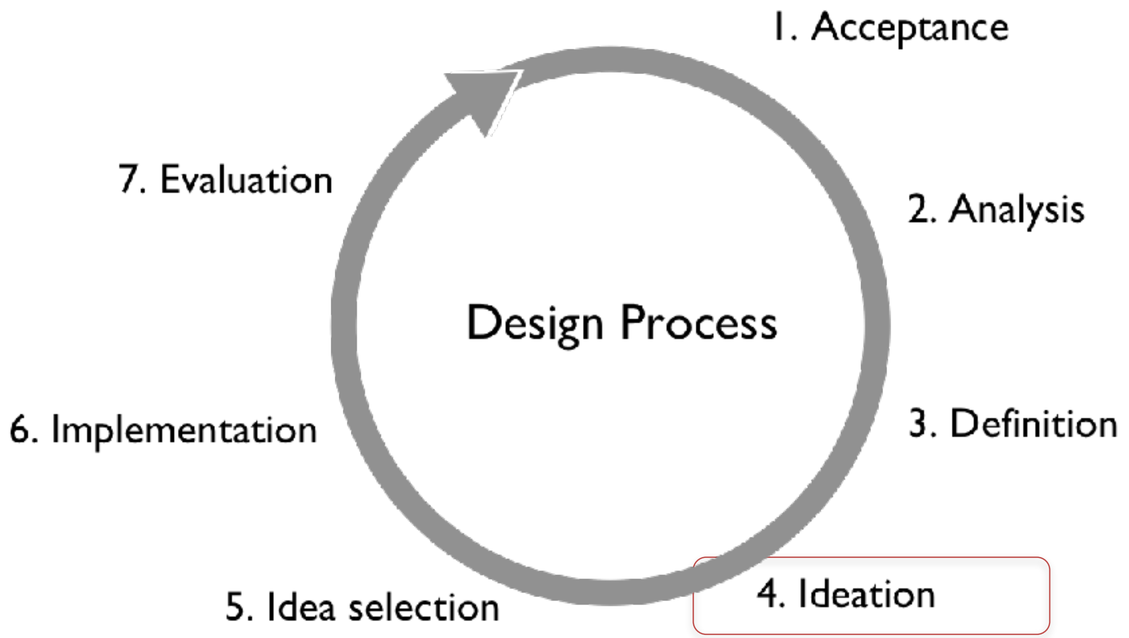
IDEATION

Brainstorming

Stretch mental muscles
Loosen up with simple games
Do homework
Seed with related ideas/objects

Get physical
Sketch
Make models
Act out

IDEO rules
One conversation at a time
Stay focused
Encourage wild ideas
Defer judgment
Build upon idea from others



Aim for quantity!

IDEA SELECTION

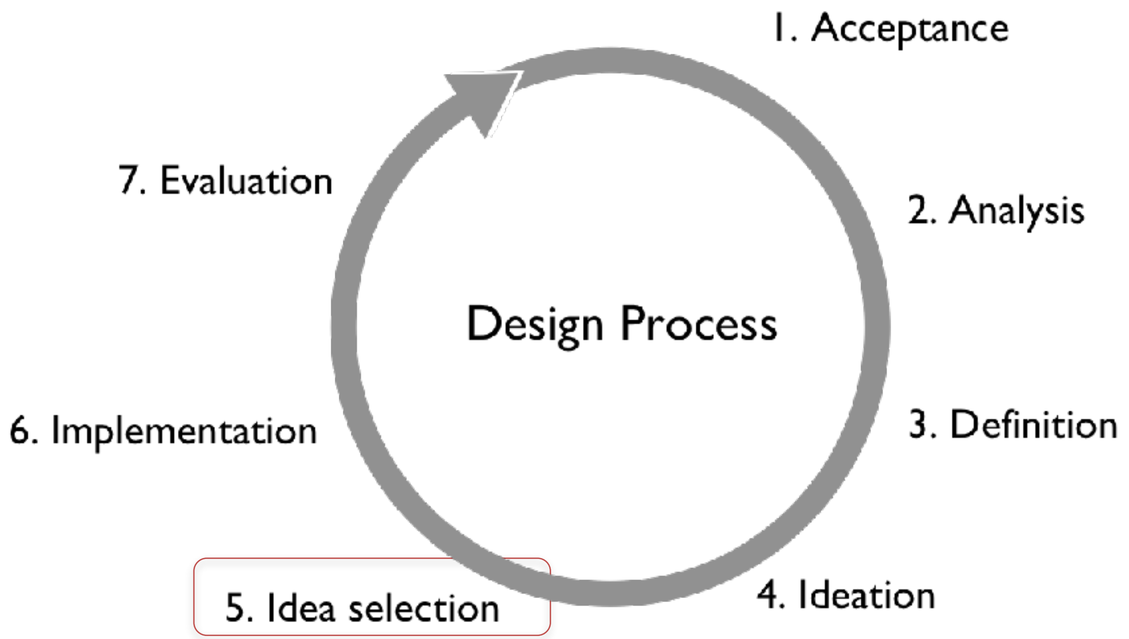
Define importance of each idea

Does it address the problem
Will target users like it
Is hardware available
Is software available
What is the cost
Market window
...

Rank ideas according the your criteria

Pick top N

Choices depend on resources and stage of the project



IMPLEMENTATION

Scale up low → high fidelity

Low-fidelity (quick, cheap, dirty)

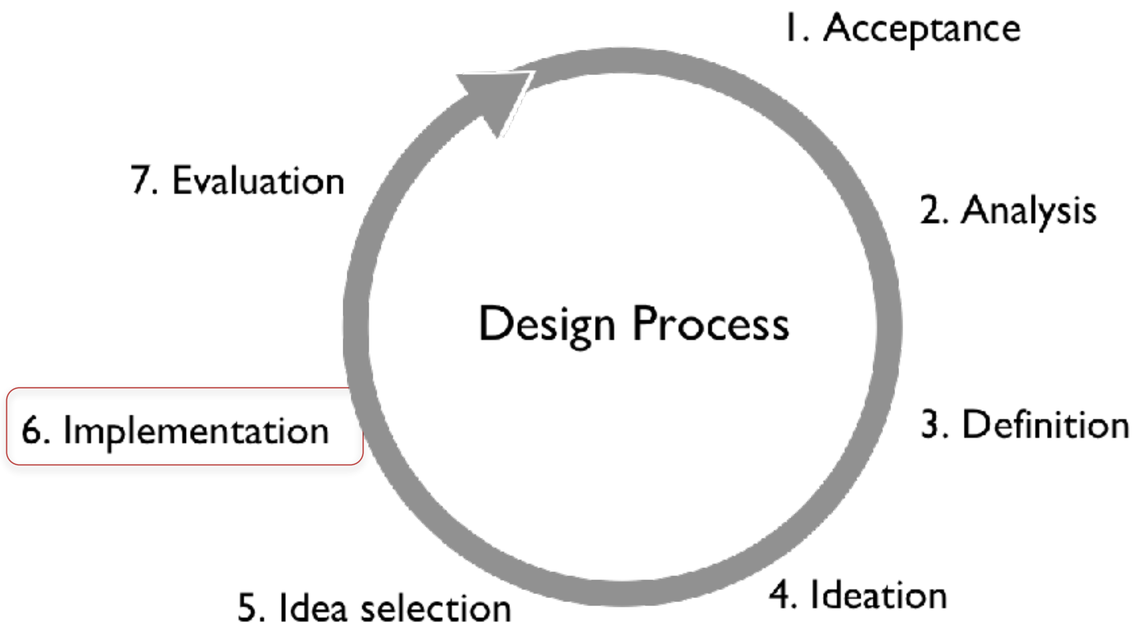
sketches, paper models, foam core, ...

Medium fidelity
(slower, more expensive)

JavaScript, Framer, Figma, Pixate

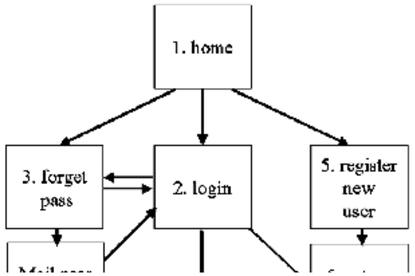
High fidelity
(slowest, most expensive)

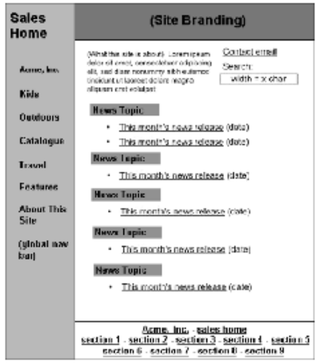
The full interface

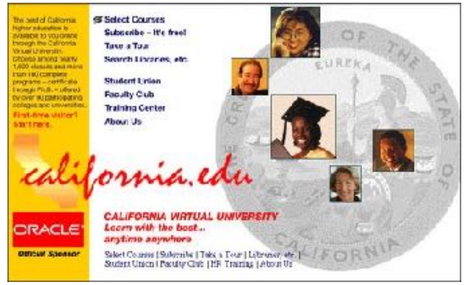


IMPLEMENTATION EXAMPLE: WEB DESIGN

Site Maps → Storyboards → Schematics → Mock-ups



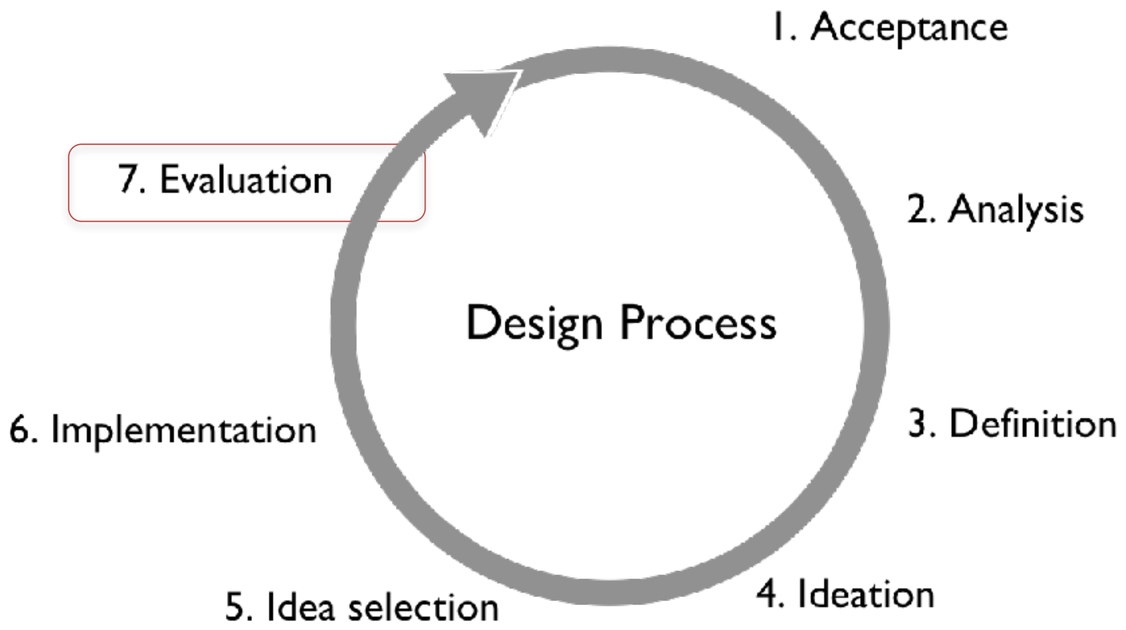




EVALUATION

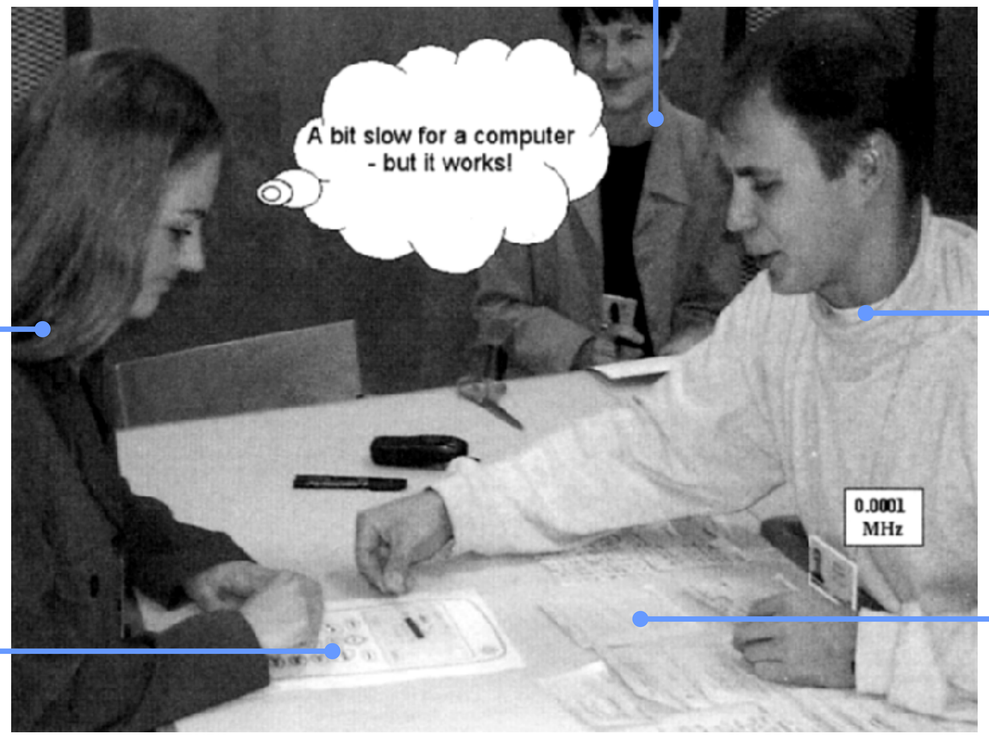
Many types of evaluation

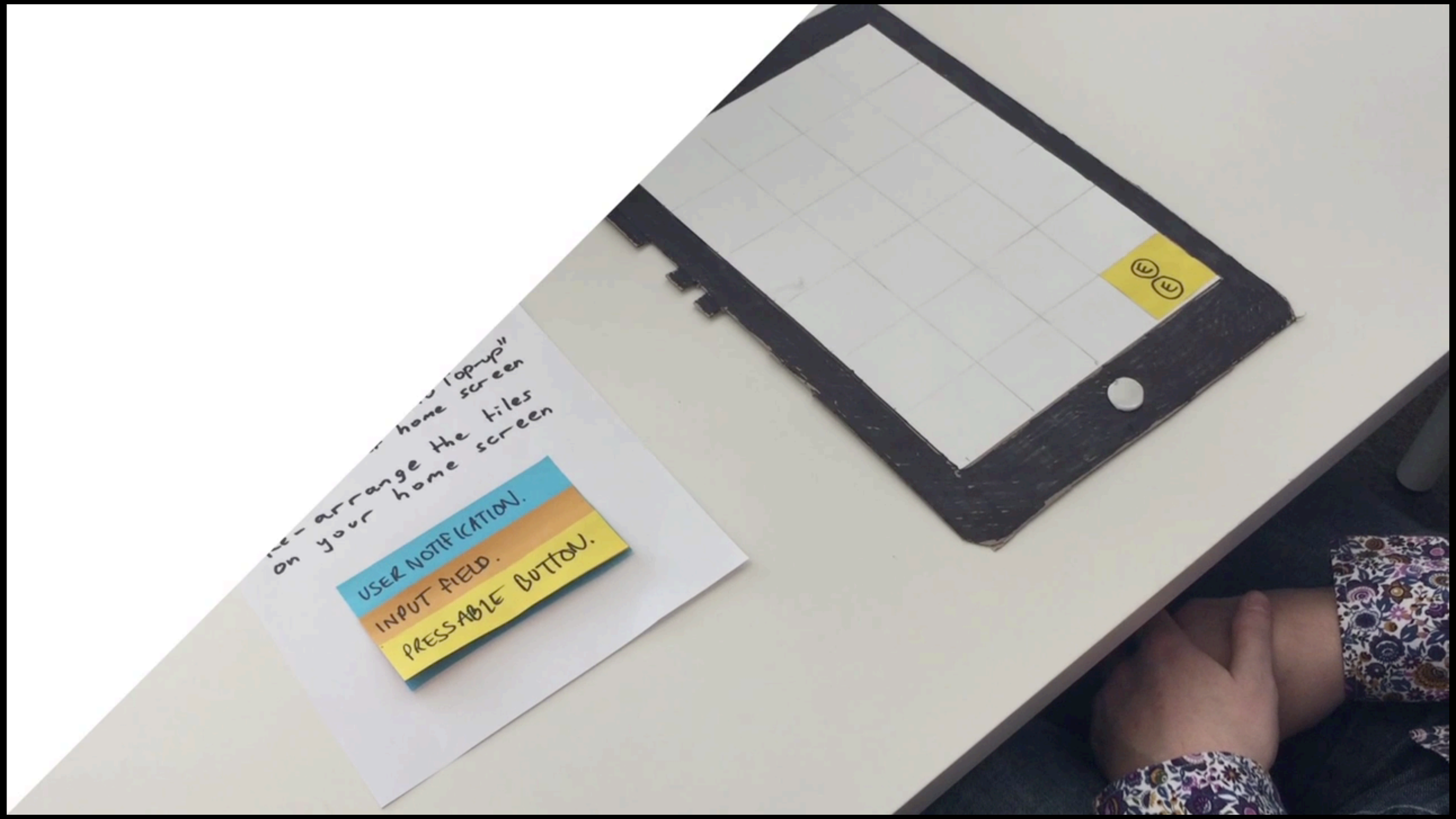
Prototype walkthroughs
Think-aloud studies
Wizard-of-Oz
Performance comparisons



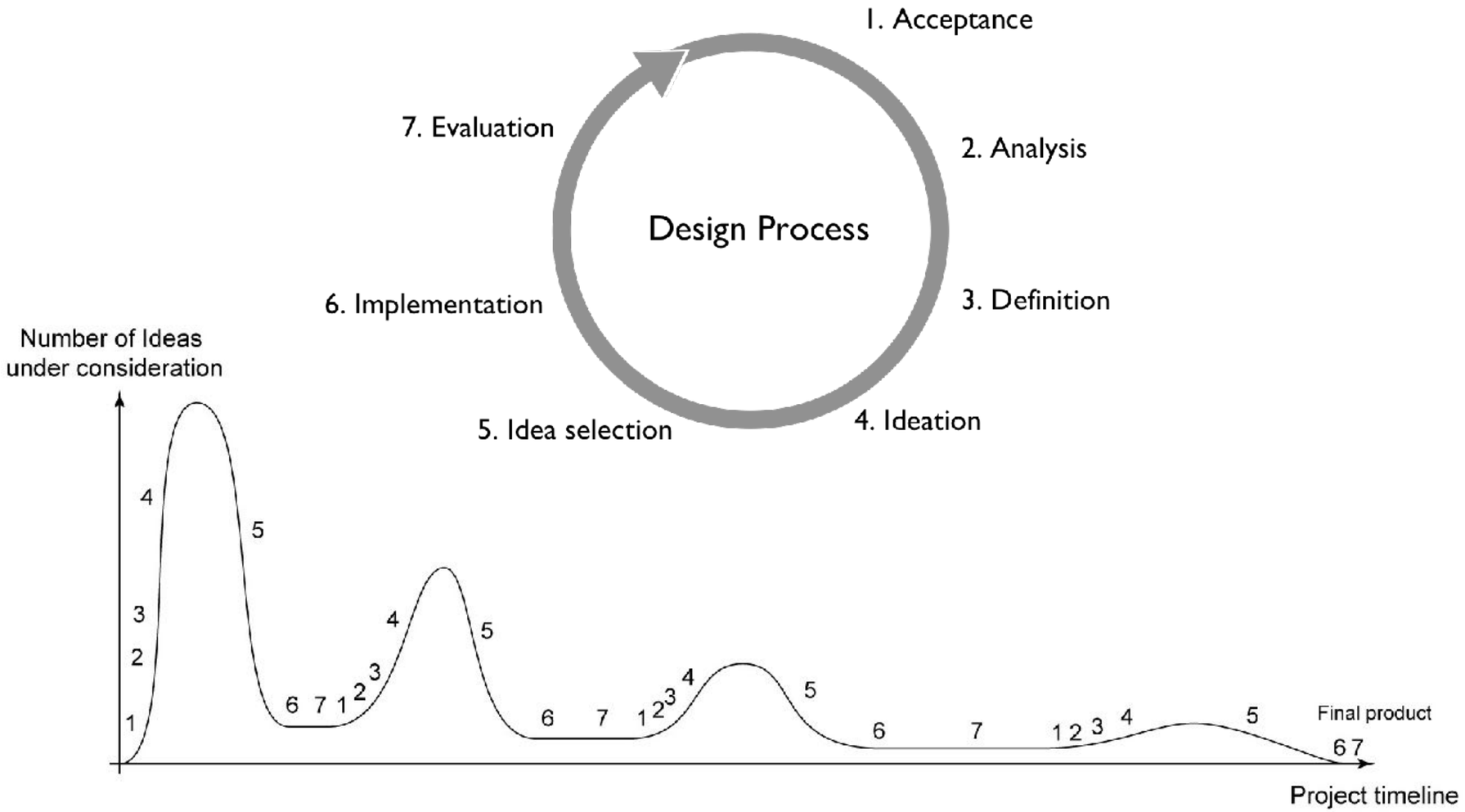
Type of evaluation chosen depends on the level of implementation, etc.

EVALUATION EXAMPLE: PAPER PROTOTYPE WALKTHROUGH

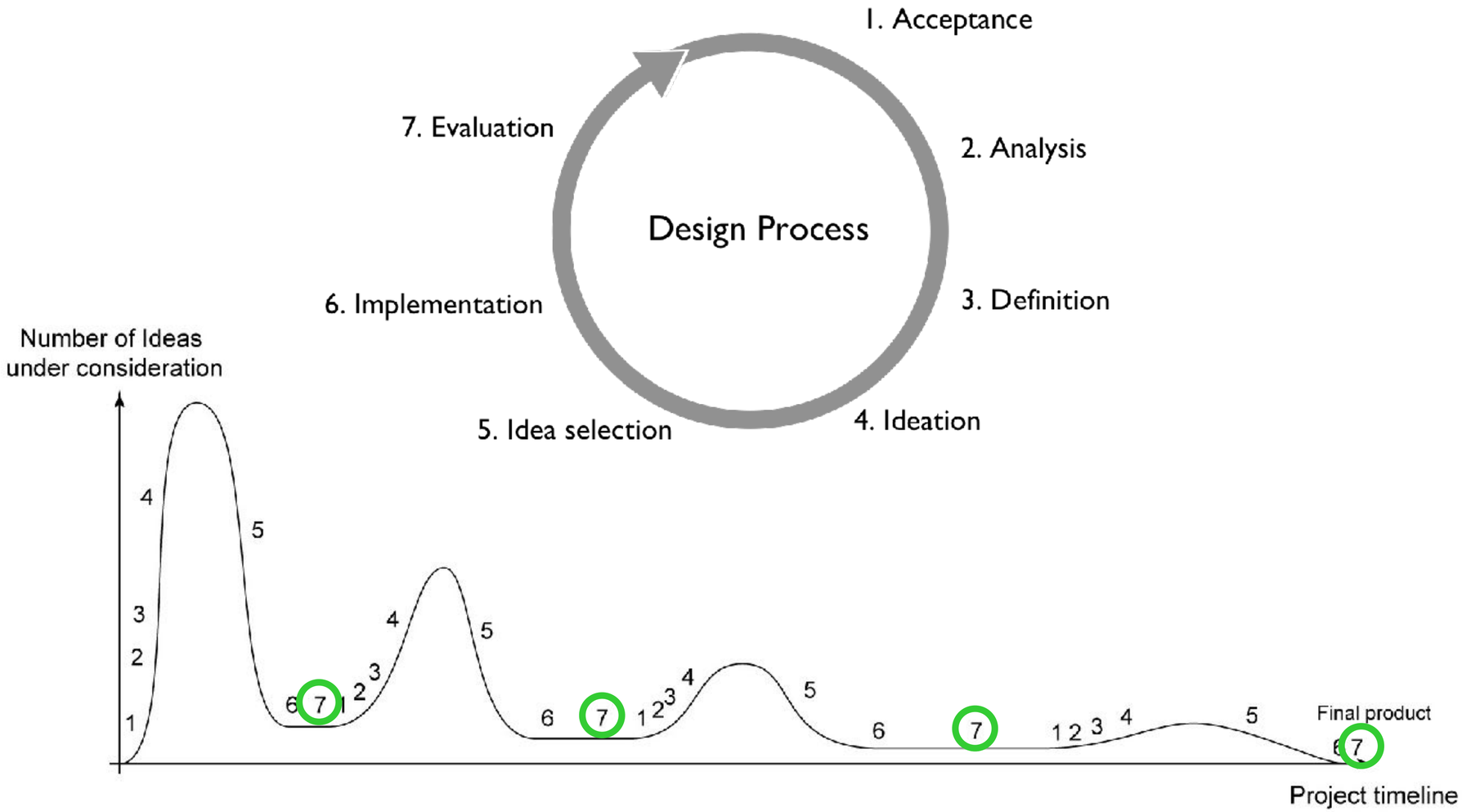



home screen
arrange the tiles
your home screen
USER NOTIFICATION.
INPUT FIELD.
PRESSABLE BUTTON.

DESIGN CYCLE OVER PROJECT LIFESPAN

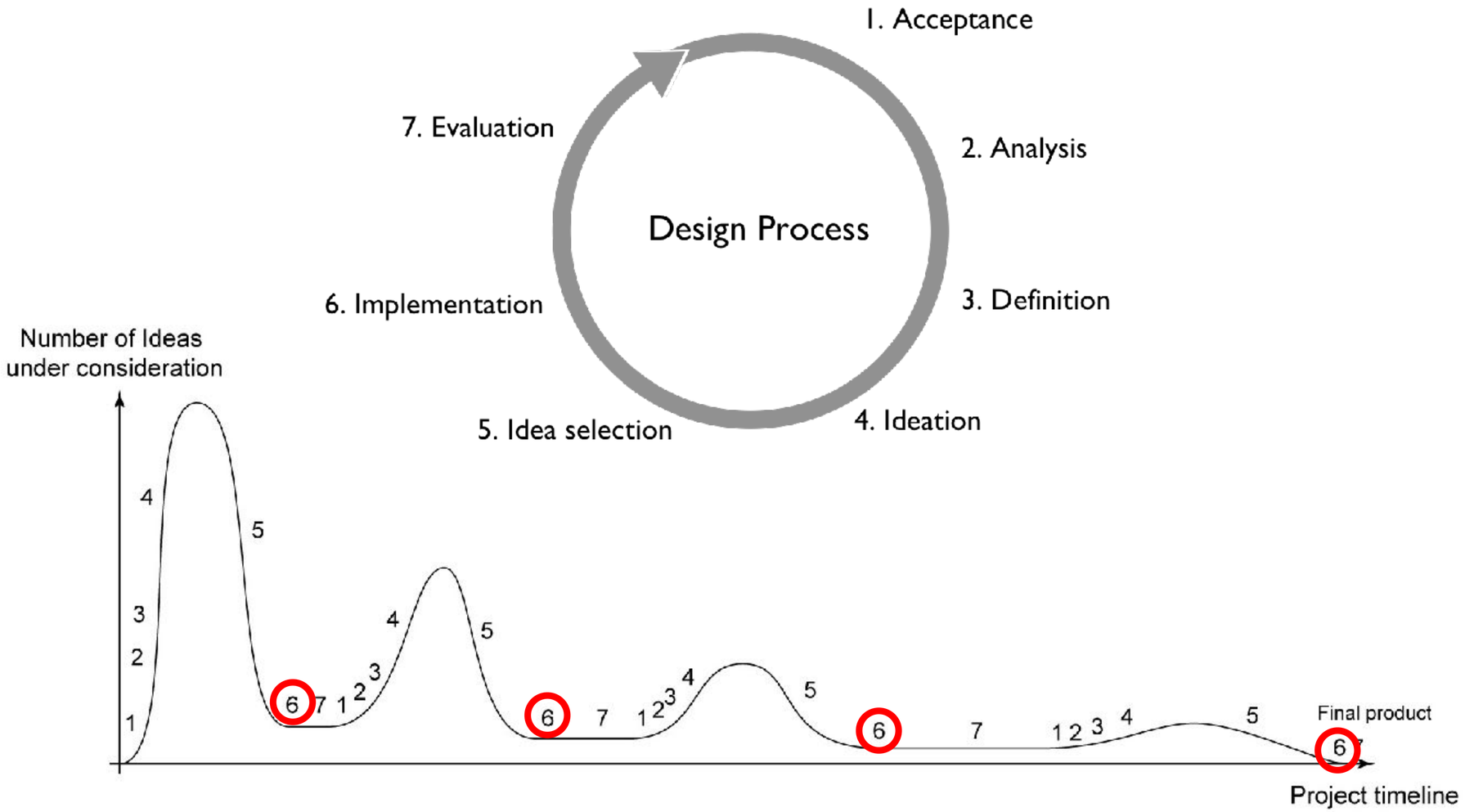


DESIGN CYCLE OVER PROJECT LIFESPAN

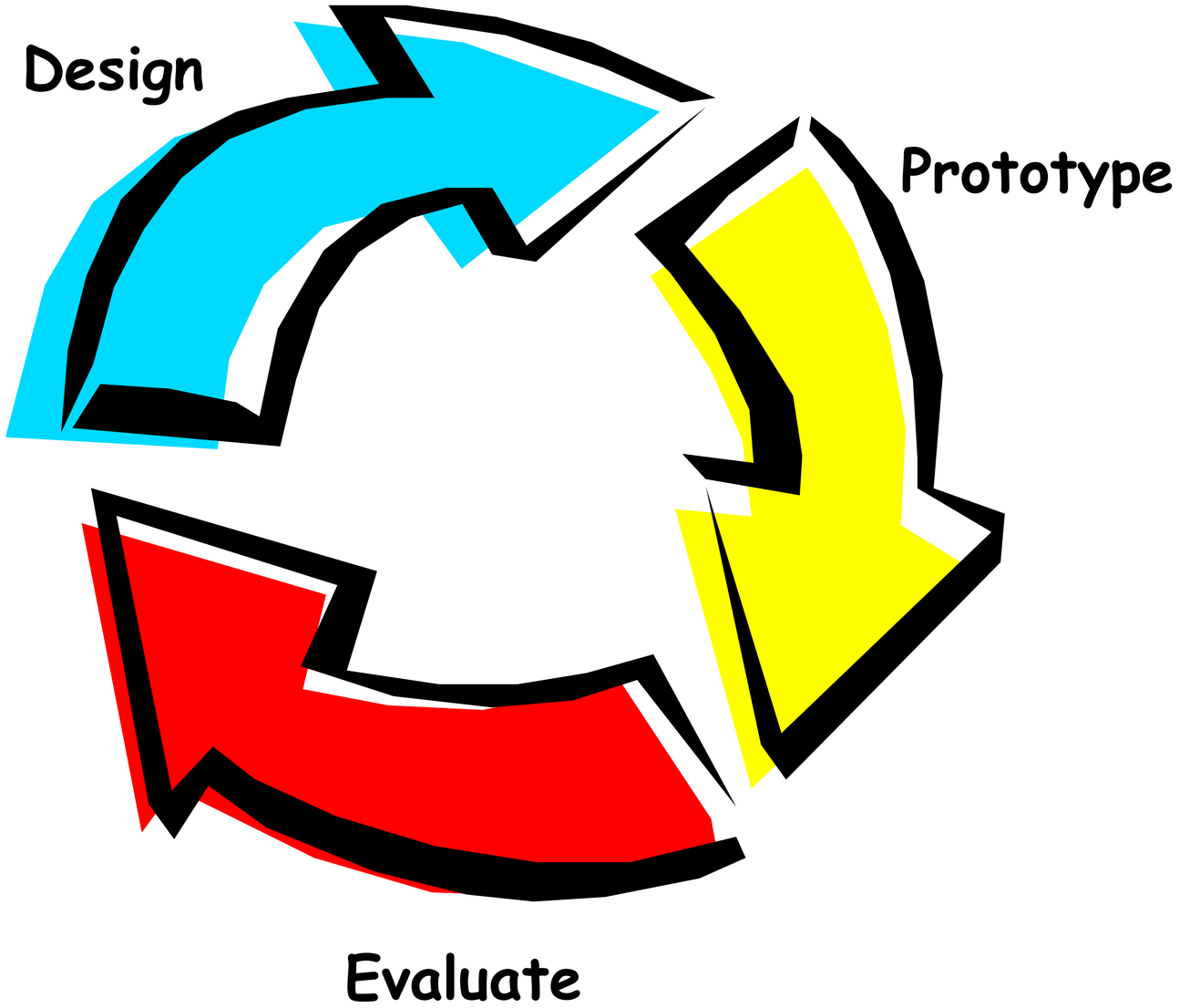


Evaluation reveals problems with design. Re-design requires cycling the process.

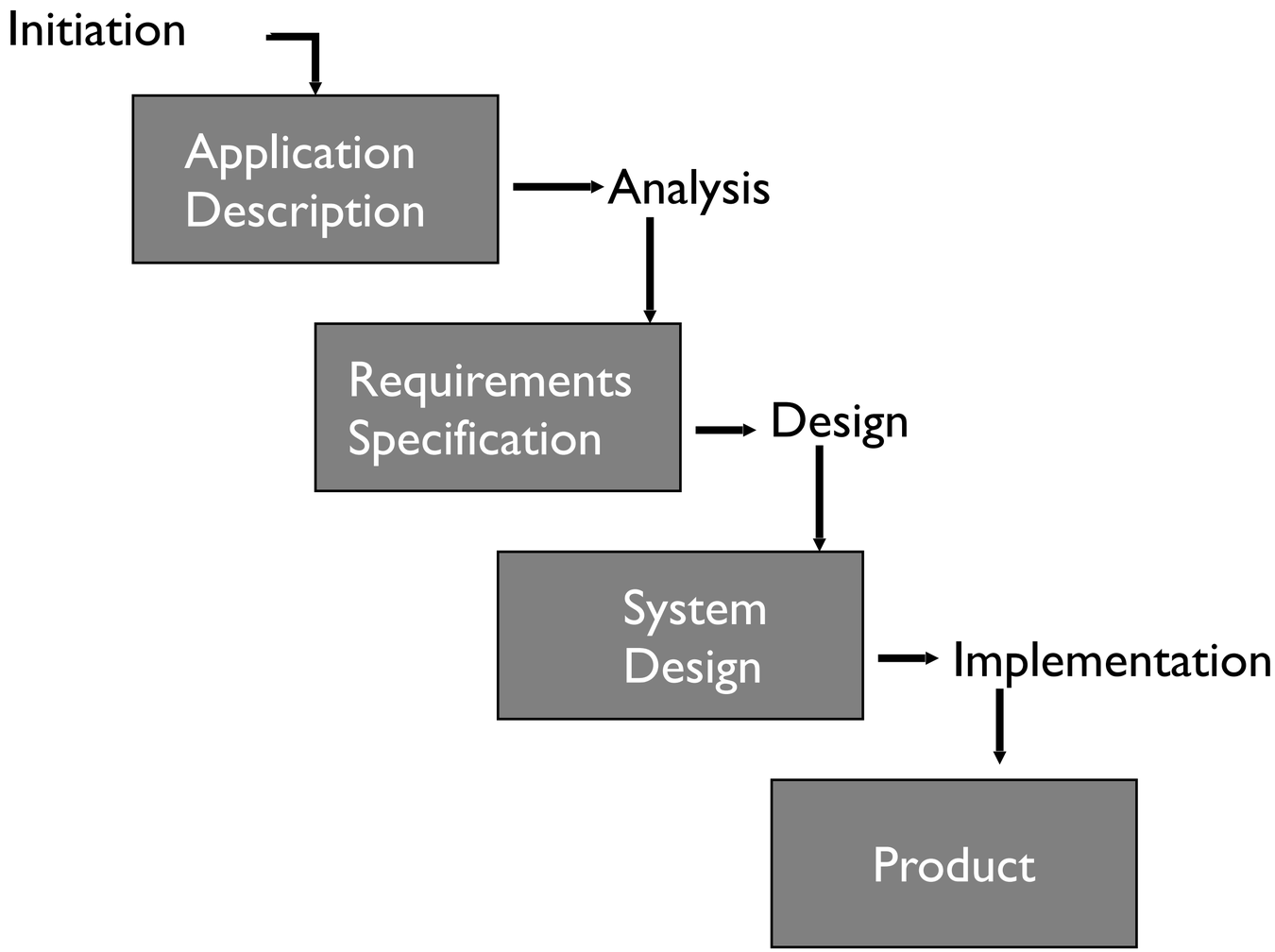
DESIGN CYCLE OVER PROJECT LIFESPAN



Prototype implementations eventually increase in fidelity to reach final product


Design
Prototype
Evaluate

WATERFALL MODEL (SOFT. ENG.)



COMPARISON

Focus differs

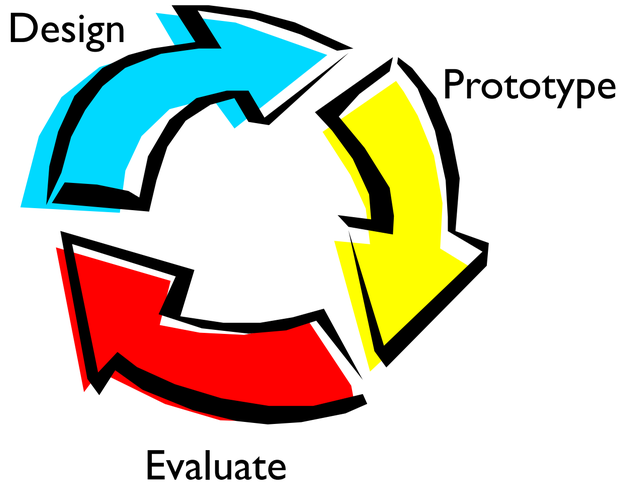
WF has no feedback

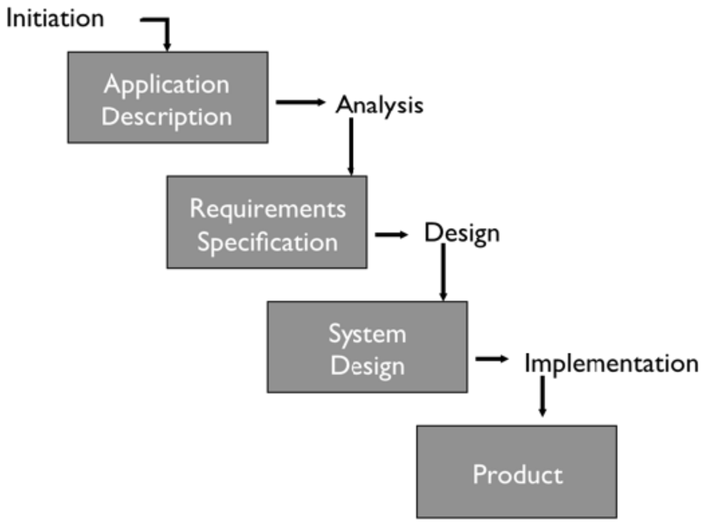
High cost of fixing errors:

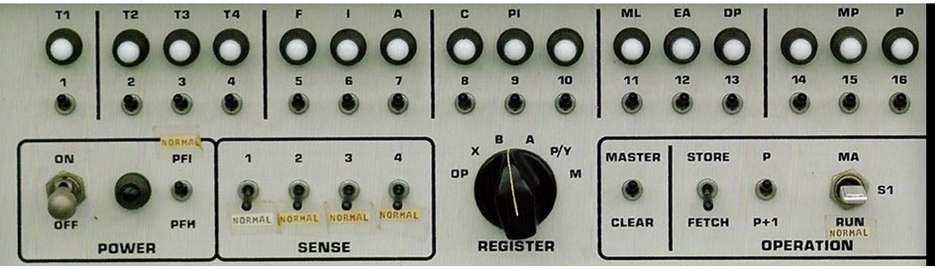
increases by 10x at each stage

Iterative design finds problems earlier

True for modern applications?

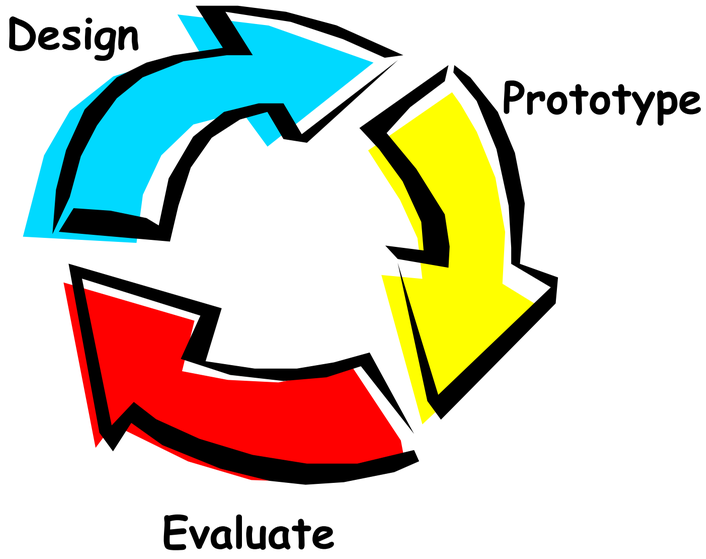






BRAINSTORMING AND CRITIQUE

VIDEO: THE DEEP DIVE

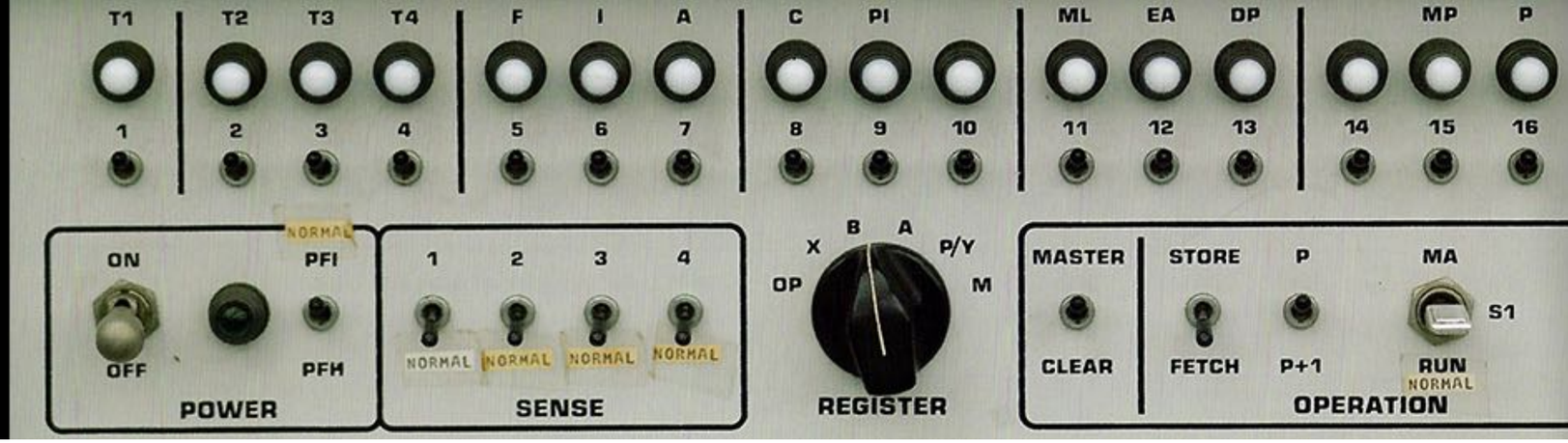


How well do they follow the cycle?
What do they do for each step of the cycle?
How many cycles do you think they went through?

CS160

USER INTERFACE DESIGN

FALL 2018



BRAINSTORMING

ERIC PAULOS
www.paulos.net

UNIVERSITY OF CALIFORNIA Berkeley

THE PSYCHOLOGY OF CREATIVITY

Conformity: the enemy of creativity

Groups and organizations encourage conformity

Part of “brand” or “corporate identity”

CONWAY'S LAW

The structure of a product or design will mirror the internal structure of the organization that creates it

— Conway's Law

THE PSYCHOLOGY OF CREATIVITY

Pressure to conform affects judgment and perception:

The emperor's new clothes

McCarthyism: if you're not one of us, you're one of them...

People in minority will adopt majority opinion and even manufacture their own explanation of it.

CREATIVITY AND DISSENT

Authentic dissenters – people who really disagree with group – can enhance group creativity

Their opinion needn't be right – but they can free the group from stagnant thinking.

The originality of the minority stimulates the majority

DISSENT AND AUTHENTICITY

The benefits of dissent are weakened if

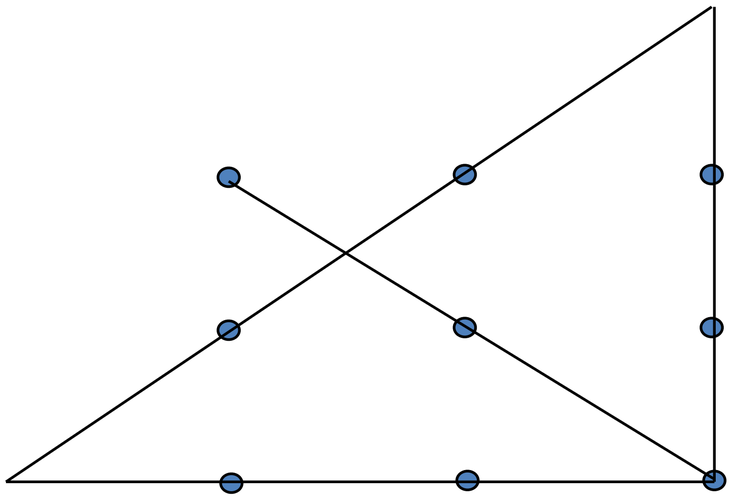
Dissent is not real — A deliberate “devil’s advocate” in the group can actually stifle dissent, because the majority know the opinion is manufactured.

Dissent is not encouraged — Polite or pro-forma acceptance is not enough.

ENHANCING CREATIVITY

Thinking outside the box:

Draw a series of 4 straight lines through all the points below, without lifting pen from paper:

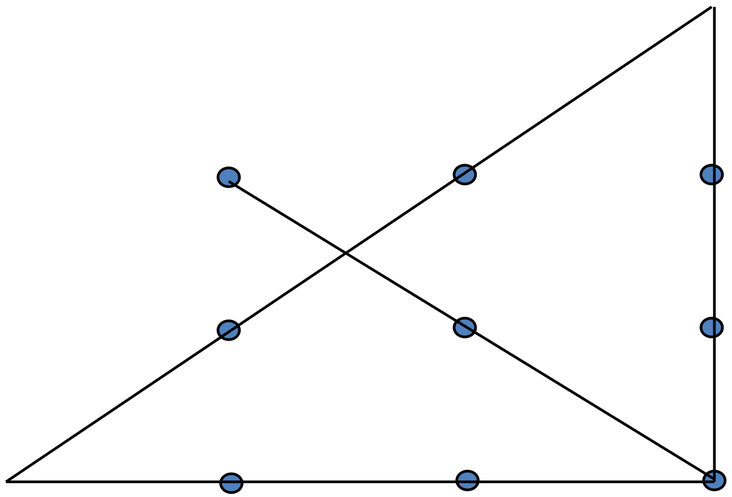


WHY IS THIS HARD?

We adopt expectations about the solution

Based on conventions

Based on what we believe the questioner expects



IDEO’S BRAINSTORMING RULES

1. Defer judgement.
2. Encourage wild ideas.
3. Build on the ideas of others.
4. Stay focused on the topic.
5. One conversation at a time.
6. Be visual.
7. Go for quantity.

SHARPEN THE FOCUS

Posing the right problem is critical – neither too narrow, nor too fuzzy

Not “bicycle cup-holders” but “helping cyclists to drink coffee without accidents”

NUMBER YOUR IDEAS

Obvious but very useful

Helps keep track of them when the brainstorm is successful (and 100 or more ideas are in play)

Allows ideas to take on an identity of their own

BUILD AND JUMP

Build to keep momentum on an idea:

“shock absorbers are a great idea; what are other ways to reduce coffee spillage on bumps?”

Jump to regain momentum when a theme tapers out:

“OK, but what about hands-free solutions?”

CONCEPT REFINEMENT

Premature idea rejection is a serious barrier to good design.

One big differentiator between good designers and great ones is the latter’s ability to successfully develop unusual ideas

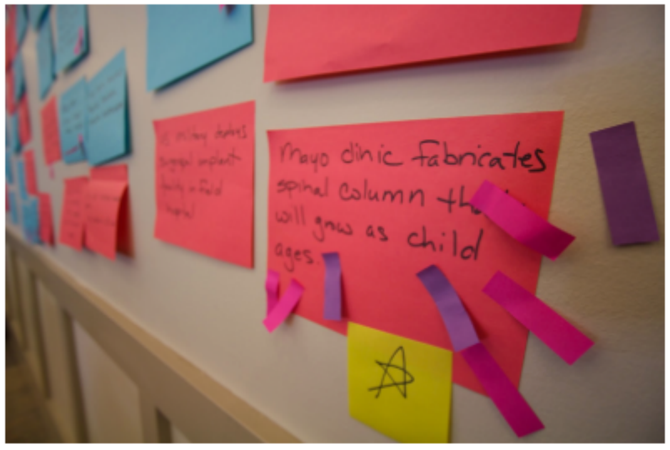
This requires a strong instinct to be able to distinguish fatal vs. minor flaws in an idea

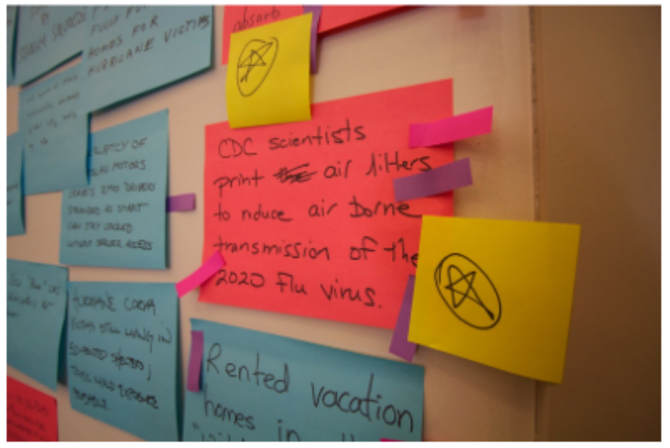
THE SPACE REMEMBERS

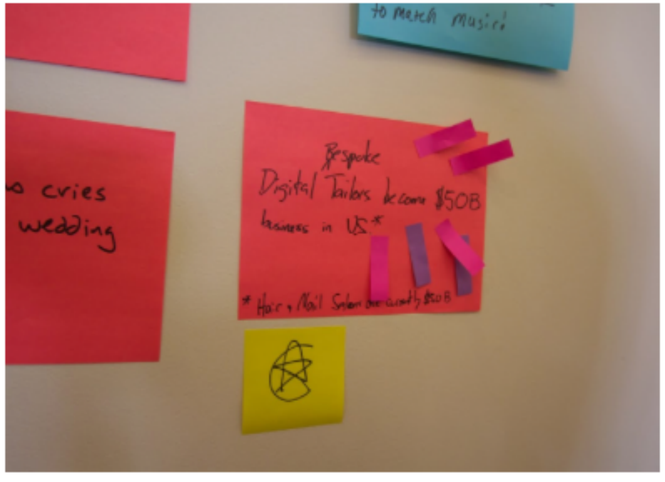
Covering whiteboards or papering walls with text is extremely useful in group work.

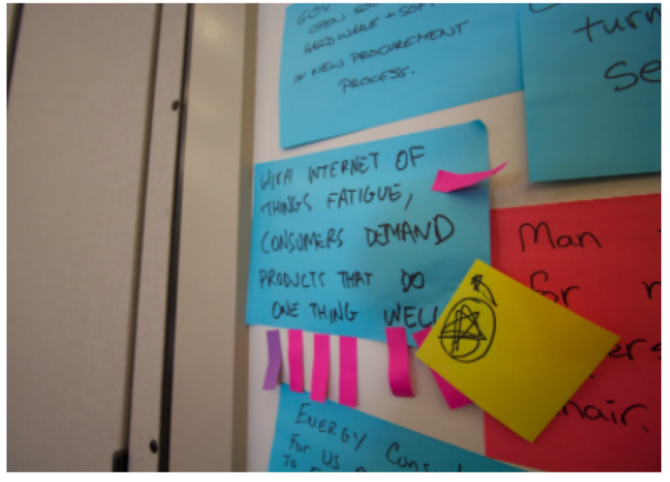
It’s a very effective form of external (RAM) memory for group

Even better, its shared RAM. Helps group share understanding


Mayo clinic fabricates
spinal column th
will grow as child
ages.


CDC scientists
print air filters
to reduce air borne
transmission of the
2020 flu virus.
Rented vacation


to match music!
Bespoke
Digital Tailors become $50B
business in US*
* Hair + Nail Salon


WITH INTERNET OF
THINGS FATIGUE,
CONSUMERS DEMAND
PRODUCTS THAT DO
ONE THING WELL


Bioluminescent trees
save city thousands
on illumination bill,
absorb traffic noise

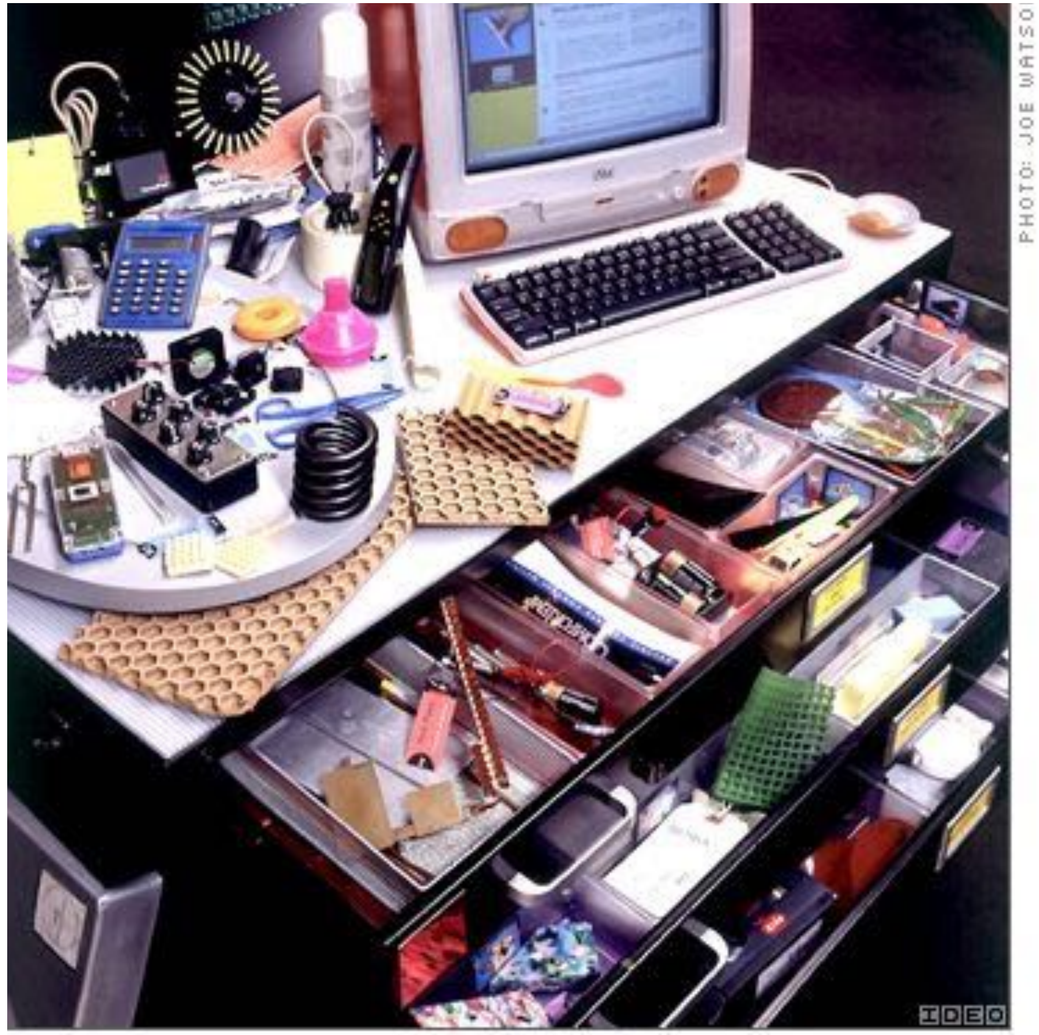

GENETIC ALGORITHM
WINS FURNITURE DESIGN
COMPETITION

STRETCH YOUR MENTAL MUSCLES

Warm-ups: word games, puzzles

Get immersed in the domain: go visit the toy shop, or the bicycle shop, phone shop etc...

Props: Bring some examples of the technology to the brainstorm



GET PHYSICAL

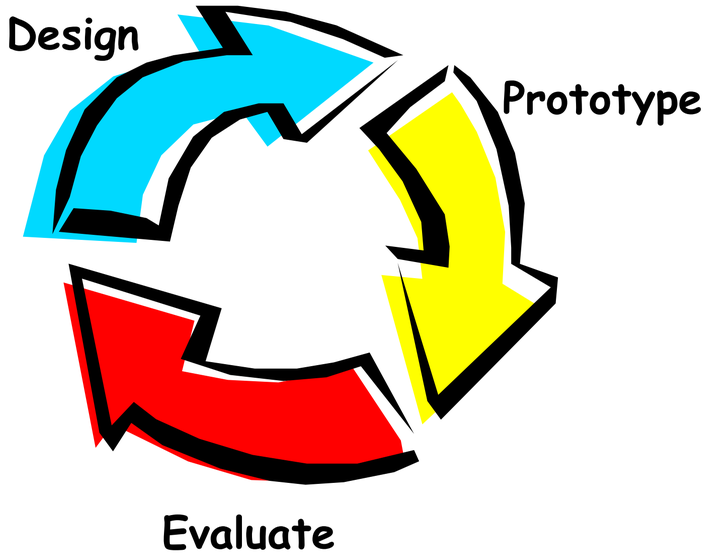
Sketch

Make models

Act out

Perform

VIDEO: THE DEEP DIVE



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