THE DESIGN CYCLE

25 JAN 2016

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UNIVERSITY OF CALIFORNIA Berkeley

ANNOUNCEMENTS

Due Next Thur– Reading Response

Due 3 Feb (before class) – DESIGN 01

Due 5 Feb (Fri) – PROG 01

Enrollment

Late reading responses

Screen Record PROG 01

What Section will you Attend?

Vote on Piazza

SECTIONS MOVING FORWARD

Vote on Piazza


piazza
Ask. Answer. Explore. Whenever.

CLASS WEBSITE: HCI.BERKELEY.EDU/CS160

Home Showcase Requirements Grading Syllabus bCourses Piazza

ATTENTION: First day of class 20 Jan 2:30pm in 310 Jacobs Hall

Course Description

CS160 is an introduction to Human Computer Interaction (HCI). You will learn to prototype, evaluate, and design a user interface. You will be expected to work within a group of four or five students in this project-based course. Your project topic will be proposed by your group and your project design and implementation will follow a human-centered process. The final result will be an interactive prototype of a novel user experience carefully tailored to the needs of your intended users.

In contrast to most of the other CS classes at Berkeley, CS160 does not primarily focus on particular algorithmic techniques or computer technologies. Instead, the focus of the course is on developing a broad set of skills needed for user-centered design. These skills include ideation, needs assessment, communication, rapid prototyping, algorithmic implementation and evaluation.

Useful Links

- Android Recommendation List
- Android Studio & Genymotion Installation Guide

CS160

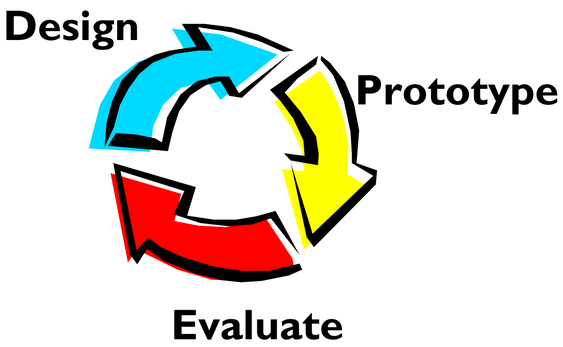
Lectures: Mon+Wed 2:30PM - 4:00PM in 310 Jacobs Hall
Instructor: Professor Eric Paulos
Contacting GSIs: via Piazza
Midterm Exam: 16 March 2:30-4pm
Public Showcase: TBD during RRR week 2-6 May in 310 Jacobs
Final Presentations: TBD
Final Materials 6 May at 11:59PM

Course Staff

	Office Hour	Section
Diane Wang	M 12 - 1 P/220 JACOBS	TBD/TBD
Shana Hu	M 130 - 230 P/220 JACOBS	TBD/TBD
Eric Paulos	T 10 - 11 A/210B JACOBS	
Peggy Chi	T 1 - 2 P/510 SODA	TBD/TBD
Jingyi Li	W 5 - 6 P/651 SODA	TBD/TBD
Jasper O' Leary	F 10 - 11 A/210 JACOBS	TBD/TBD
Sarina Gross	-	-

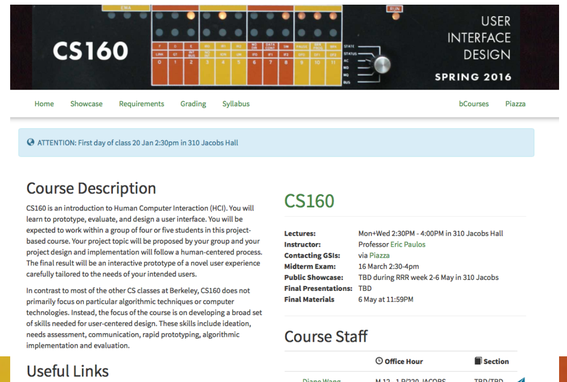
REVIEW

Course overview



Project theme

Course mechanics



DUE WEDNESDAY: NEXT READING RESPONSE

RR 02

Published | Edit

READING:

History of the Smart Watch Literature Review

Smartwatch History.pdf

Prompt:

Numerous challenges from engineering to user experience affect the smart watch. Describe three issues (technical, hardware, processing, or UI) and how they have been addressed (or not) by the current offering of smart watches. You can answer this question in a medium of your choice (with words, a comic, a diagram, or another creative way).

DESIGN 01: WATCH IN THE WILD: DUE 10 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

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 succinctly and clearly describe what you learned from your conversations? (3pts)
- Did you brainstorm at least 12 ideas? (5pts)
- Did you make a prototype and describe it in your submission (w/ photos)? (5pts)
- Did you test your prototype with a user? (5pts)
- Did you write down a list of insights from the test? (5pts)

PROG 01: CRUNCH TIME: DUE 5 FEB

PROG 01: Crunch Time

Published | 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 **calorie burning conversion** app to accomplish these goals.

New year, new me, the saying goes. And what better path of self improvement for us tired, constantly coding college students to take than the one of personal health and fitness? For this assignment, you'll be making an application which, given an input of **the type and amount of exercise**, you'll be able to see how many **calories** you've burned as well as the **equivalent amount of another type of exercise**. For example, let's say you did 350 pushups (starting the year off strong!). You'd give the app 350 pushups as input, and it would output that you've burned 100 calories. 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

HELP WITH PROGRAMMING ASSIGNMENT

Office Hours

Sections

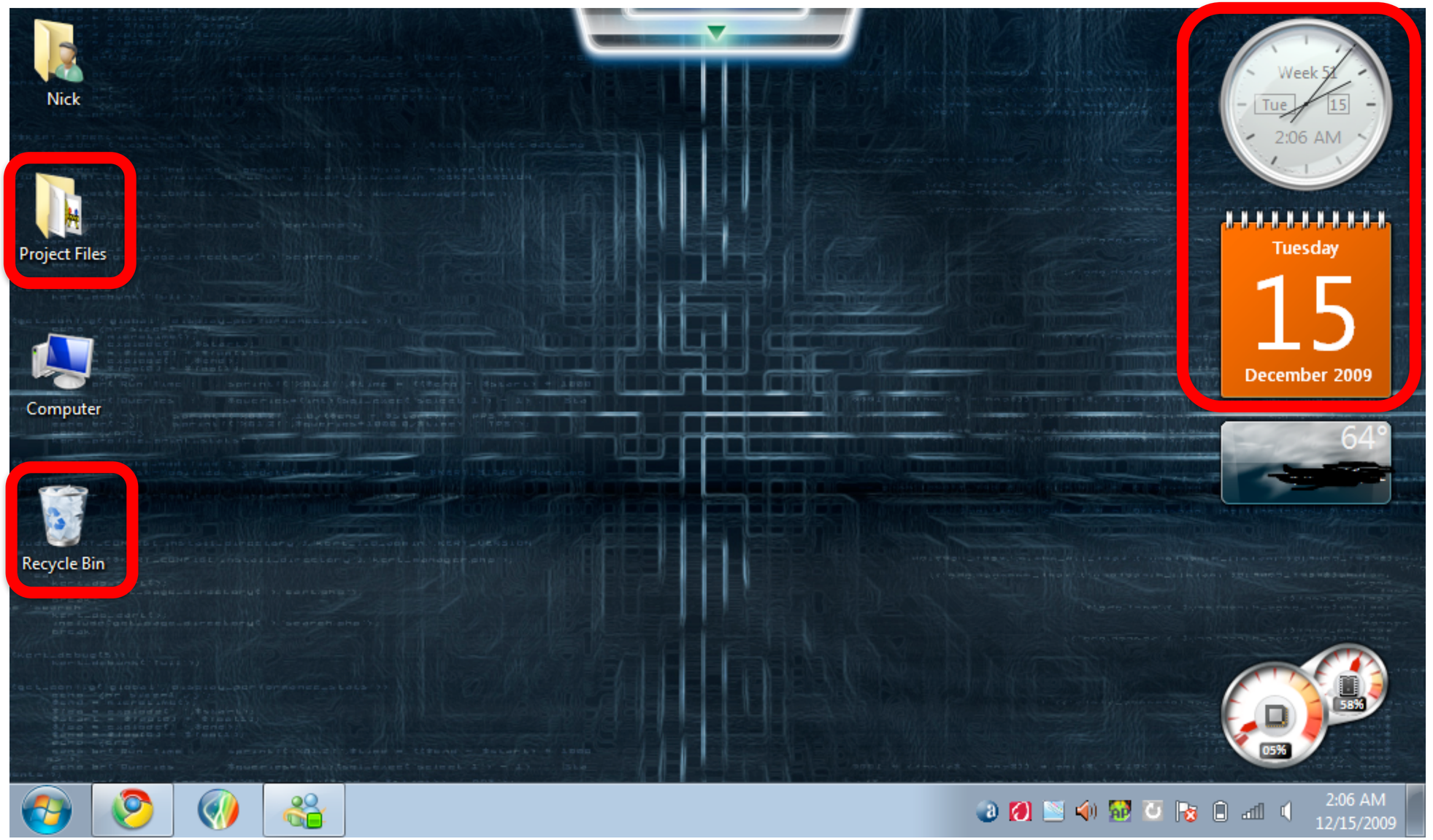
Recommended:

Follow the official Android tutorials

Building Your First App

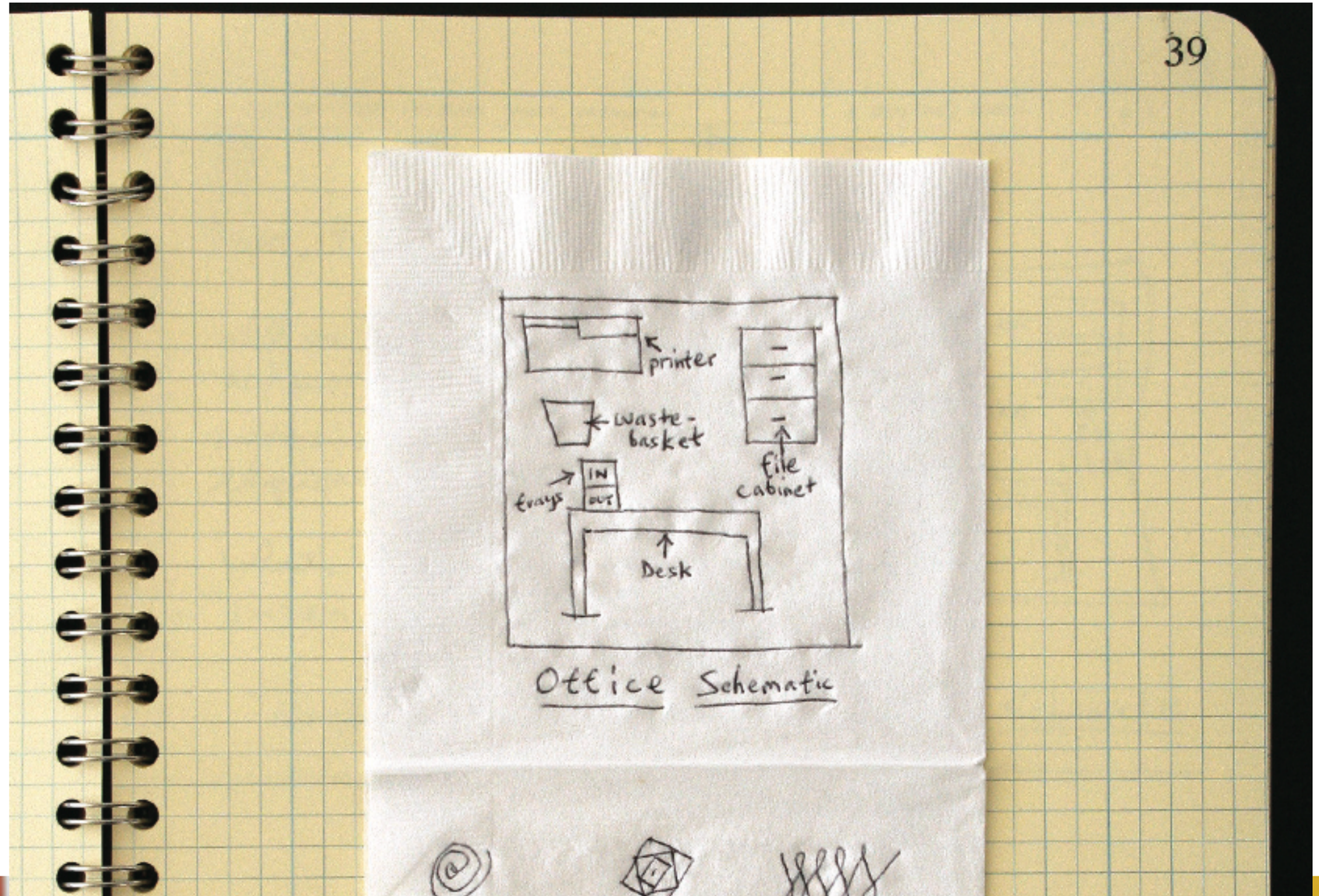
LOOKING AT INTERACTION DESIGNS

http://stackoverflow.com/questions/238177



Windows 7 - http://i47.tinypic.com/2zp1kzt.jpg

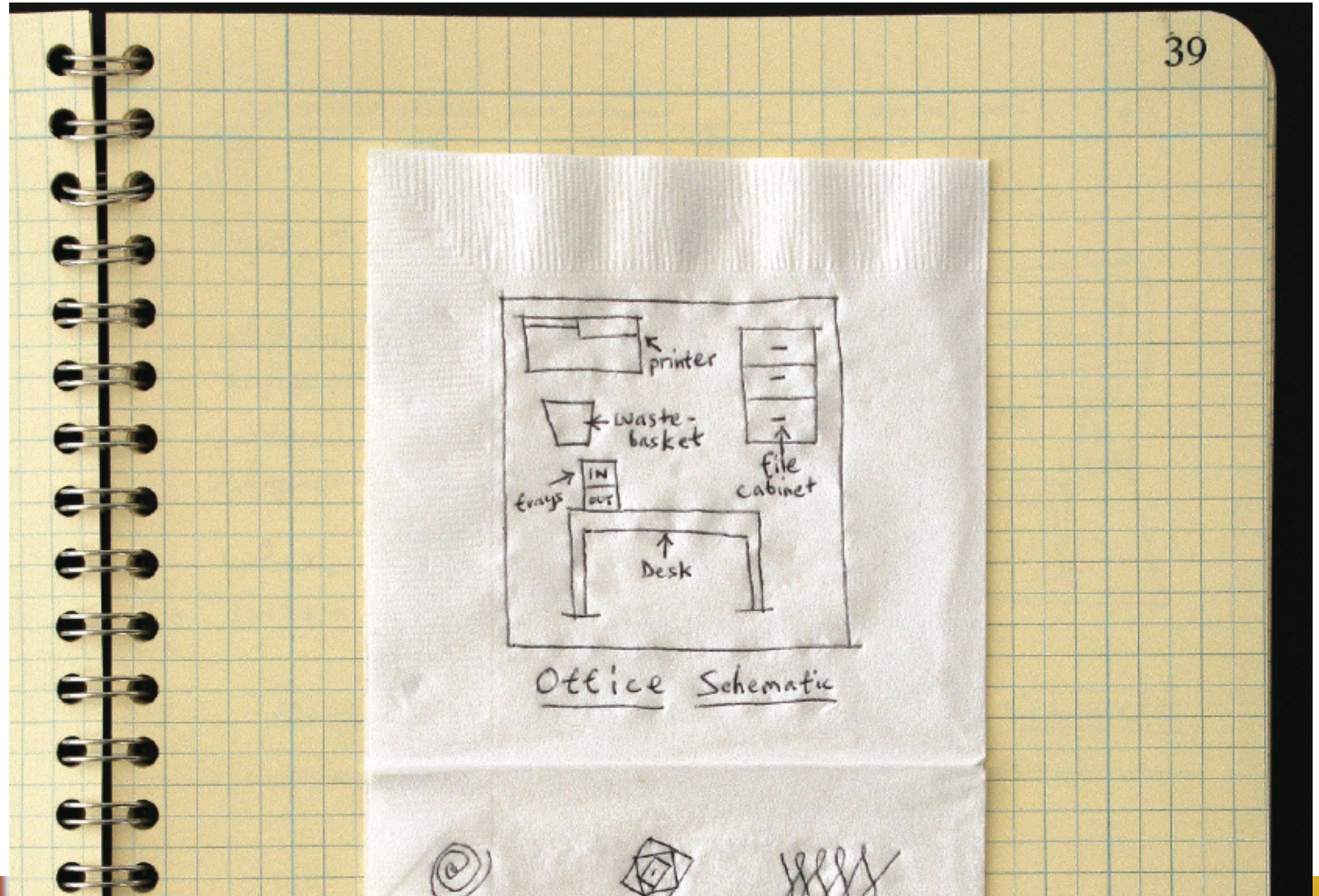
THE OFFICE SCHEMATIC…



THE DESKTOP METAPHOR…

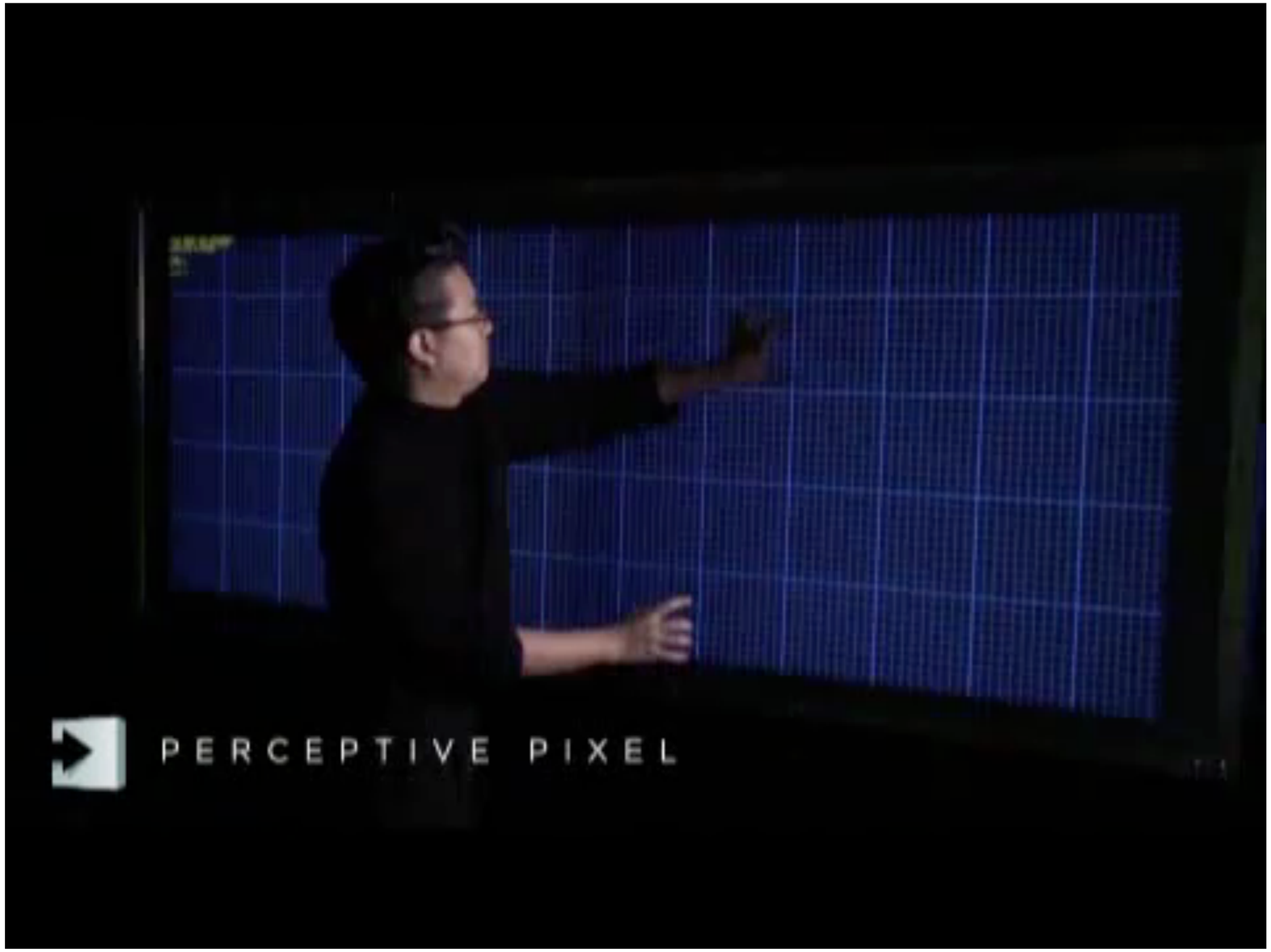
http://www.designinginteractions.com/interviews/TimMott

THE DESKTOP METAPHOR…



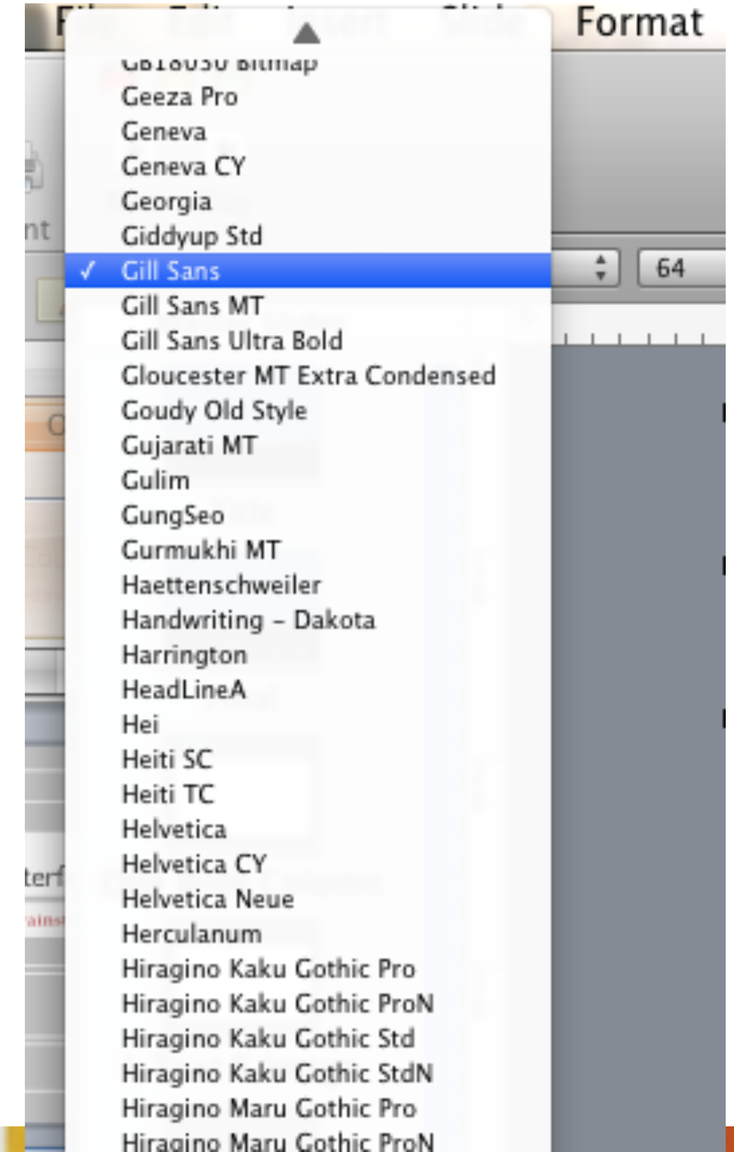
IS THIS A GOOD IDEA? WHEN?

HOW ABOUT THIS?

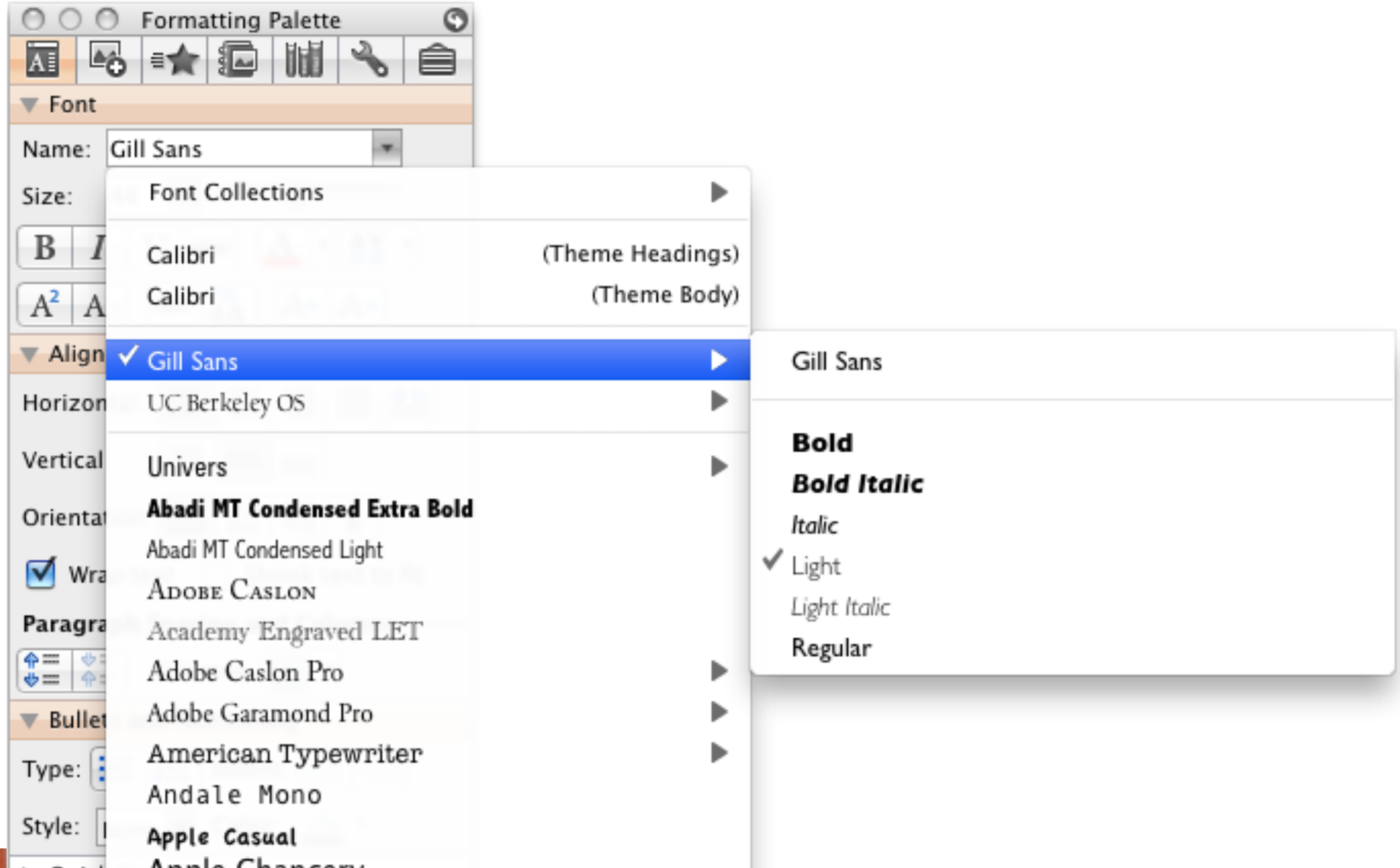


Jeff Han,
Perceptive Pixel

FONT SELECTION IN KEYNOTE



FONT SELECTION IN POWERPOINT



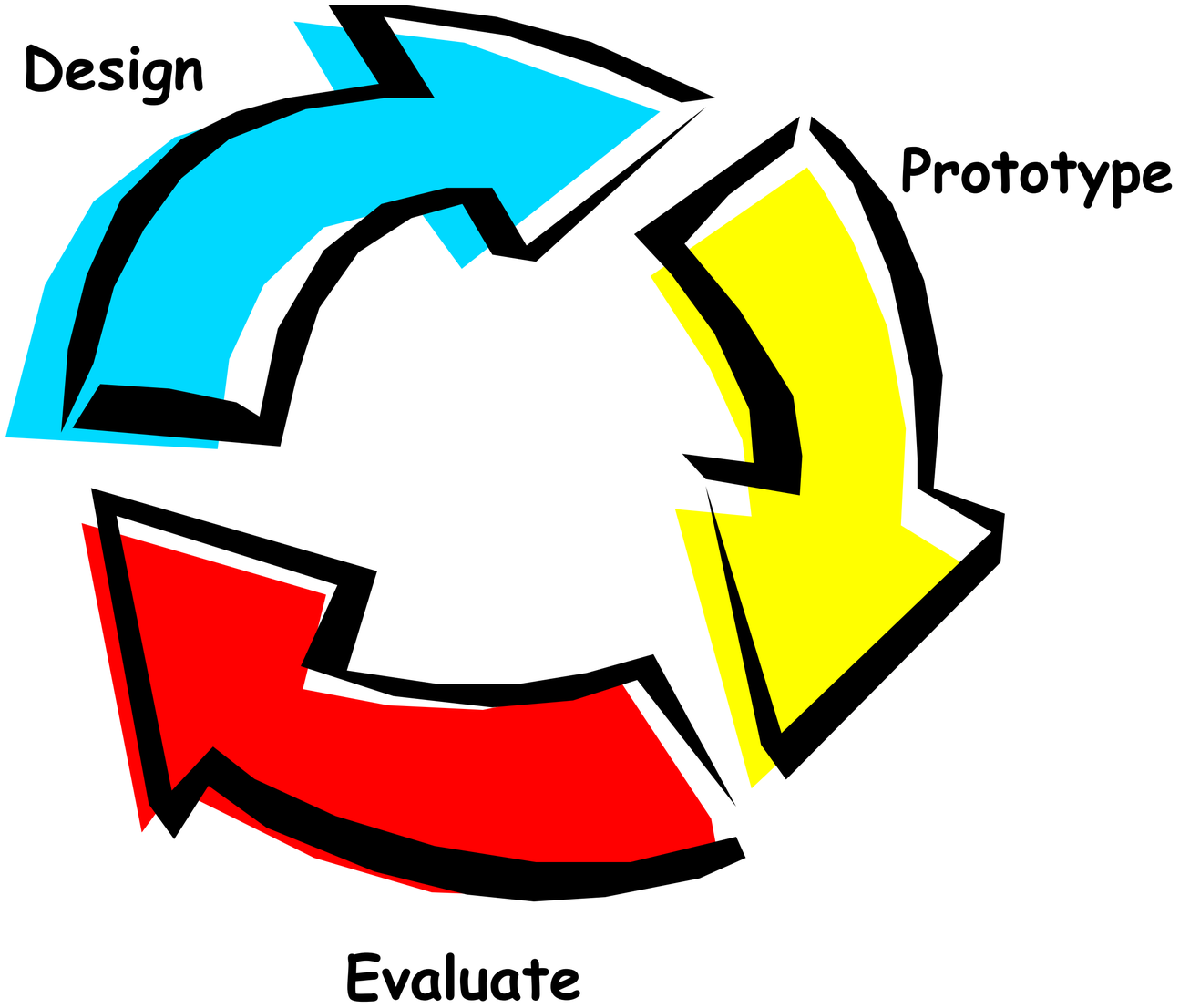
TOPICS FOR TODAY

The Design Cycle

Brainstorming

Critique

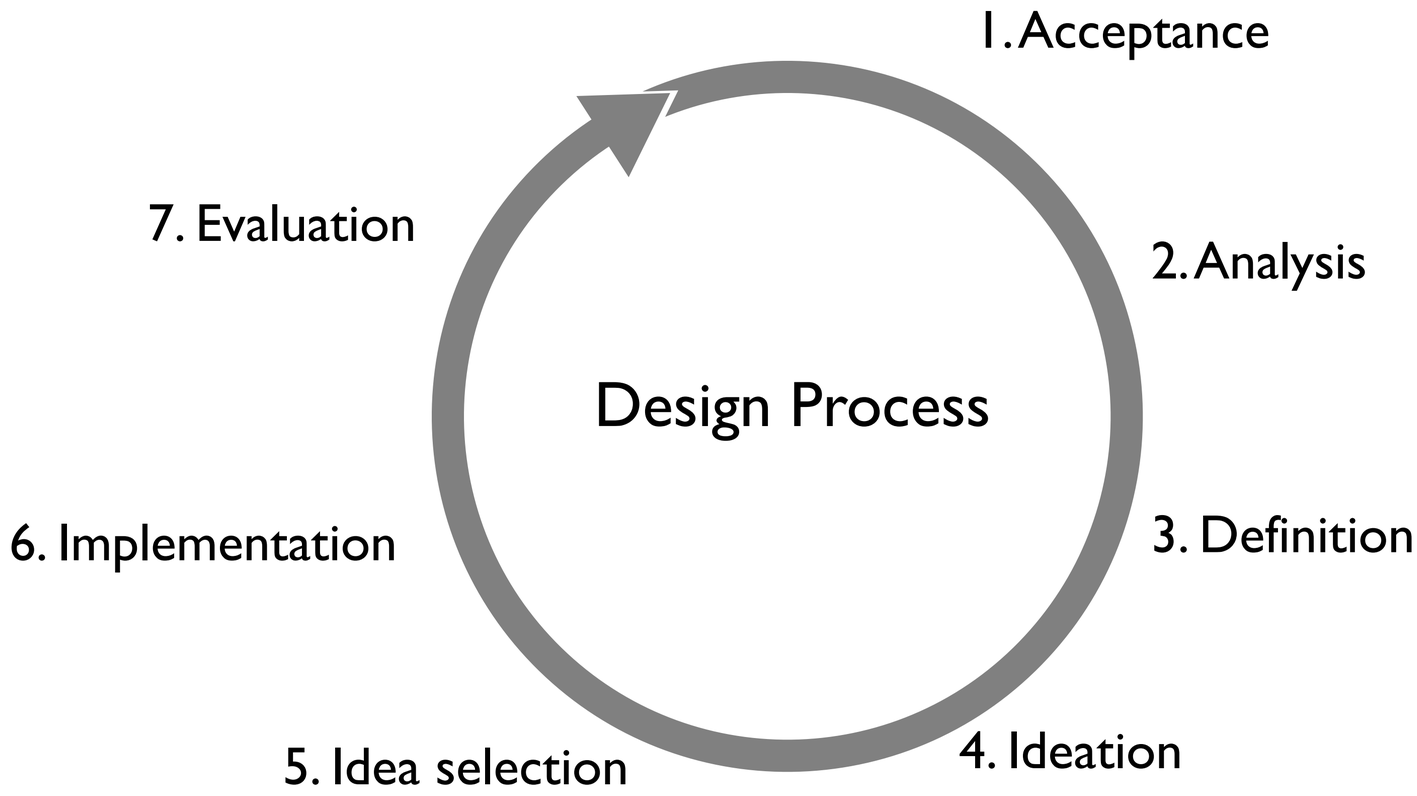
THE DESIGN CYCLE


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]



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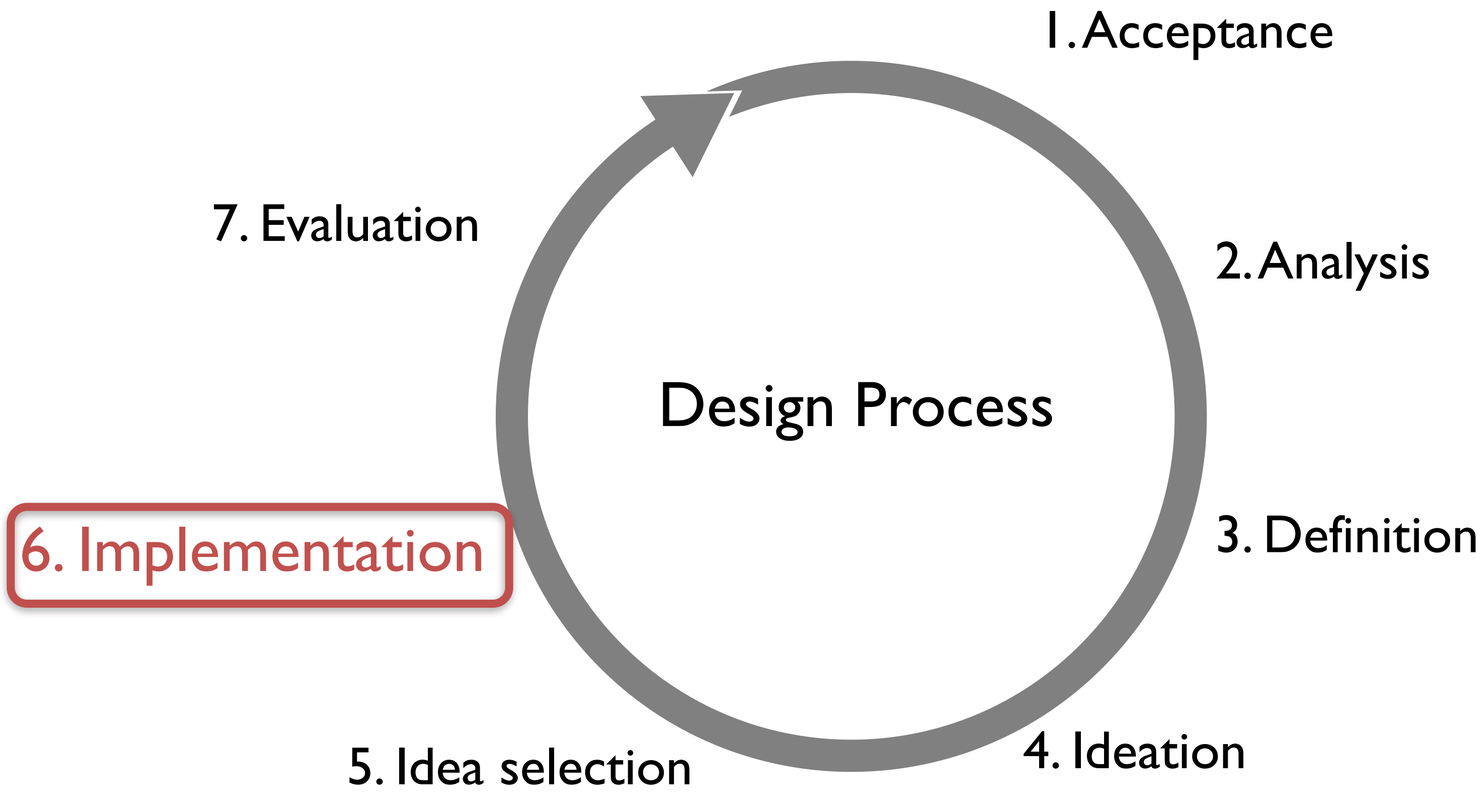


ACCEPTANCE

Getting started

Because of a deadline

Because of possible reward

Because you are forced to

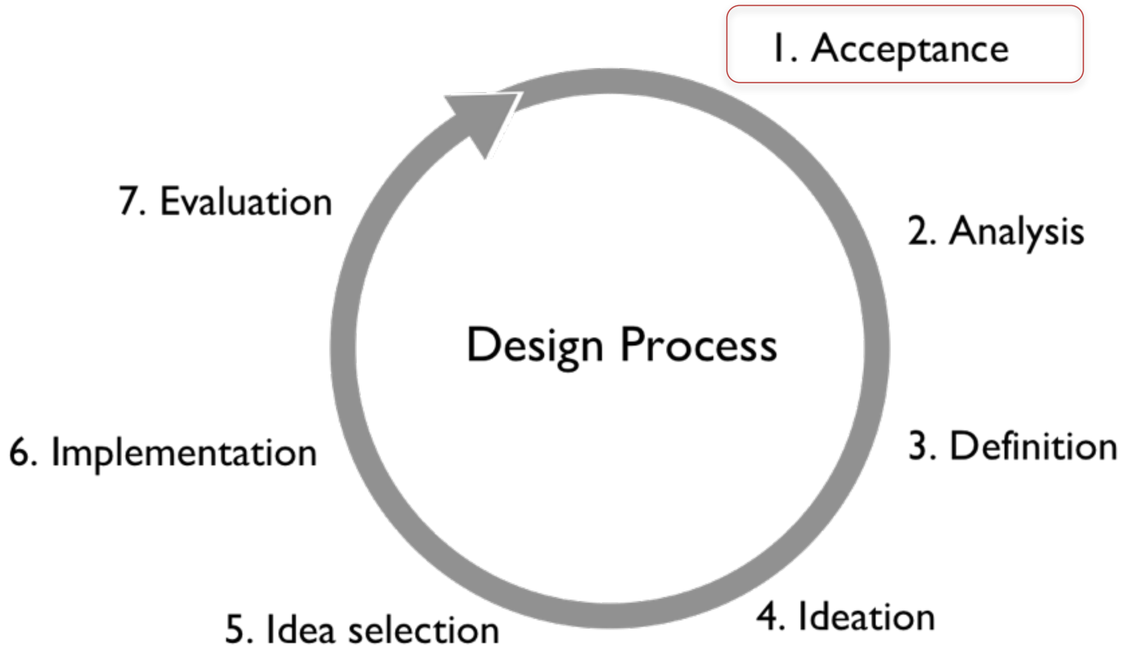
Commitment

Time

Resources

Responsibility

Key is to set motivation



ANALYSIS

Understand Users and Tasks

Who are the users?

What are their tasks?

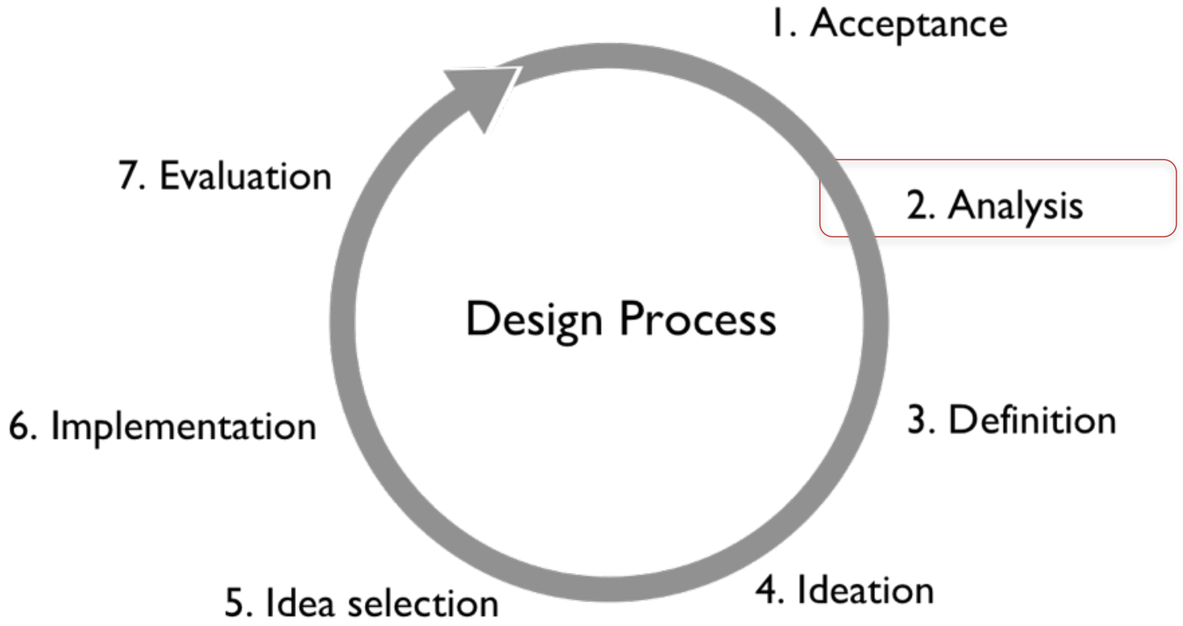
Observe and test, don’t guess

Tools

Notebook

Smartphone:

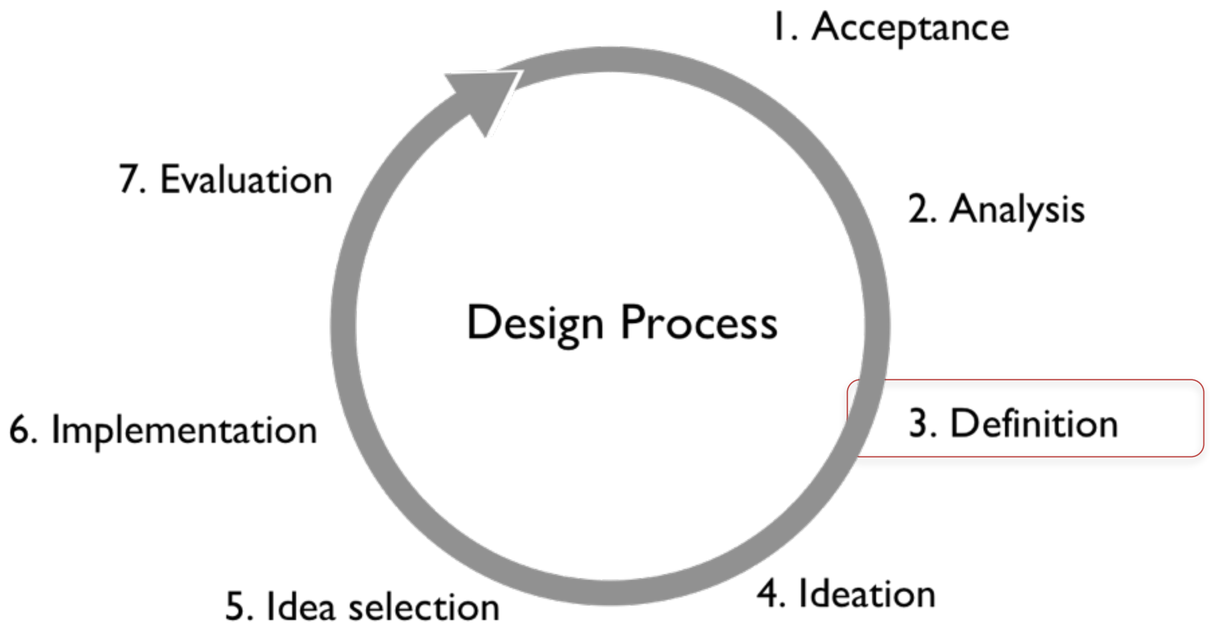
- audio + video recorder
- still camera



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

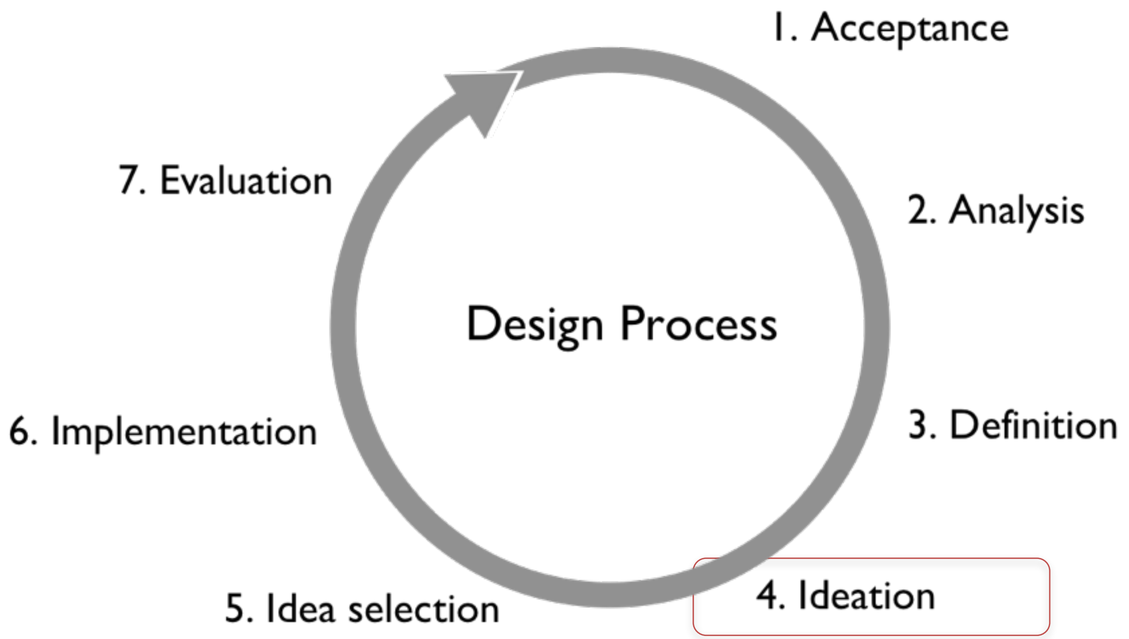
Loosen up with simple games
Do homework
Seed with related ideas/objects

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

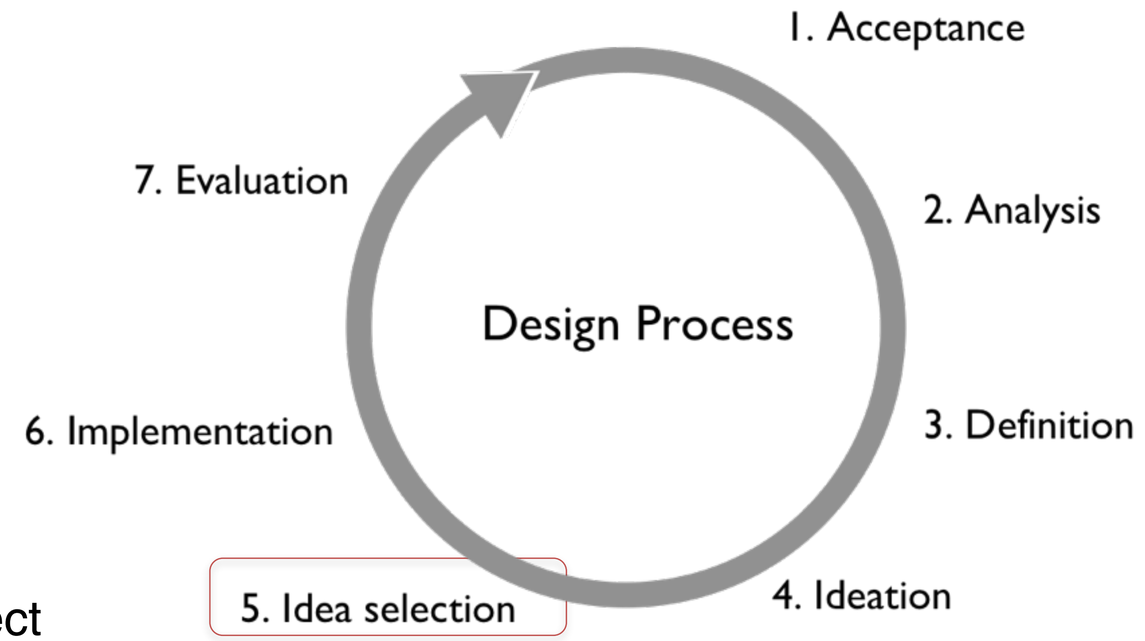
Define importance of each idea

Does it address 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)

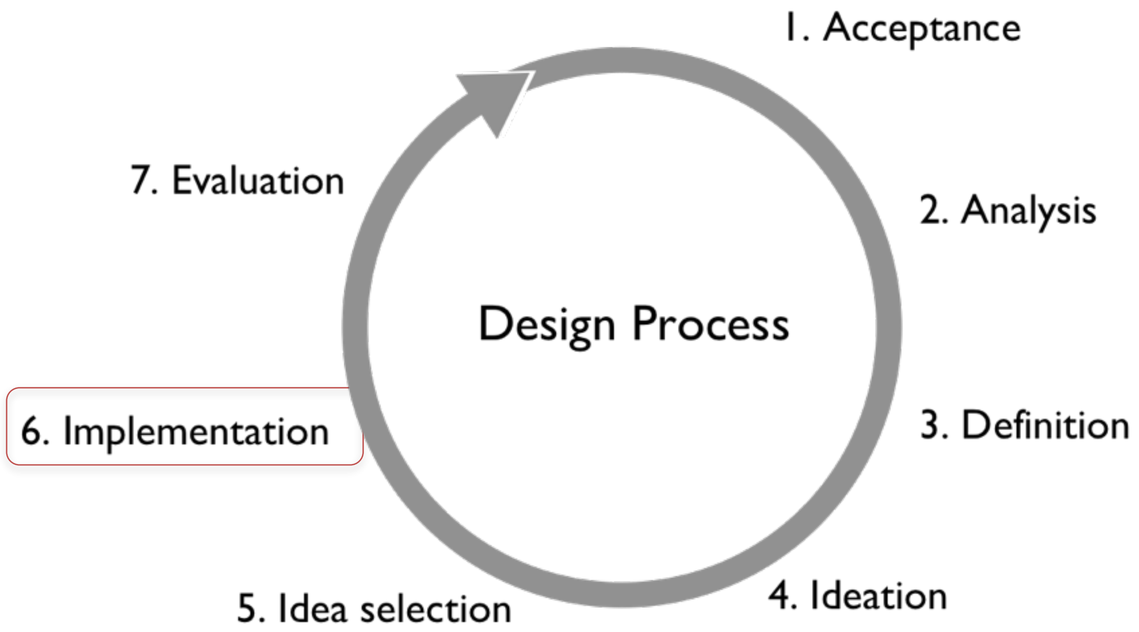
sketches, paper models, foam core, …

Medium fidelity
(slower, more expensive)

JavaScript, Framer, Figma, Pixate

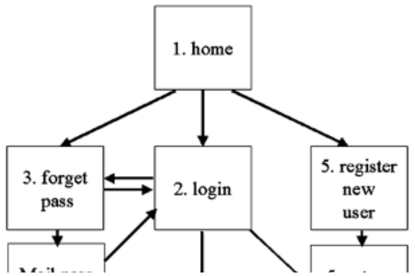
High fidelity
(slowest, most expensive)

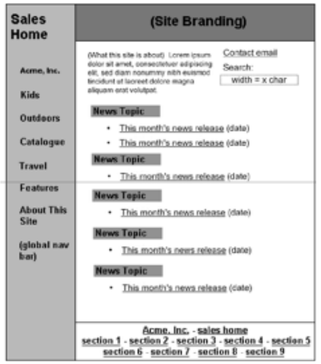
The full interface

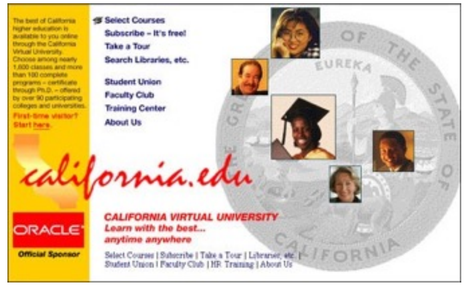


IMPLEMENTATION EXAMPLE: WEB DESIGN

Site Maps → Storyboards → Schematics → Mock-ups







EVALUATION

Many types of evaluation:

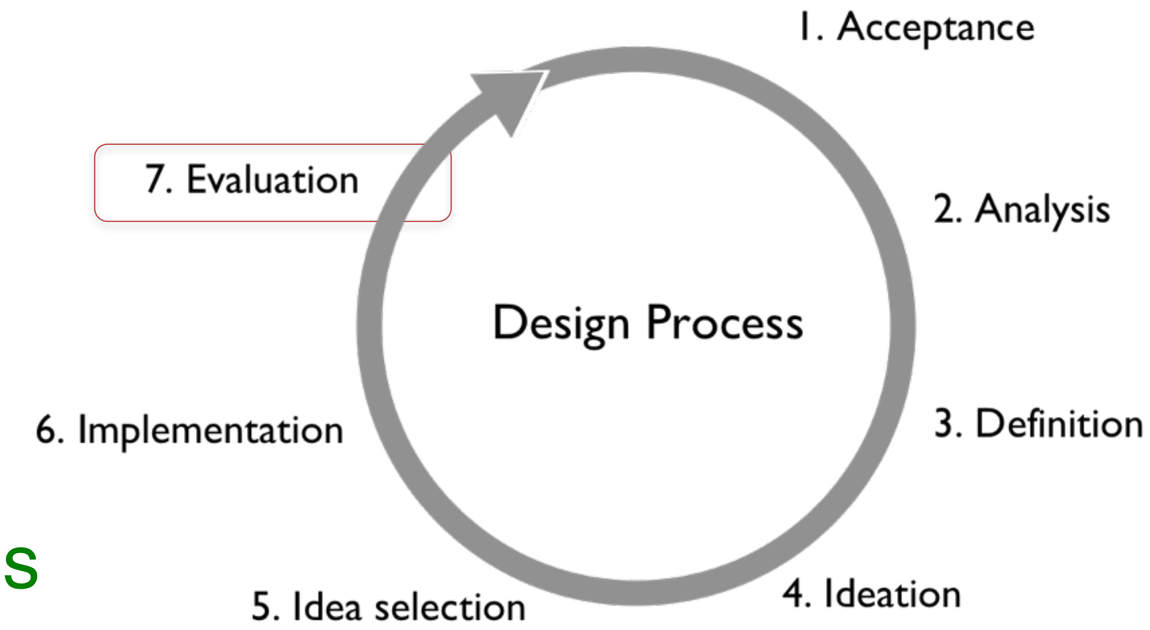
Prototype walkthroughs

Think-aloud studies

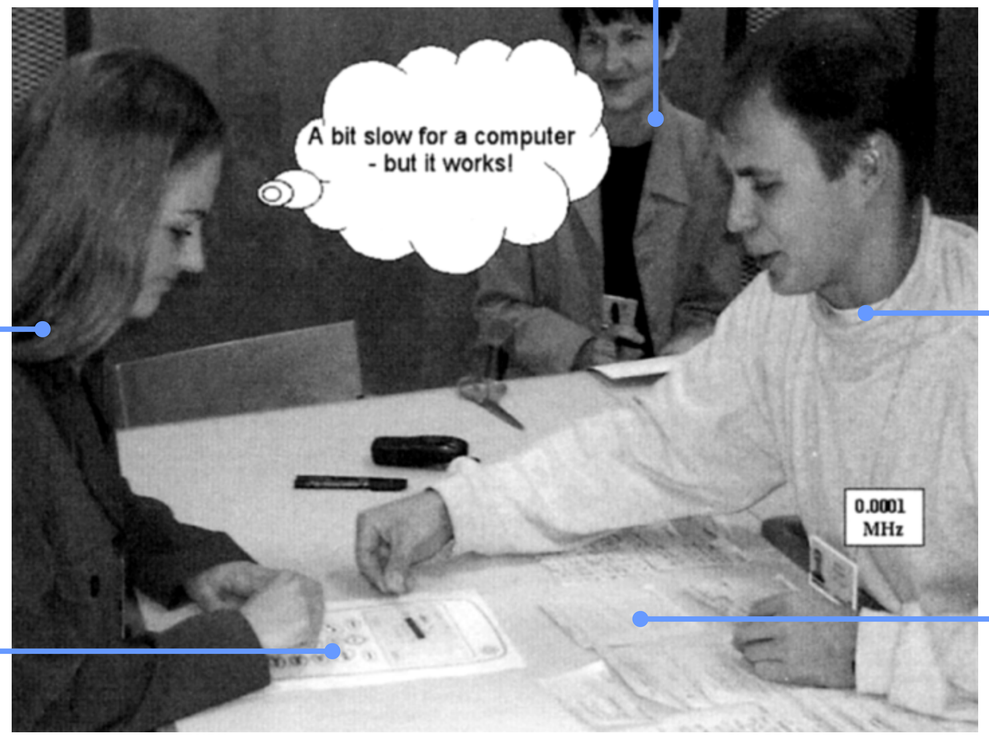
Wizard-of-Oz

Performance comparisons

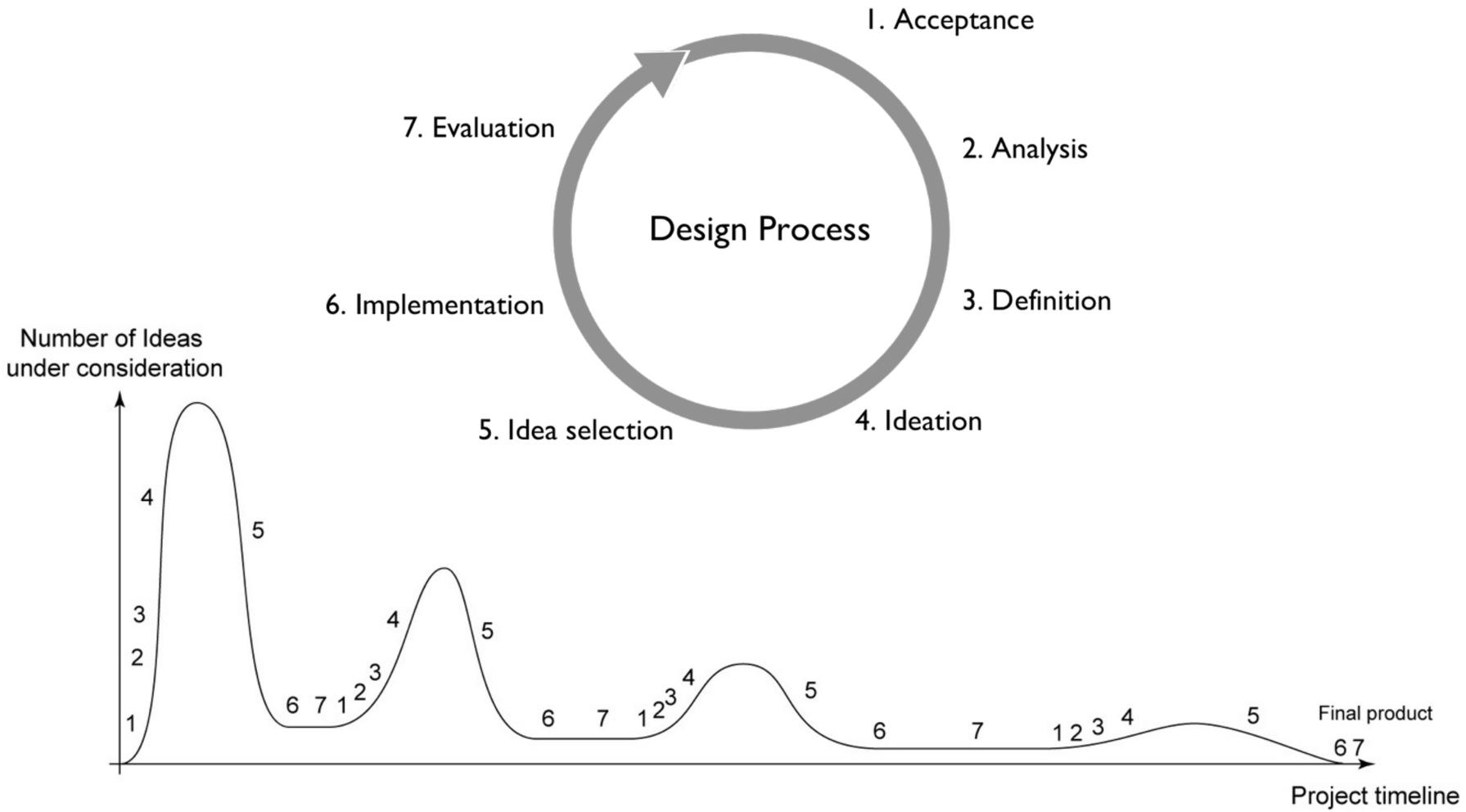
Type of evaluation chosen depends on the level of implementation, etc.



EVALUATION EXAMPLE: PAPER PROTOTYPE WALKTHROUGH



DESIGN CYCLE OVER PROJECT LIFESPAN



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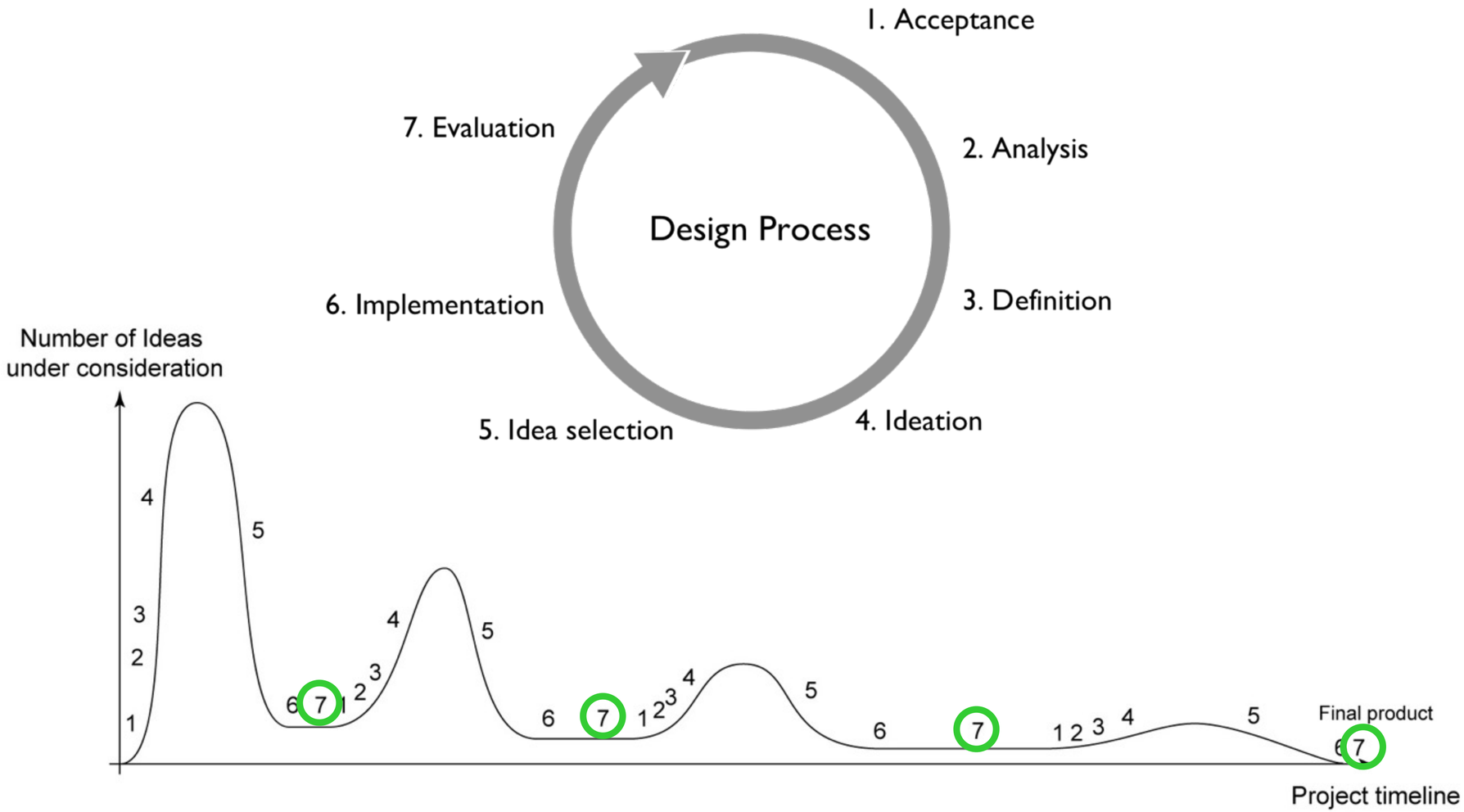
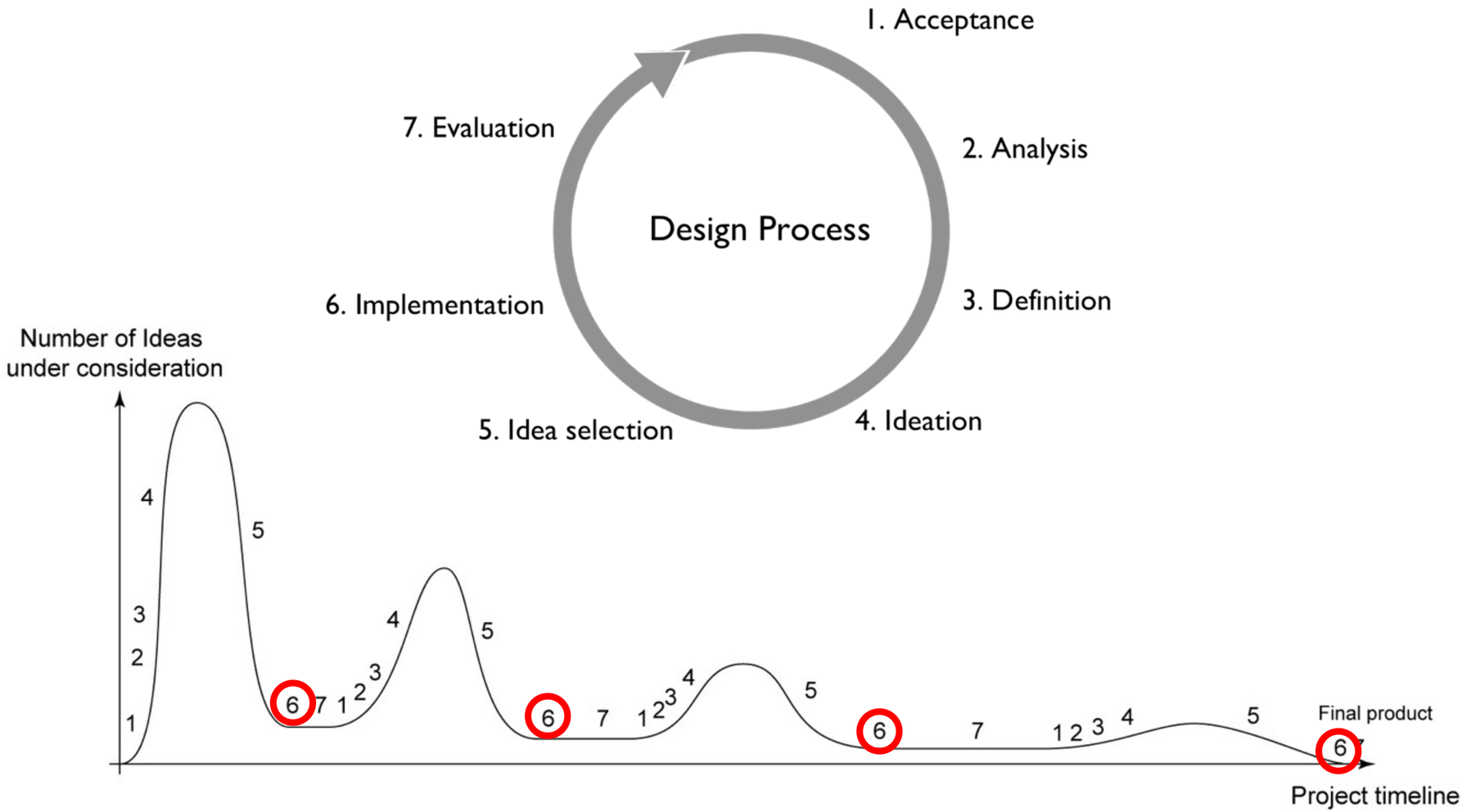
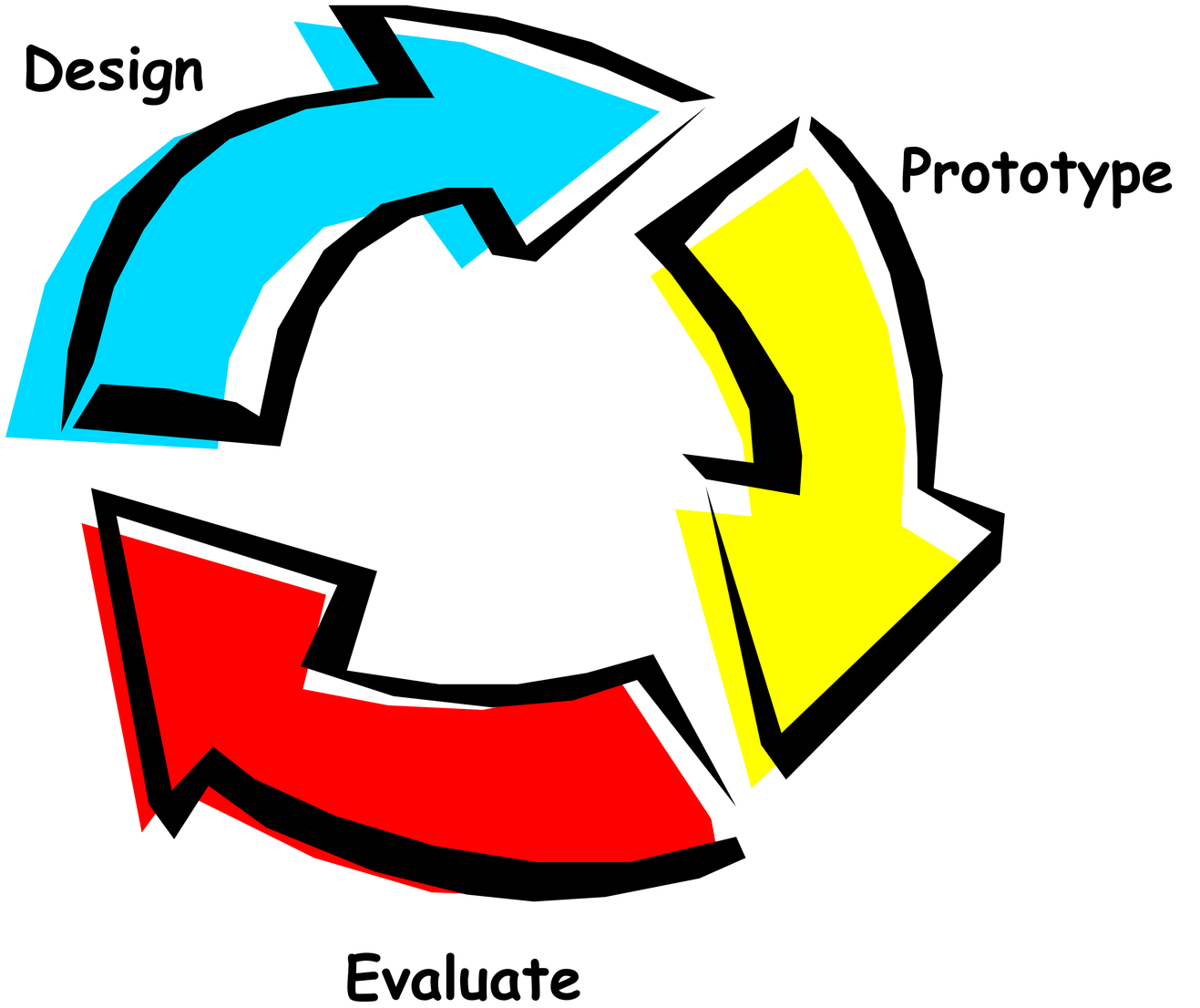


Evaluation reveals problems with design. Re-design requires cycling the process.

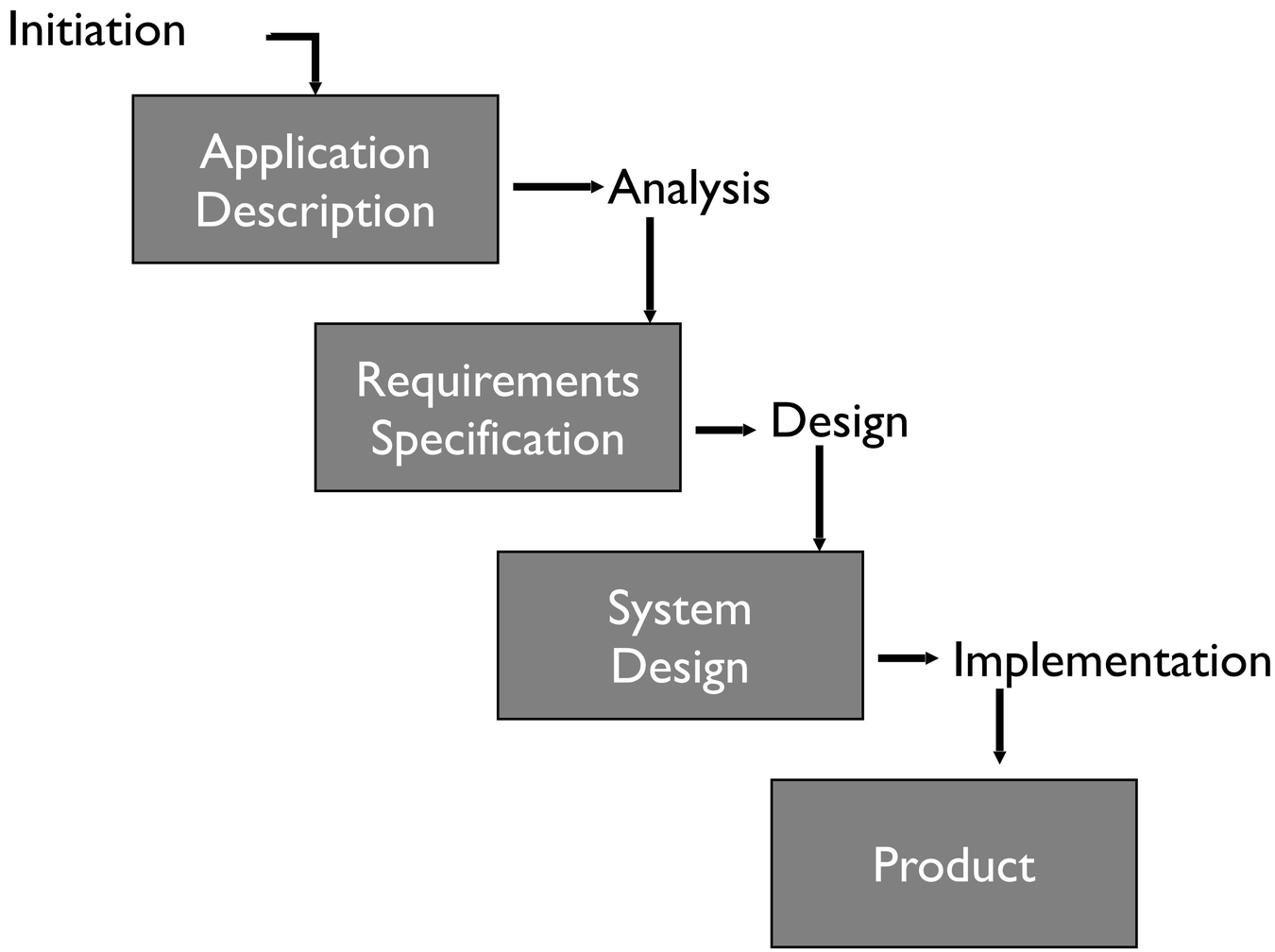
DESIGN CYCLE OVER PROJECT LIFESPAN



Prototype implementations eventually increase in fidelity to reach final product


Design
Prototype
Evaluate

WATERFALL MODEL (SOFT. ENG.)



COMPARISON

Focus differs

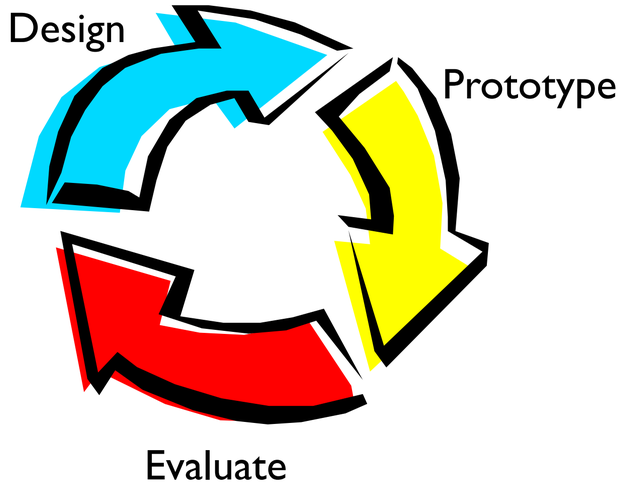
WF has no feedback

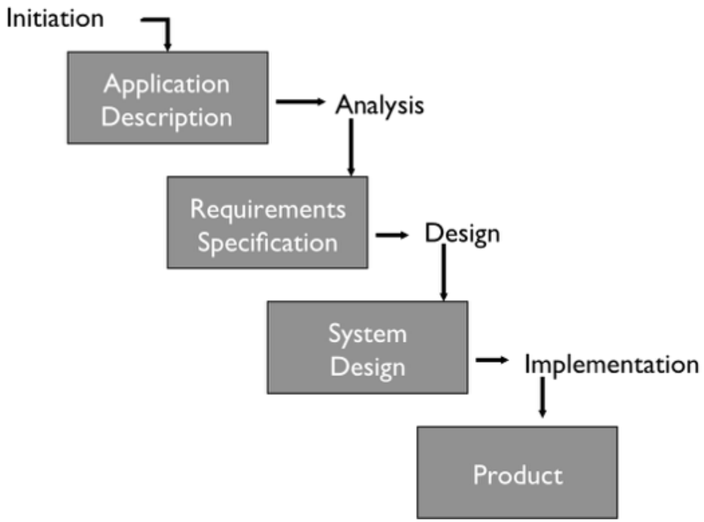
High cost of fixing errors:

increases by 10x at each stage

Iterative design finds problems earlier

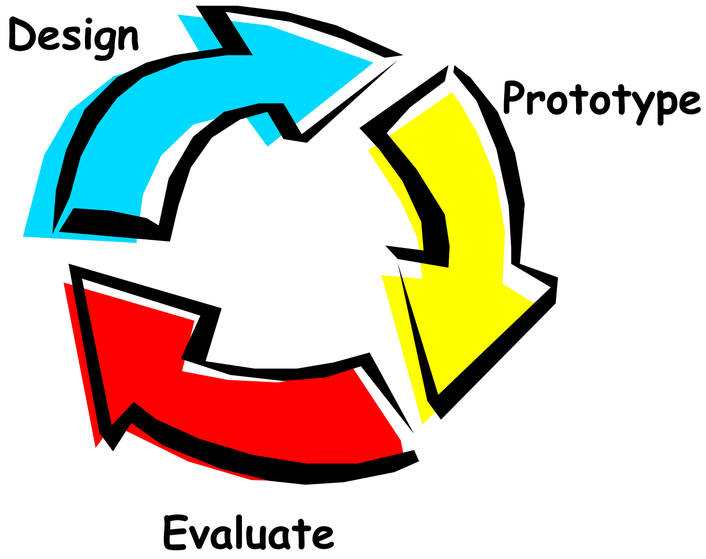
True for modern web applications?





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

SPRING 2016

BRAINSTORMING

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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…

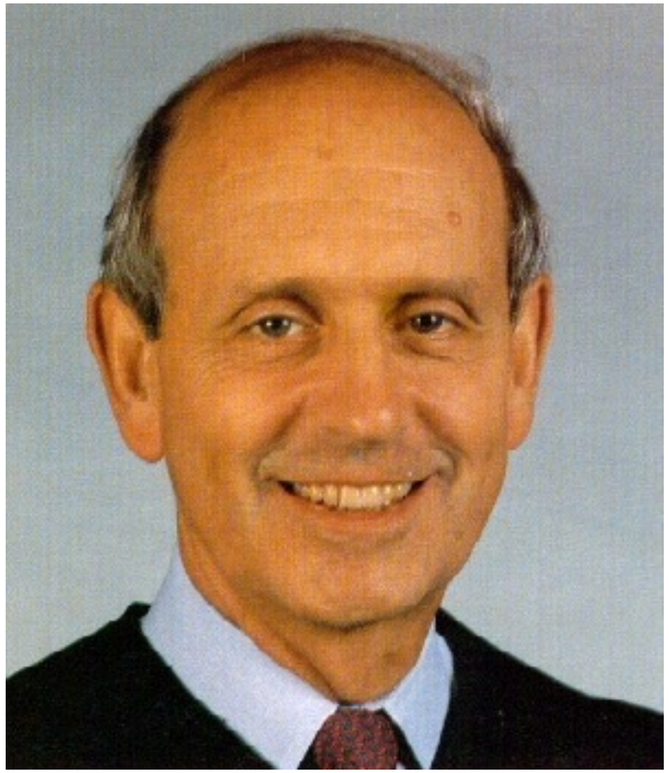
People in minority will adopt majority opinion and even manufacture their own explanation of it.

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



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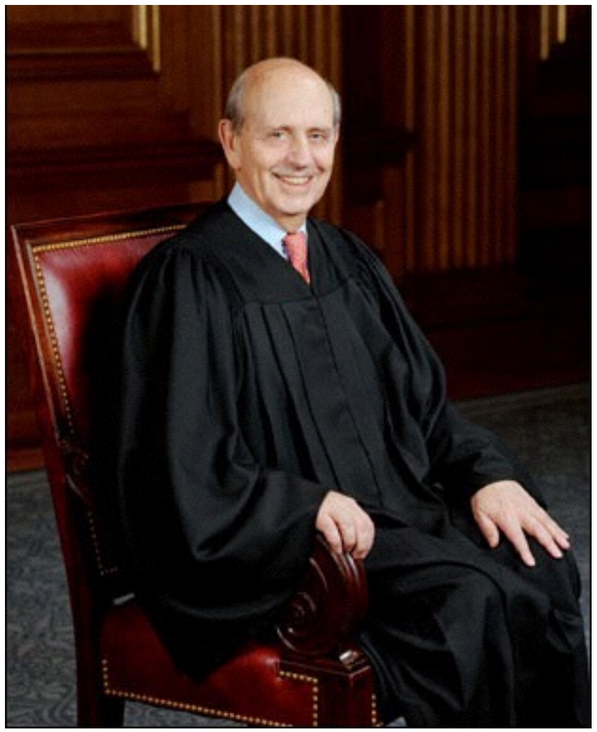


DISSENT AND AUTHENTICITY

The benefits of dissent are weakened if

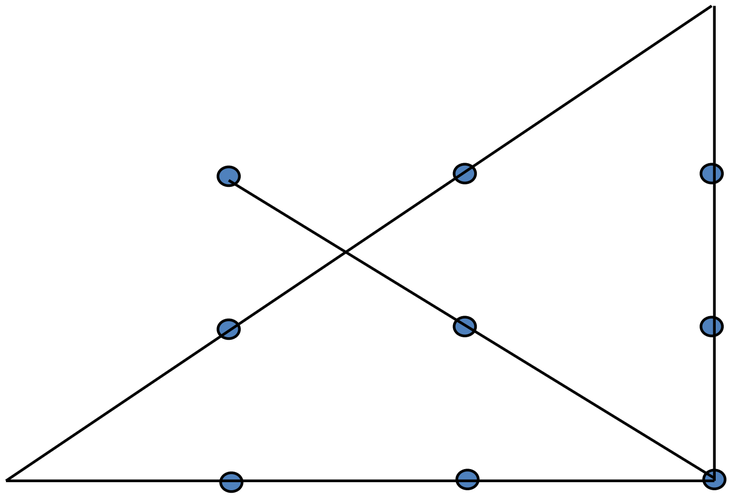
Dissent is not real: A deliberate “devil’s advocate” in the group can actually stifle dissent, because the majority know the opinion is manufactured.

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:

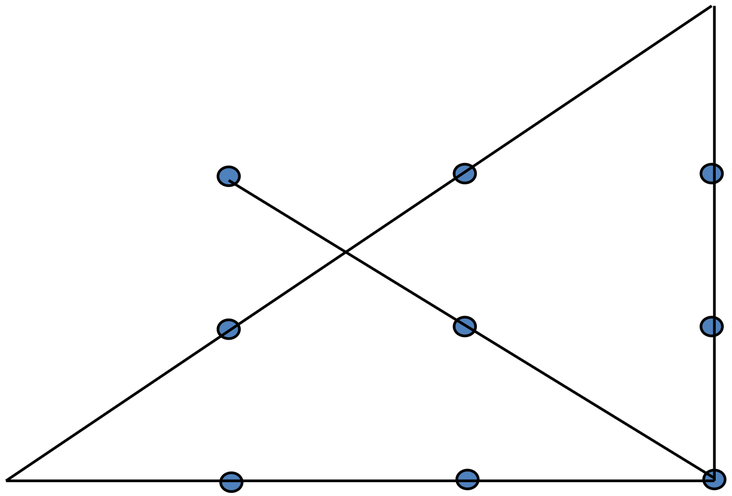


WHY IS THIS HARD?

We adopt expectations about the solution

Based on conventions

Based on what we believe the questioner expects



IDEO’S BRAINSTORMING RULES

1. Sharpen the Focus
2. Playful Rules
3. Number your Ideas
4. Build and Jump
5. The Space Remembers
6. Stretch Your Mental Muscles
7. Get Physical

Aim for quantity

Hope for quality

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

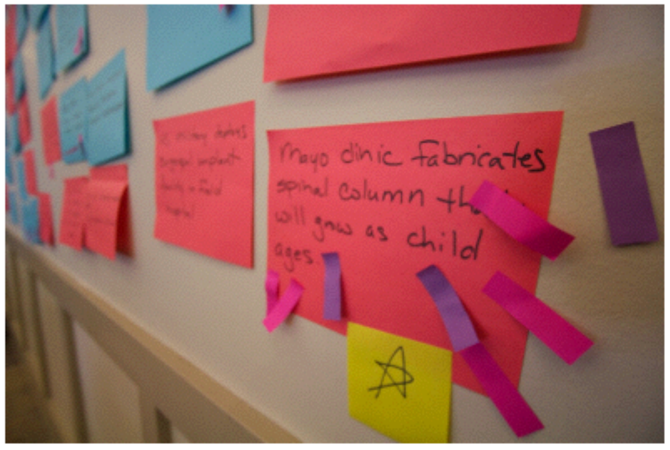
This requires a strong instinct to be able to distinguish fatal vs. minor flaws in an idea

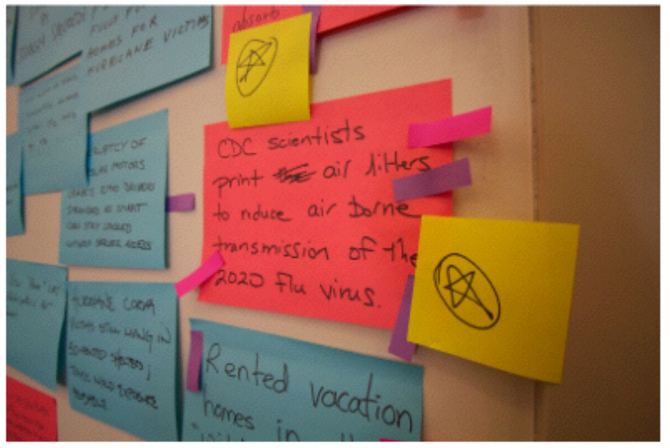
THE SPACE REMEMBERS

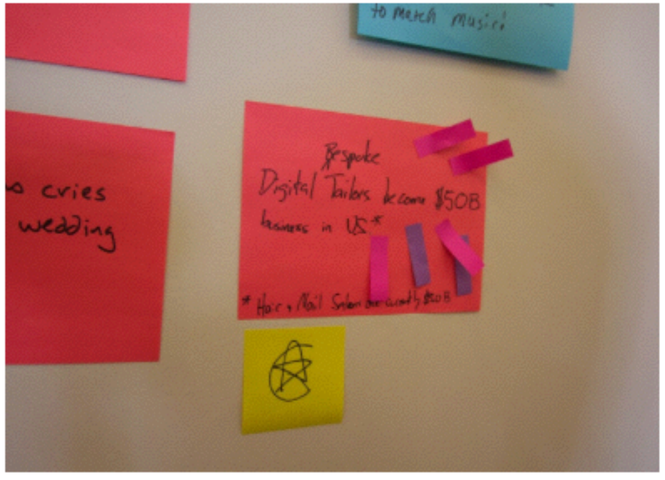
Covering whiteboards or papering walls with text is extremely useful in group work.

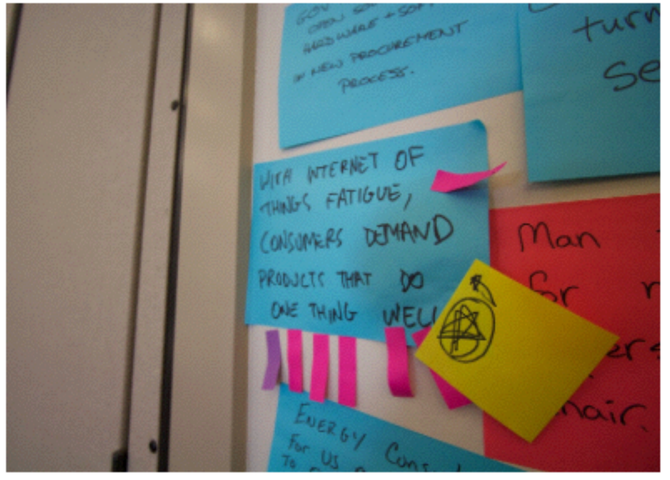
It’s a very effective form of external (RAM) memory for group

Even better, its shared RAM. Helps group share understanding


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


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


to match music!
Bespoke
Digital Tailors
cries
wedding


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


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

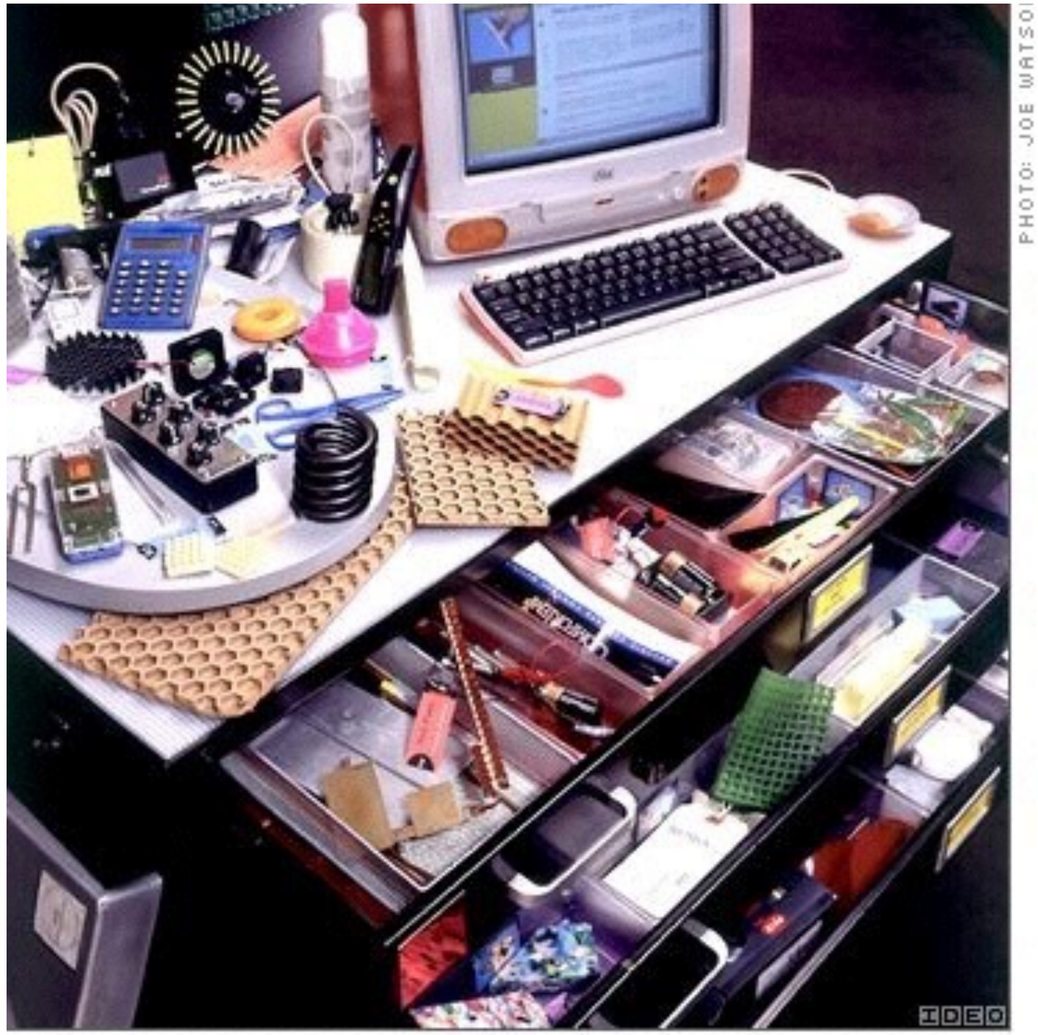

GENETIC ALGORITHM
COMPETITION

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

Moggridge, Designing Interactions, p.732


abc