

CS160

USER INTERFACE DESIGN

FALL 2015



THE DESIGN CYCLE

3 SEPT 2015

ERIC PAULOS

www.paulos.net

UNIVERSITY OF CALIFORNIA



Berkeley

ANNOUNCEMENTS

Due Next Thur– Reading Response

Due 10 Sept (before class) – DESIGN 01

Due 11 Sept (Fri) – PROG 01

Enrollment

Late reading responses

Attendance

Screen Record PROG 01

What Section will you Attend?

SECTIONS MOVING FORWARD

101	2-3pm	405 Soda	
102	3-4pm	405 Soda	
103	4-5pm	405 Soda	CANCEL
104	5-6pm	405 Soda	CANCEL
105	10-11am	B1 Hearst Annex	
106	11-12	243 Dwinelle	
107	1-2pm	174 Barrows	
108	2-3pm	85 Evans	CANCEL

~~CLASS~~ STUDIO ATTENDANCE

Our "class" is a 3 hour Studio with a lunch break

Missing any part of the Studio is equivalent to missing class (AM+PM=Studio)

The required 8 classes are:

~~26 Aug~~

~~27 Aug~~ Section

24 Sept

22 Oct

29 Oct

05 Nov

12 Nov

19 Nov

and 10 Dec the Final Critique of course....

piazza
Ask. Answer. Explore. Whenever.

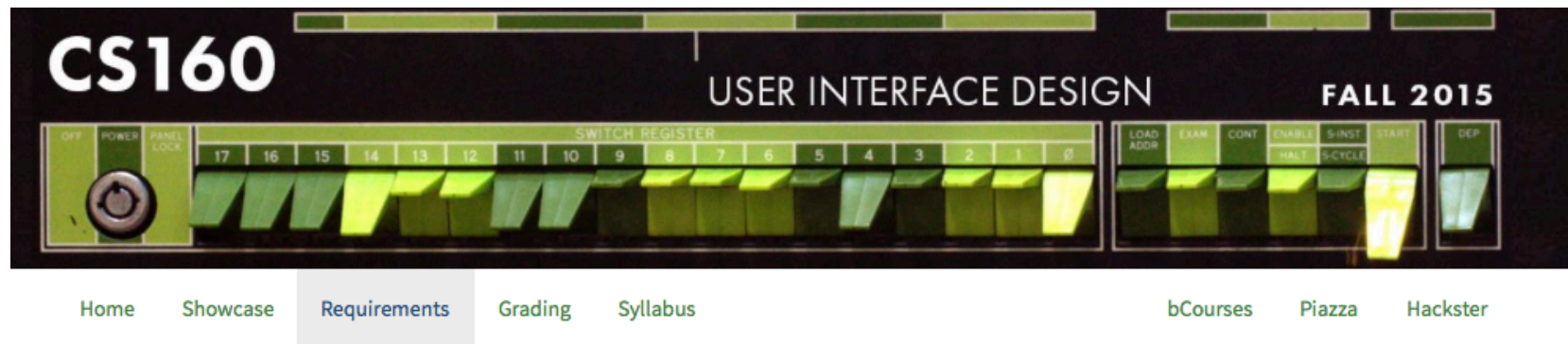
RR GRADING GUIDELINES

Convince us that you have carefully thought about the assigned reading

Scale:

- Exceptional (3)
- Adequate (2)
- Lacking (1)
- No answer (0)

CLASS WEBSITE: HCI.BERKELEY.EDU/CS160



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.

CS160

Lectures:	Thu 10:30AM - 12:00PM and 1:00PM - 2:30PM 310 Jacobs Hall
Instructor:	Professor Eric Paulos
Contacting GSIs:	via Piazza
Midterm Exam:	TBA
Final Presentations:	TBA

Course Staff

[🕒 Office Hour](#)

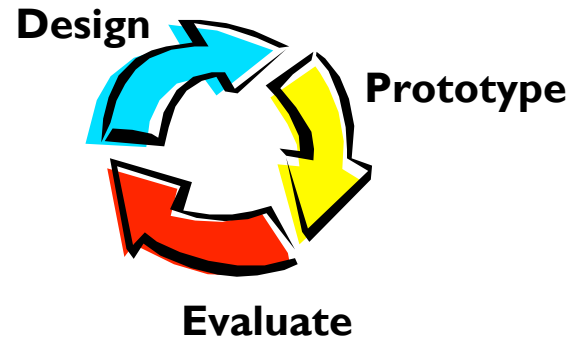
[📍 Location](#)

REVIEW

Course overview

Project theme

Course mechanics



CS160 USER INTERFACE DESIGN **FALL 2015**

Home Showcase Requirements Grading Syllabus bCourses Piazza Hackster

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DUE THURSDAY: NEXT READING RESPONSE

Due Thursday,
before class

Respond to reading

Will be graded

RR 02

 Publish

 Edit

READING REQUIRING A RESPONSE:

Read: The Design of Everyday Things. by Norman. Read Chapter 1, "THE PSYCHOPATHOLOGY OF EVERYDAY THINGS"

[The-Design-of-Everyday-Things-Chap01.pdf](#)  

Prompt:

Look carefully at your current mobile phone. Point out and briefly discuss three designs elements you can identify that are affordances.

OTHER REQUIRED READINGS:

Read: Rogers, Y., Sharp, H., & Preece, J. (2011). Interaction Design: Beyond Human-Computer Interaction (3rd ed. ed.), pp 44-54 (Interface Metaphors) and pp 86-96 (Cognitive Frameworks)

[Interaction Design Interaction Frameworks NEW.pdf](#)  

[Interaction Design Cognitive Frameworks.pdf](#)  

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)

HACKSTER.IO

hackster.io

Projects ▾

Platforms

Challenges

⋮ ▾

🔍 Search



User Interface Design

By Eric Paulos, Fall 2015, UC Berkeley

CS160 Course at UC Berkeley

📍 Berkeley, United States



Projects

Assignments

Students

Staff

Manage page ▾

All student projects will appear here.

HACKSTER.IO

hackster.io

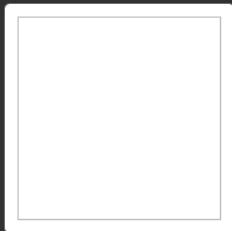
Projects ▾

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Assignment: Final Report

HONEY BADGERS PRESENT

Assassins

A SOCIAL GAME APP FOR ANDROID AND QUALCOMM TOQ

Final Report: Assassins

CORINNE SCHAPLE
by Team Honey Badgers
LESLEY CHIANG
RYAN WU

53 VIEWS 0 COMMENTS 0 RESPECTS

encounter

Encounter

by Team Cloud9

46 VIEWS 0 COMMENTS 0 RESPECTS

ToqTrainer

by Team TiqToqToe

74 VIEWS 0 COMMENTS 0 RESPECTS



HACKSTER

You will be invited to join Hackster (and our class)

You will make projects (assignments)

You will submit them to the Assignment (attach)

Keep working until the deadline

Locks at deadline


Staff can see and grade even if private

Please make public after grading

PROG 01: YOU ANIMAL: DUE 11 SEP

PROG 01: You Animal

 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

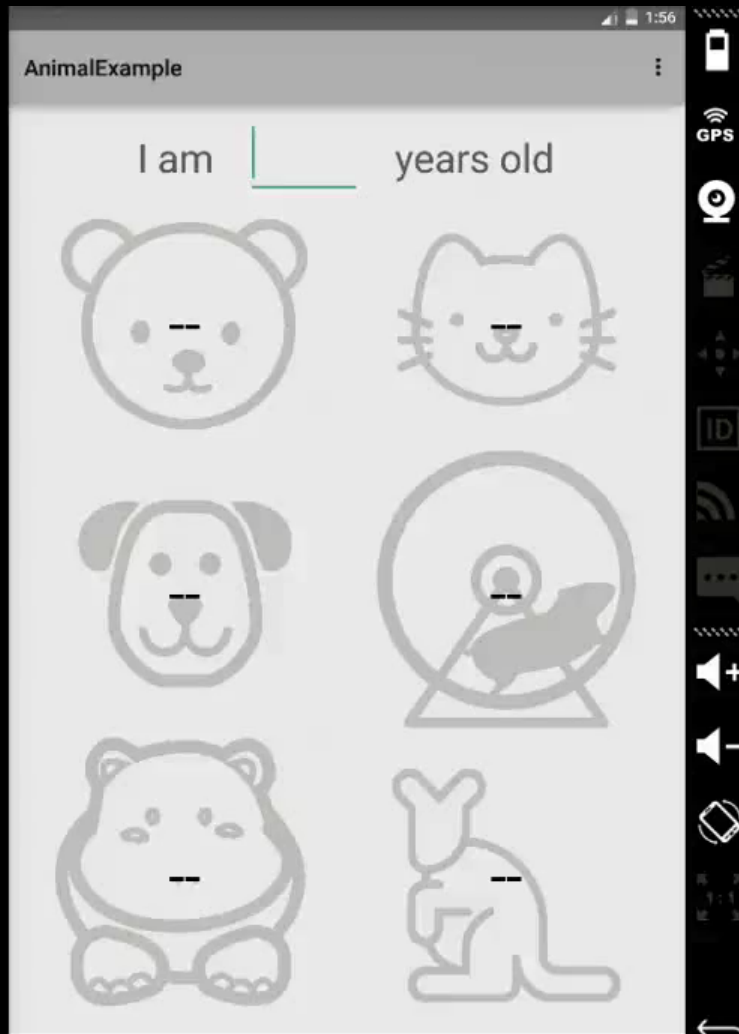
You will build an **animal years** app

You know how it goes. You're having coffee with your friends when suddenly the age old debate breaks out - "So how old are you in hippopotamus years?" Luckily, you have your trusty **You Animal** converter app that you built in CS160. You can enter your current age (in human years) and automatically be given your age if you were a dog, cat, kangaroo, or even hippopotamus.

You will submit your source code, the executable, **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



HELP WITH PROGRAMMING ASSIGNMENT

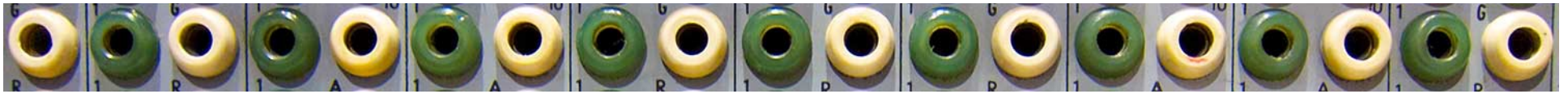
Office Hours

Sections

Recommended:

Follow the official Android tutorials

Building Your First App



LOOKING AT INTERACTION DESIGNS

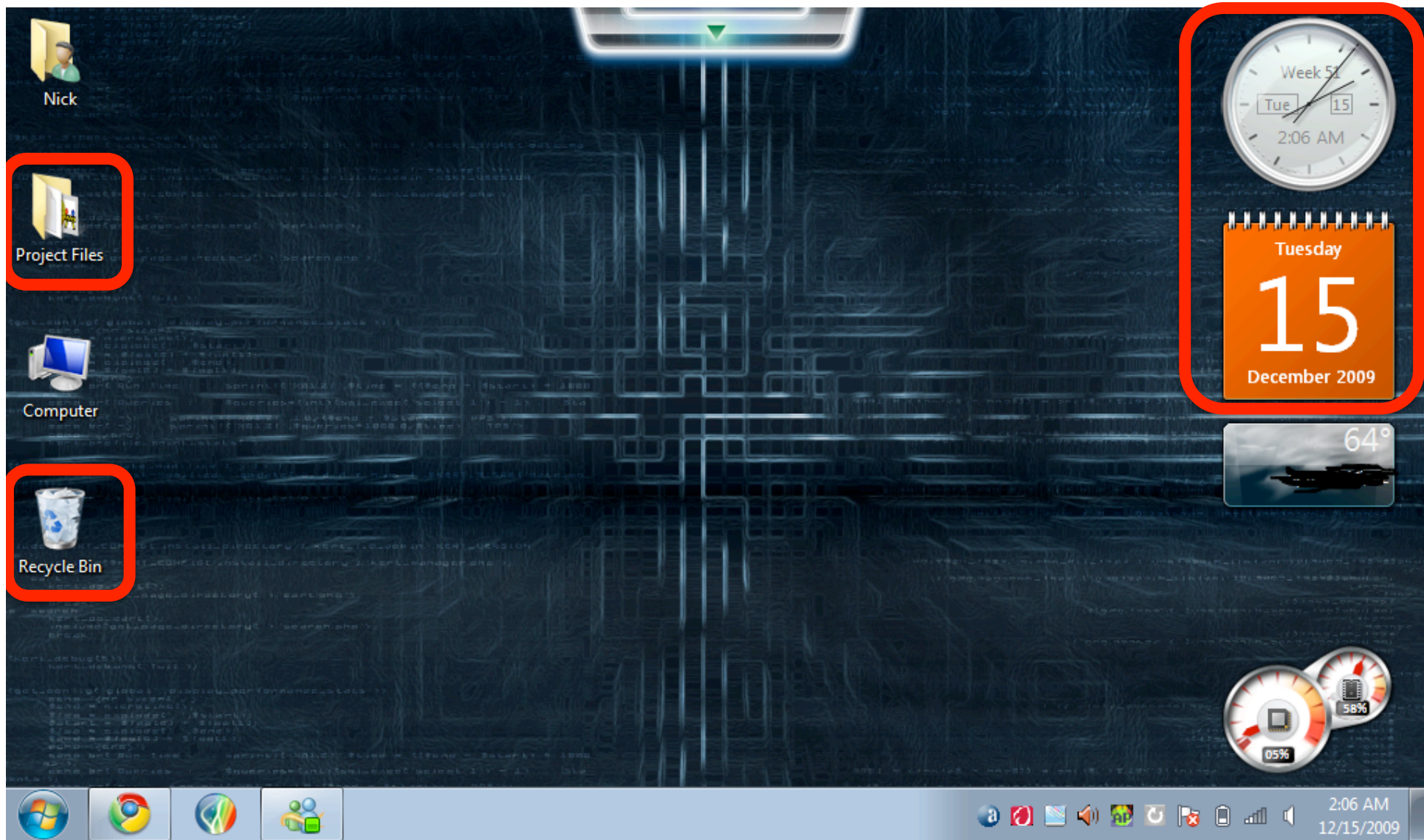
Password



Generated random password is: 'oOmunHz&wCql#FL#|tiTh#GQ:sc/mI:'

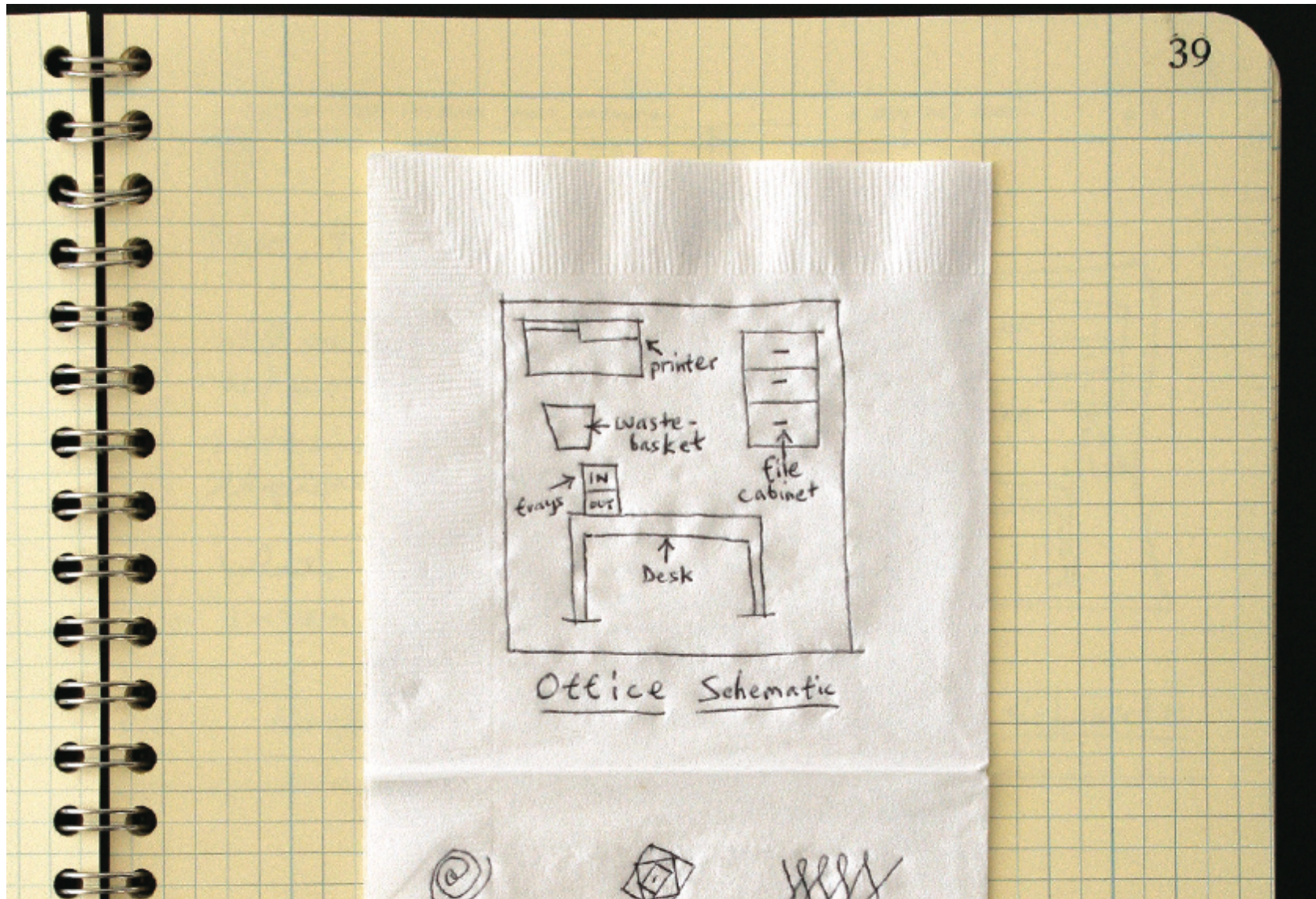
Make sure you write this down because it will be needed for future upgrades.

OK



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

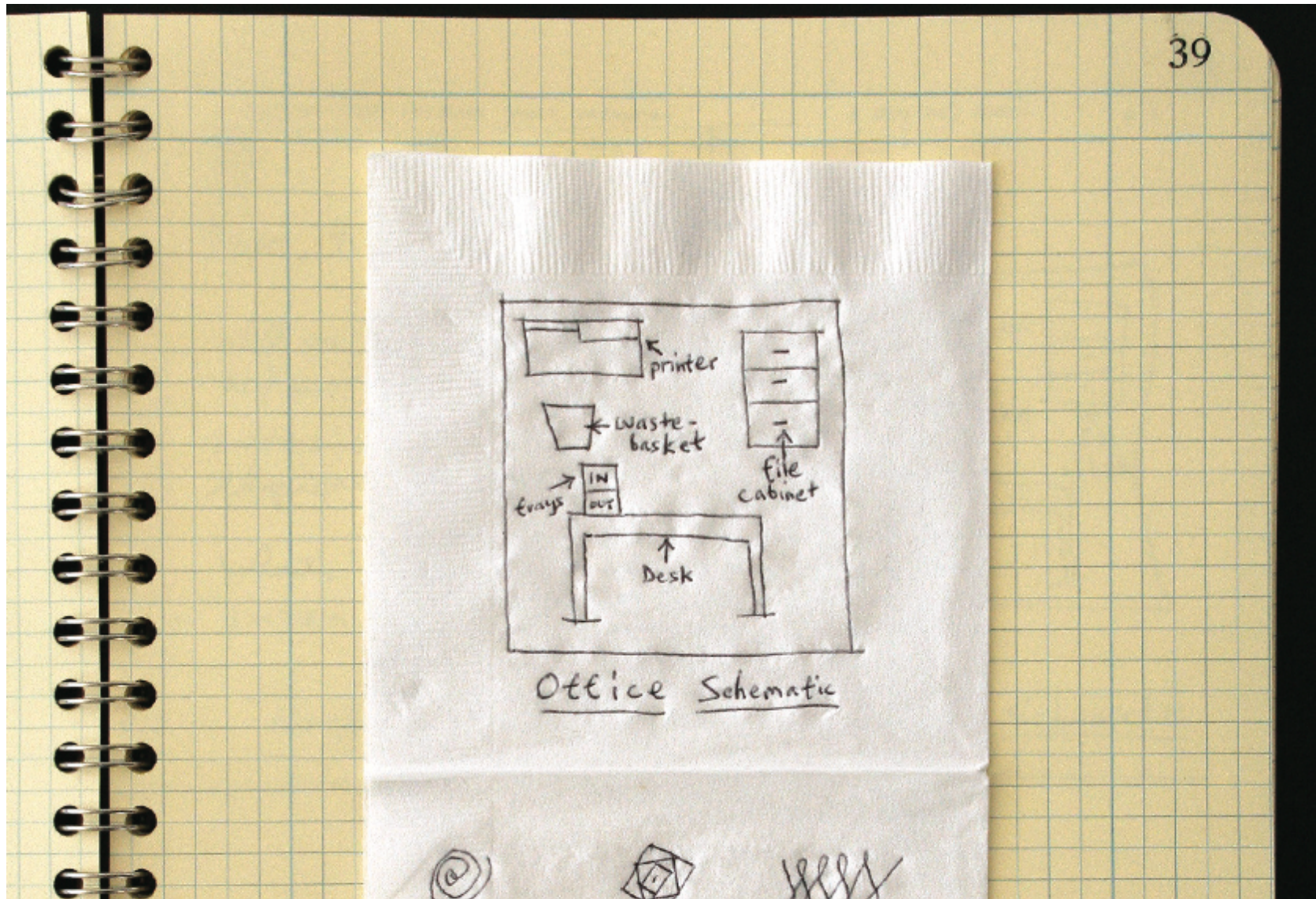
THE OFFICE SCHEMATIC...



THE DESKTOP METAPHOR...

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

THE DESKTOP METAPHOR...

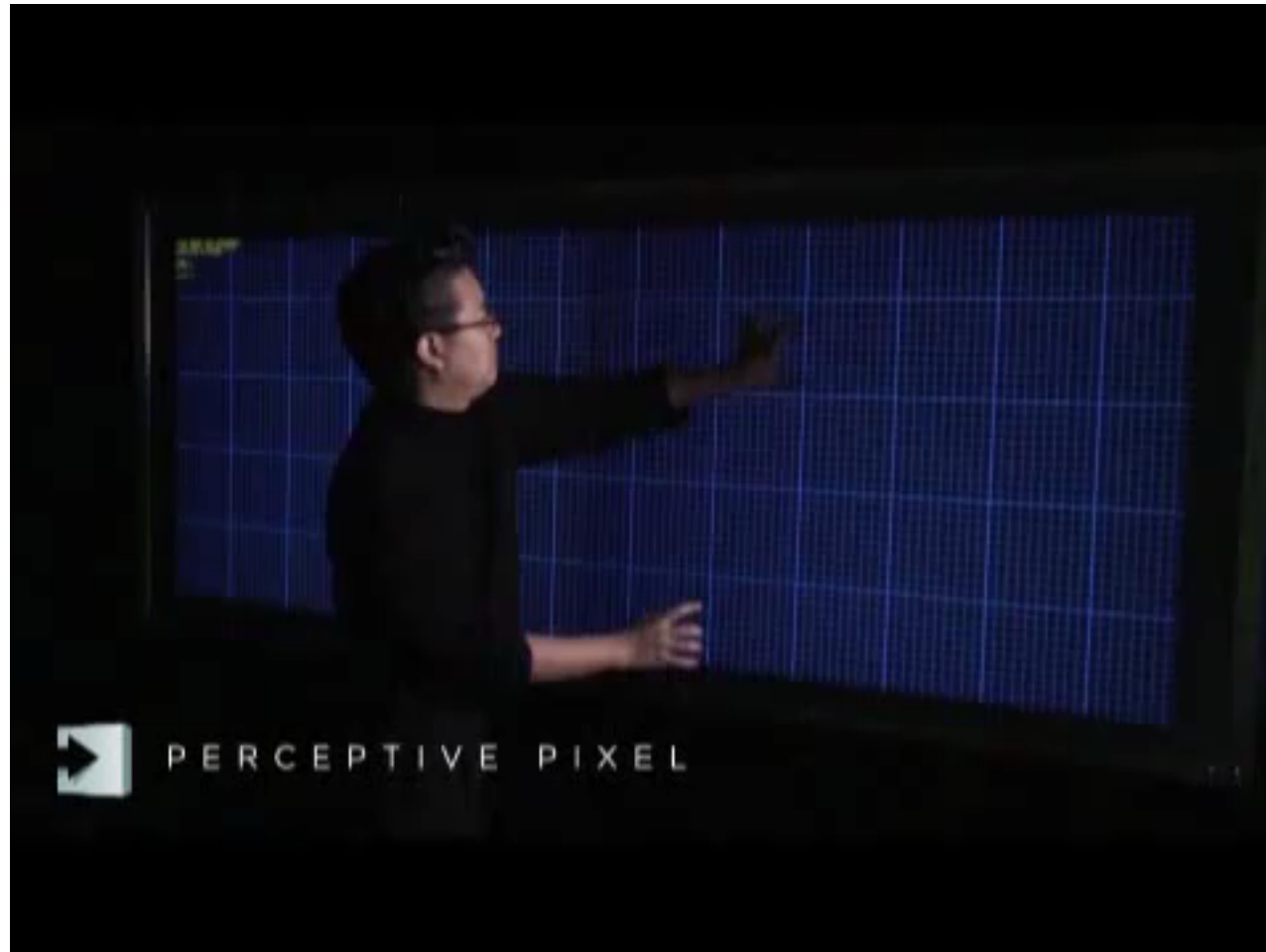


IS THIS A GOOD IDEA? WHEN?



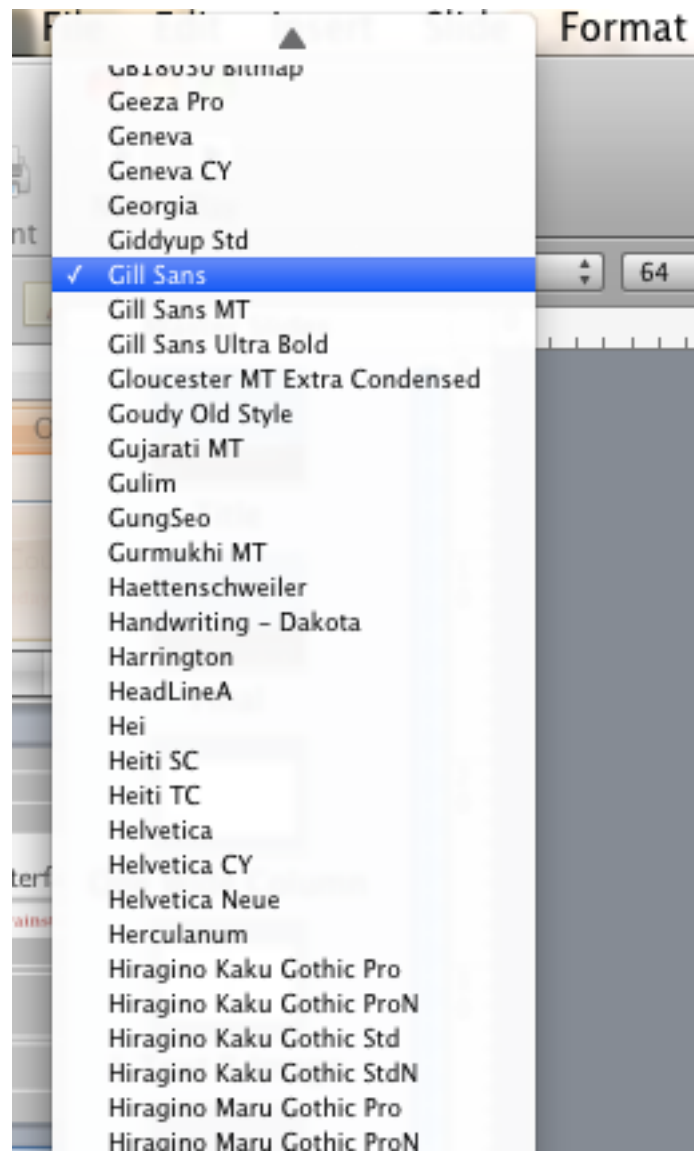
<http://www.bumptop.com>

HOW ABOUT THIS?

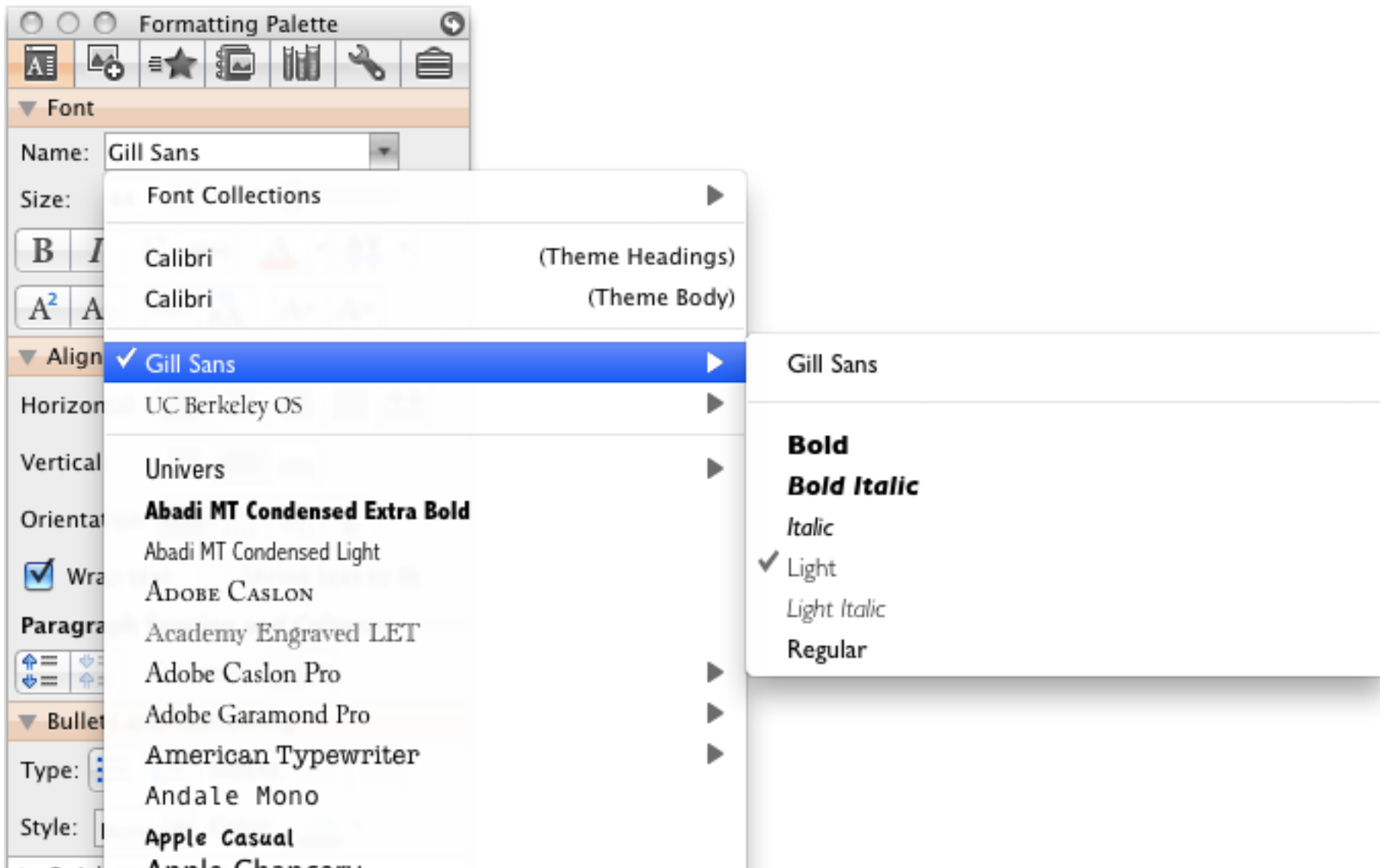


Jeff Han,
Perceptive Pixel

FONT SELECTION IN KEYNOTE



FONT SELECTION IN POWERPOINT

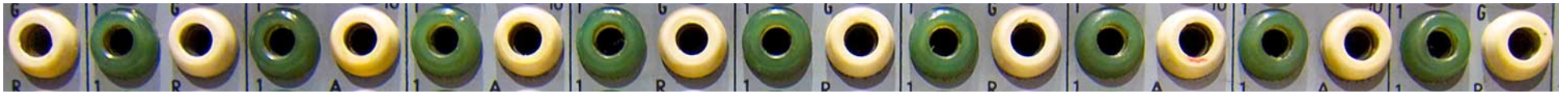


TOPICS FOR TODAY

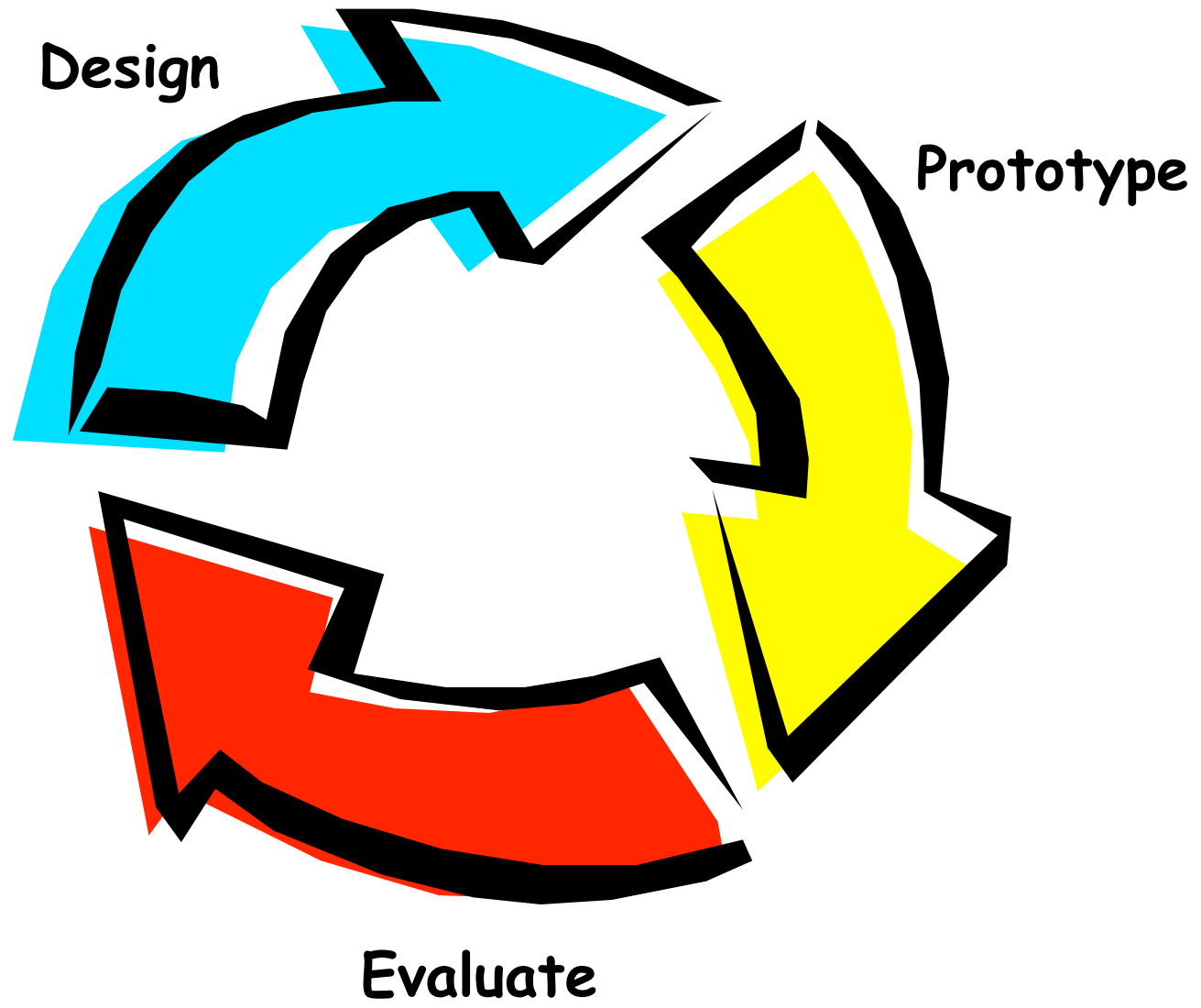
THE DESIGN CYCLE

BRAINSTORMING

CRITIQUE



THE DESIGN CYCLE

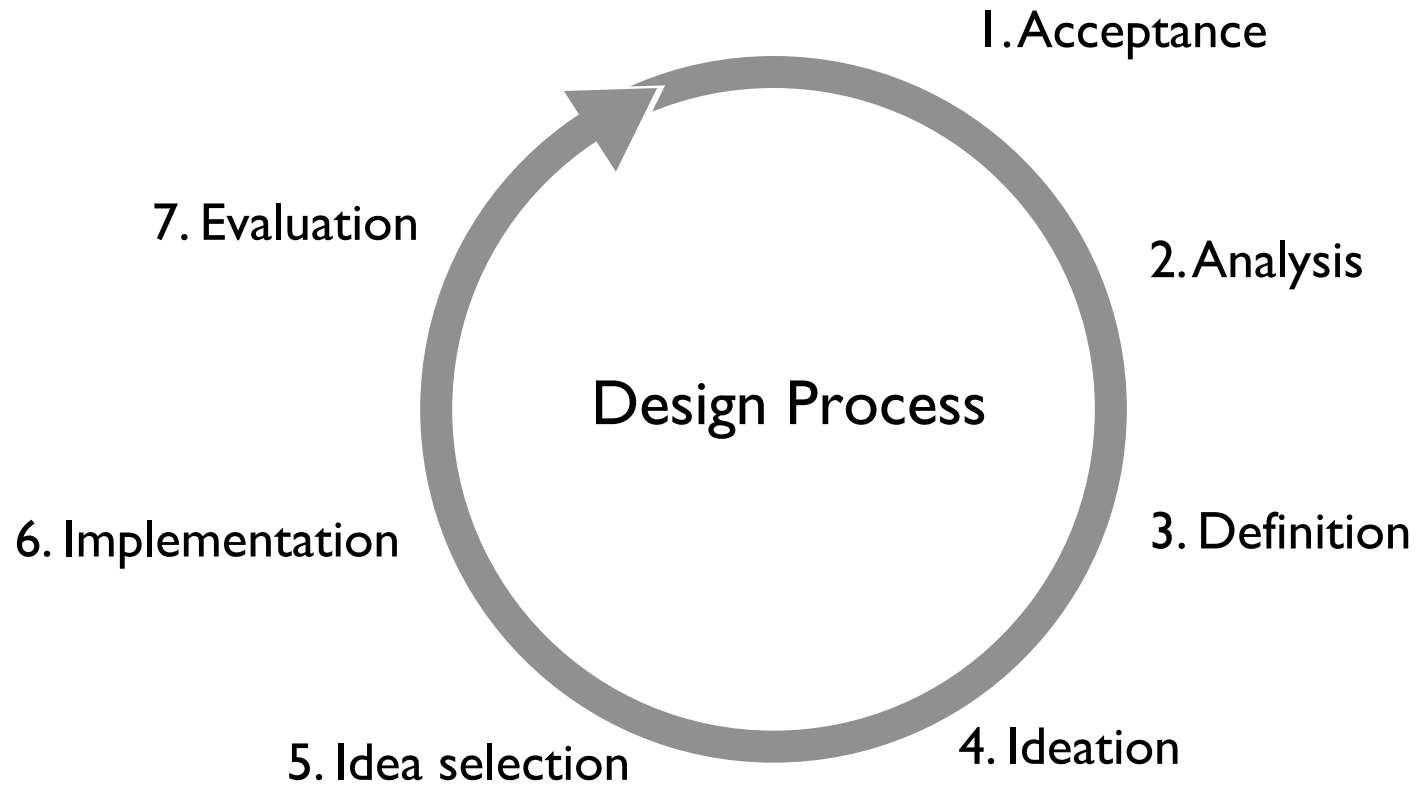


THE ART OF UI DESIGN

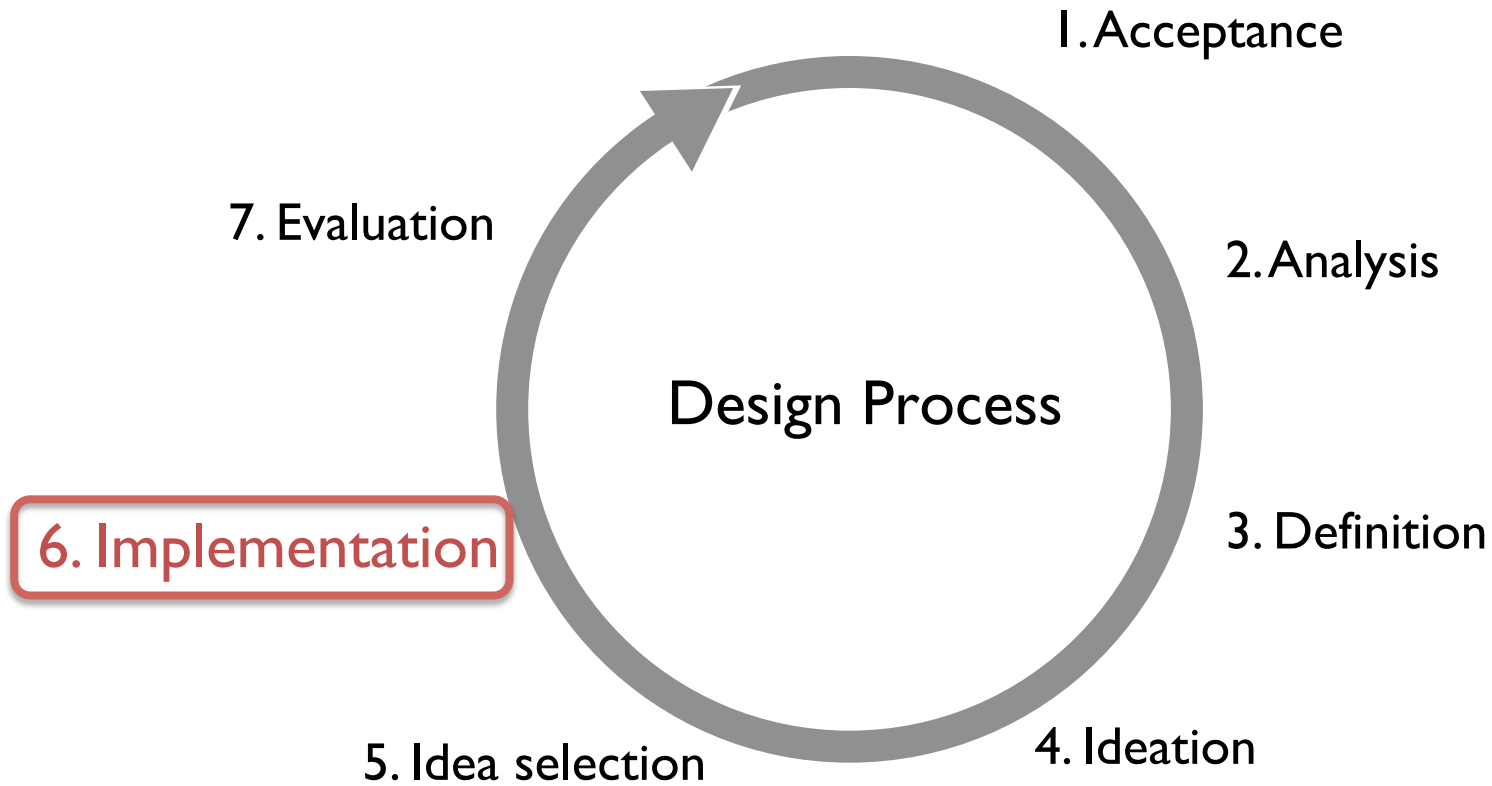


A soufflé is eggs, butter, milk & flour, but the difference between soaring and sinking is in the execution.

THE DESIGN PROCESS [KOBBERG & BAGNALL]



THE DESIGN PROCESS [KOBBERG & BAGNALL]



ACCEPTANCE

Getting started

Because of a deadline

Because of possible reward

Because you are forced to

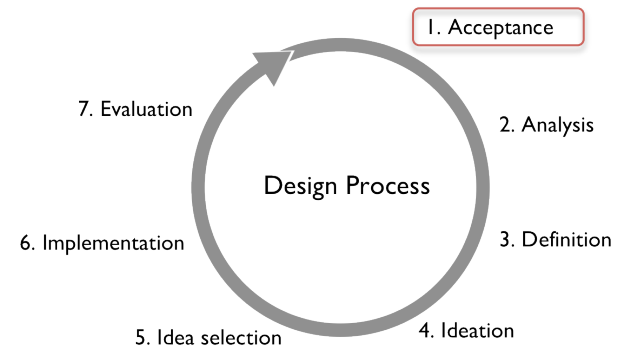
Commitment

Time

Resources

Responsibility

Key is to set motivation



ANALYSIS

Understand Users and Tasks

Who are the users?

What are their tasks?

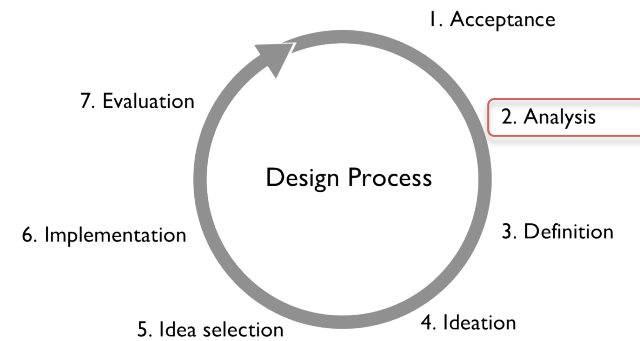
Observe and test, don't guess

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

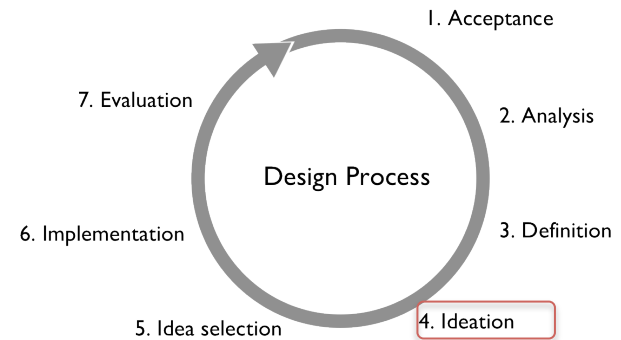
Stay focused

Encourage wild ideas

Defer judgment

Build upon idea from others

Aim for quantity!



IDEA SELECTION

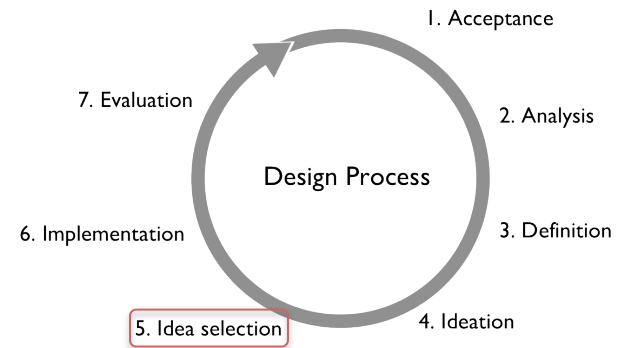
Define importance of each idea

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

Rank ideas according the your criteria

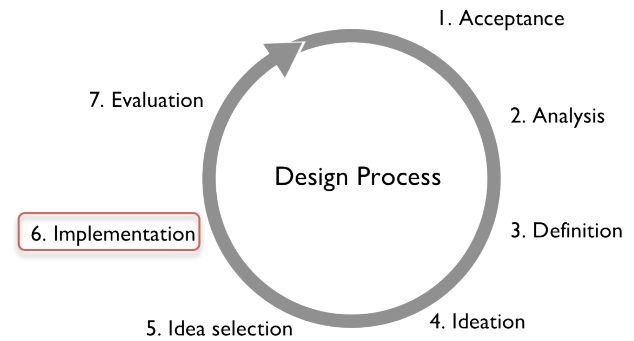
Pick top N

Choices depend on resources and stage of the project



IMPLEMENTATION

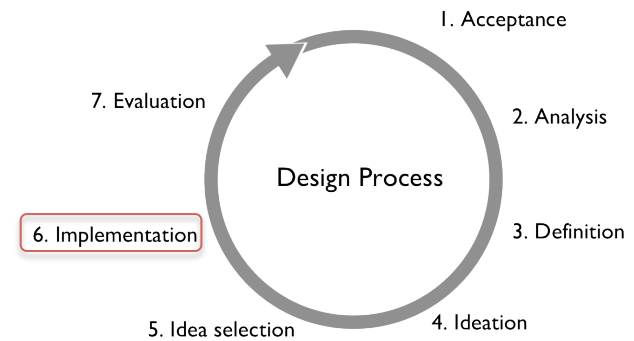
Scale up low → high fidelity



IMPLEMENTATION

Scale up low → high fidelity

Low-fidelity (quick, cheap, dirty)
sketches, paper models, foam core, ...



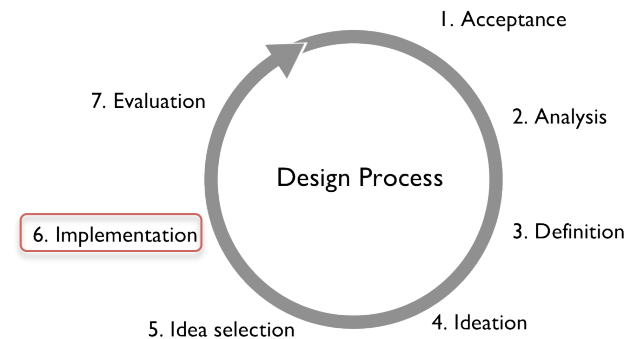
IMPLEMENTATION

Scale up low → high fidelity

Low-fidelity (quick, cheap, dirty)
sketches, paper models, foam core, ...

Medium fidelity
(slower, more expensive)

JavaScript, Framer, ...



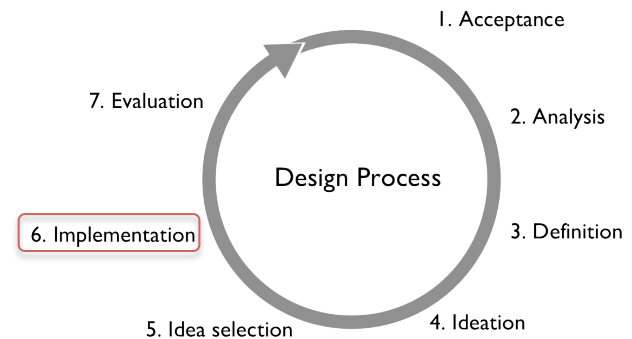
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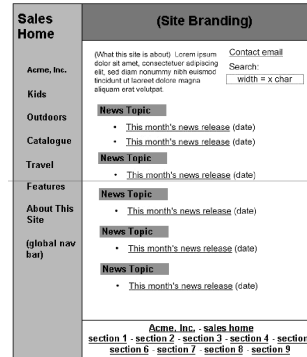
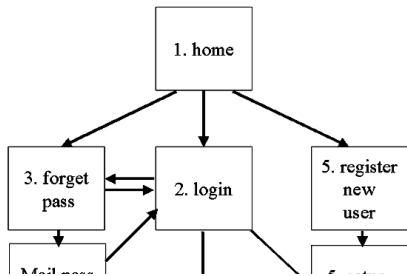
Medium fidelity
(slower, more expensive)
JavaScript, Framer, ...

High fidelity
(slowest, most expensive)
The full interface



IMPLEMENTATION EXAMPLE: WEB DESIGN

Site Maps → Storyboards → Schematics → Mock-ups



EVALUATION

Many types of evaluation:

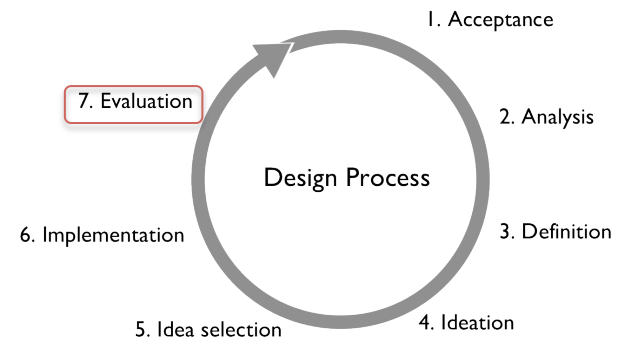
Prototype walkthroughs

Think-aloud studies

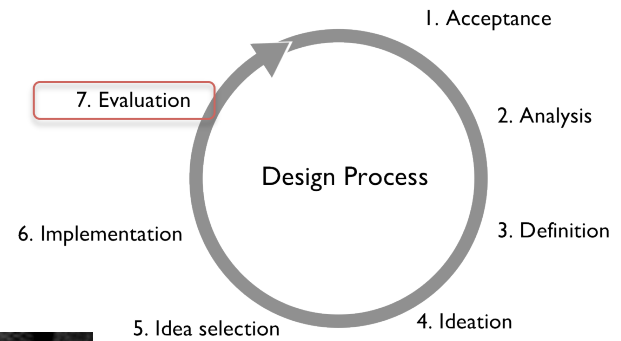
Wizard-of-Oz

Performance comparisons

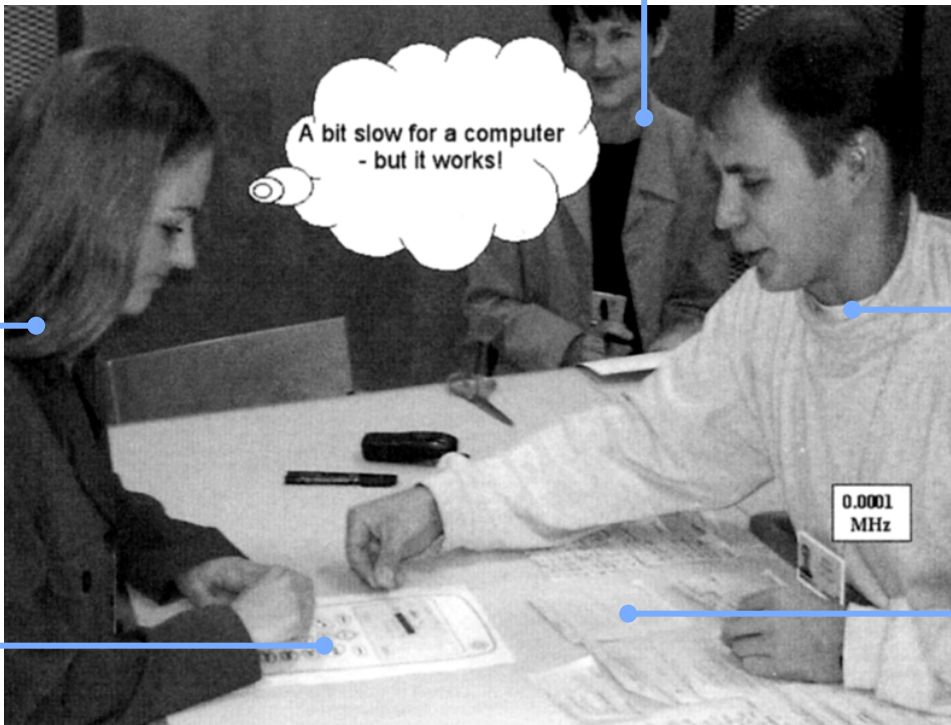
Type of evaluation chosen depends on the level of implementation, etc.



EVALUATION EXAMPLE: PAPER PROTOTYPE WALKTHROUGH



Observer
(or video camera)



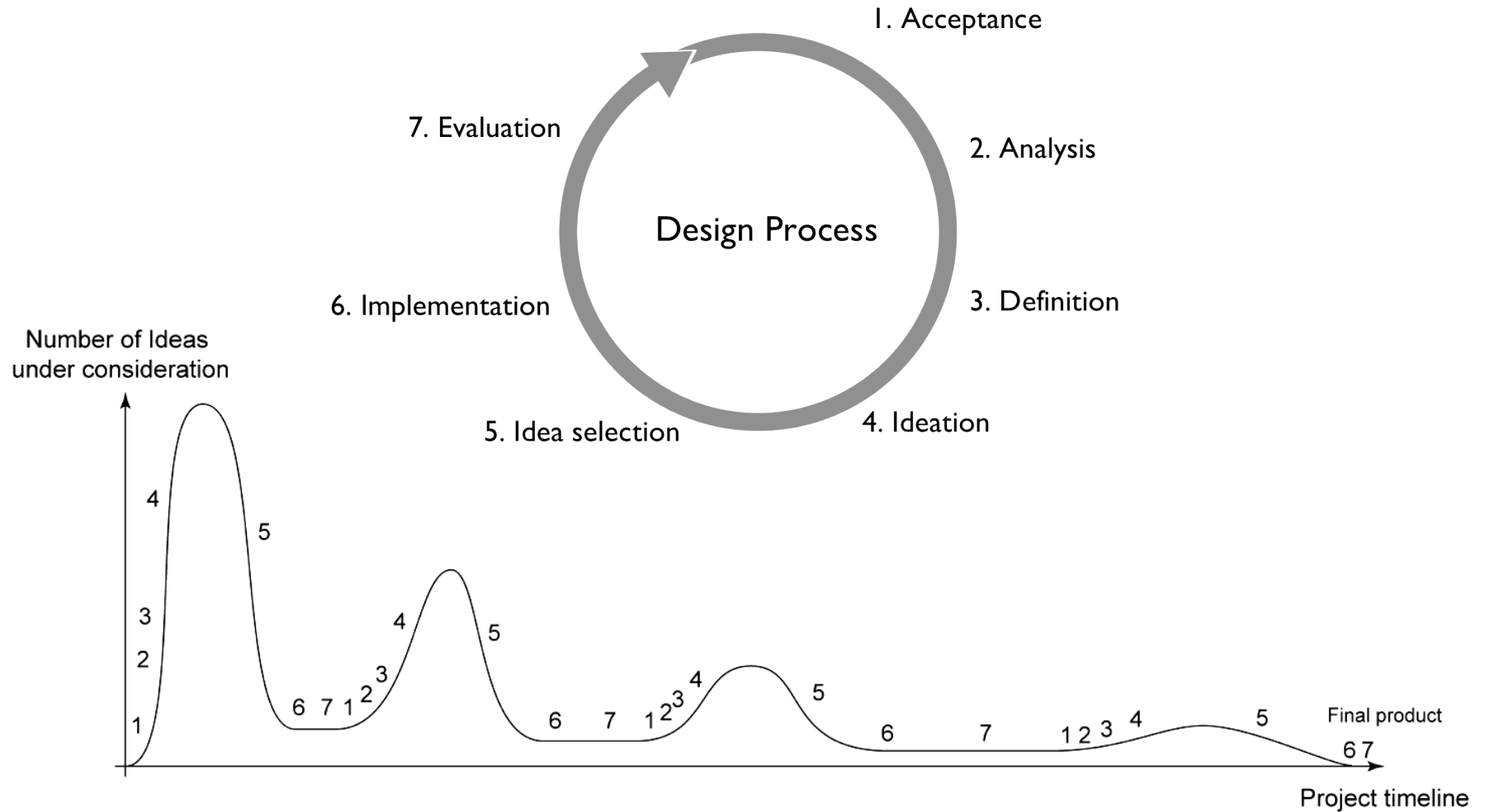
User

“Computer”

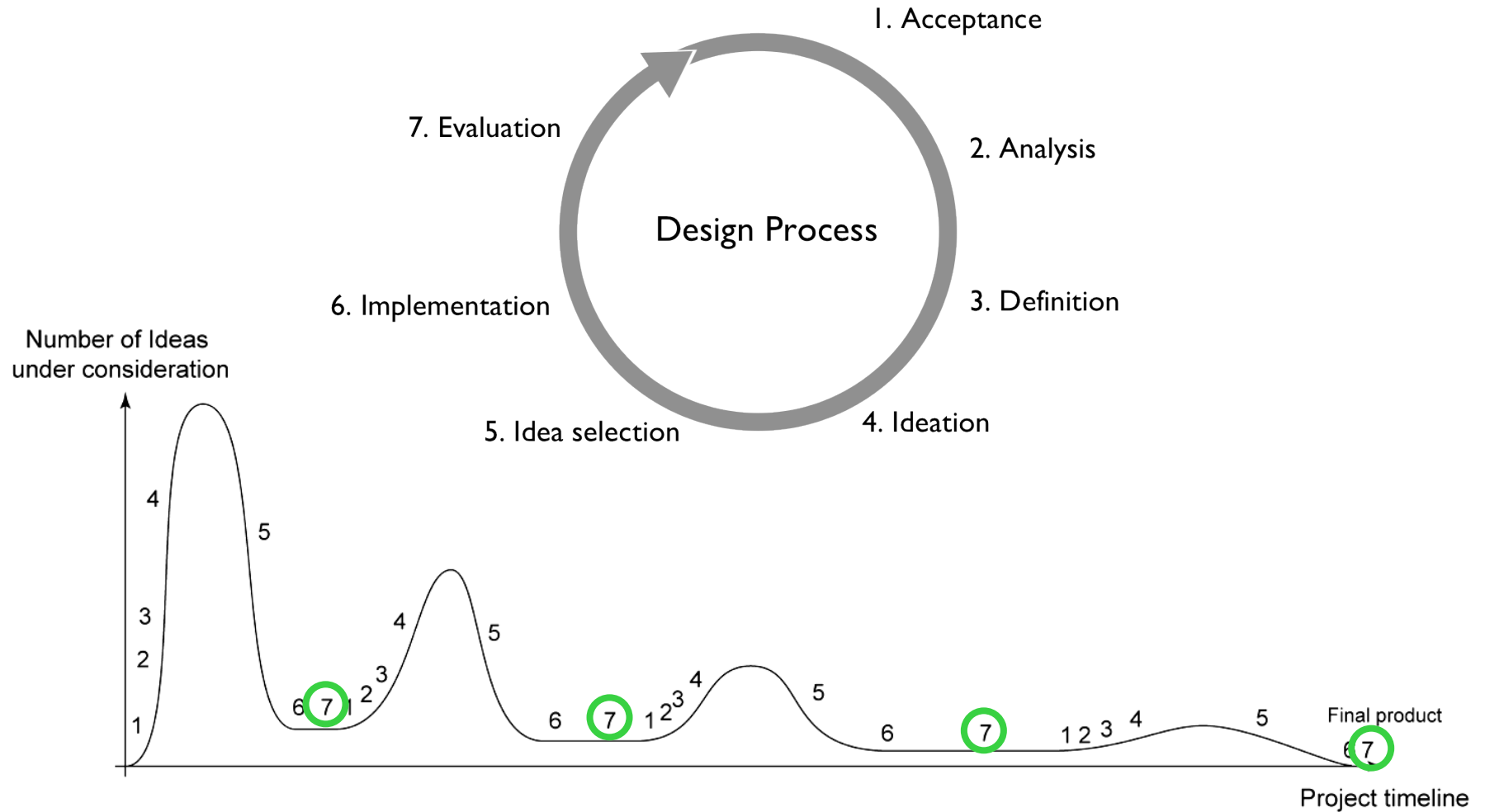
Interface

Interface elements

DESIGN CYCLE OVER PROJECT LIFESPAN

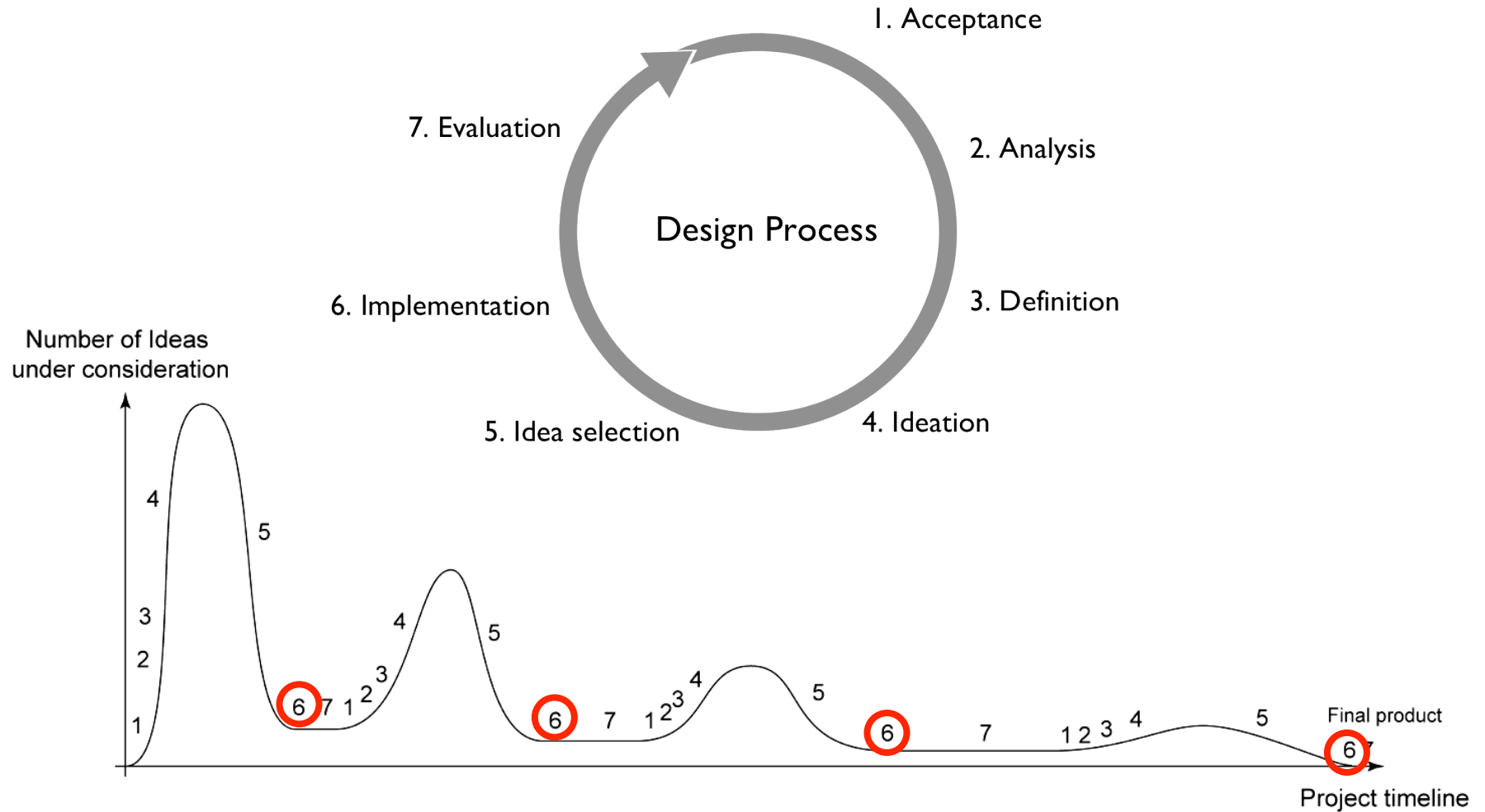


DESIGN CYCLE OVER PROJECT LIFESPAN



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

COMPARISON

[Lewis & Rieman]

Who will use?

What are their tasks?

Plagiarize

Rough out a design

Think about design

Create a prototype

Test it with users

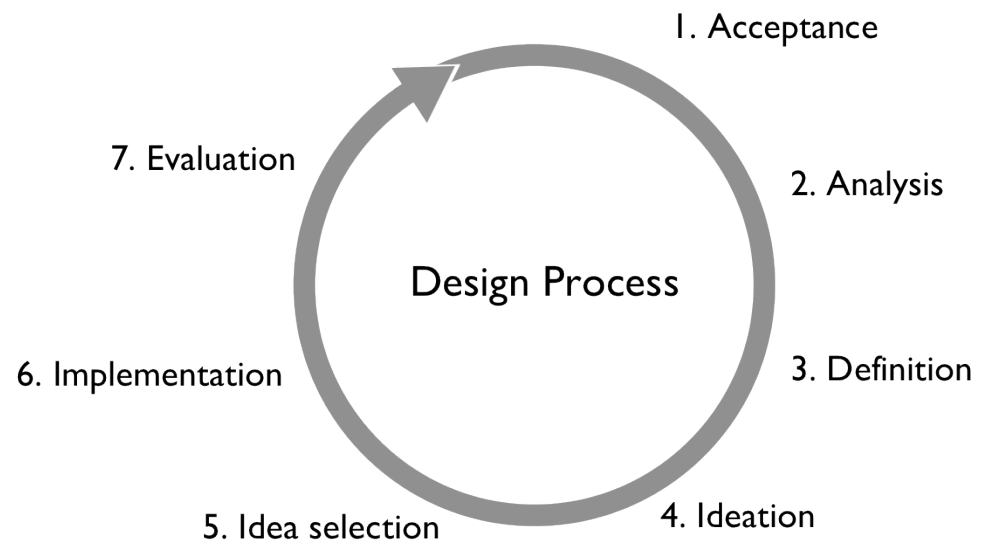
Iterate

Build a production version

Track use

Evolve the design

[Koberg & Bagnall]

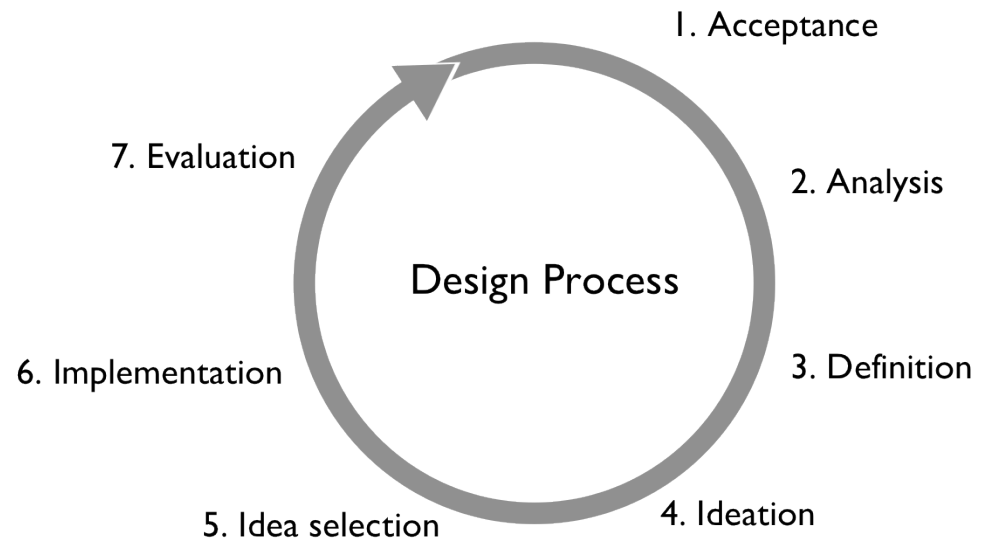


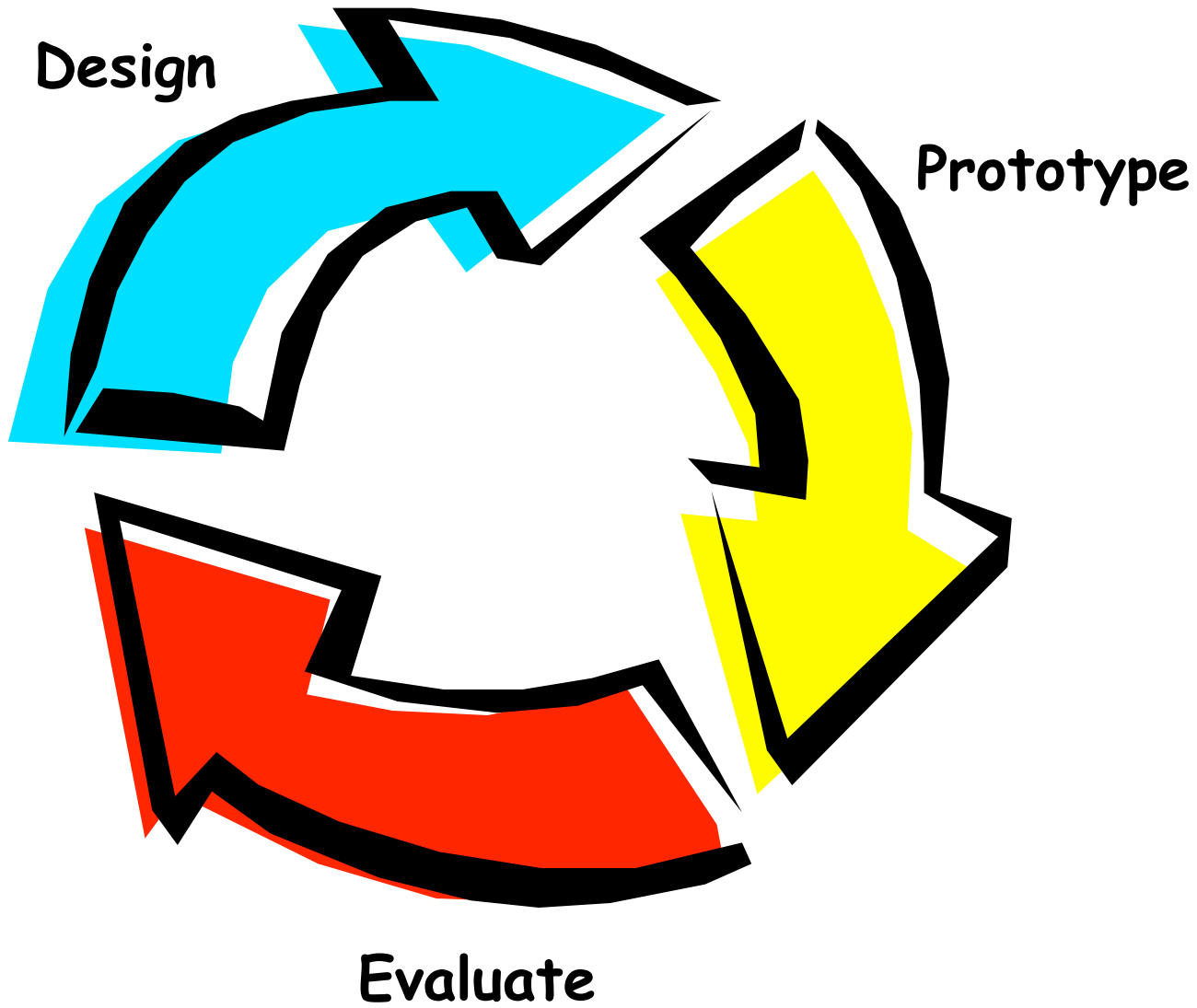
COMPARISON

[Lewis & Rieman]

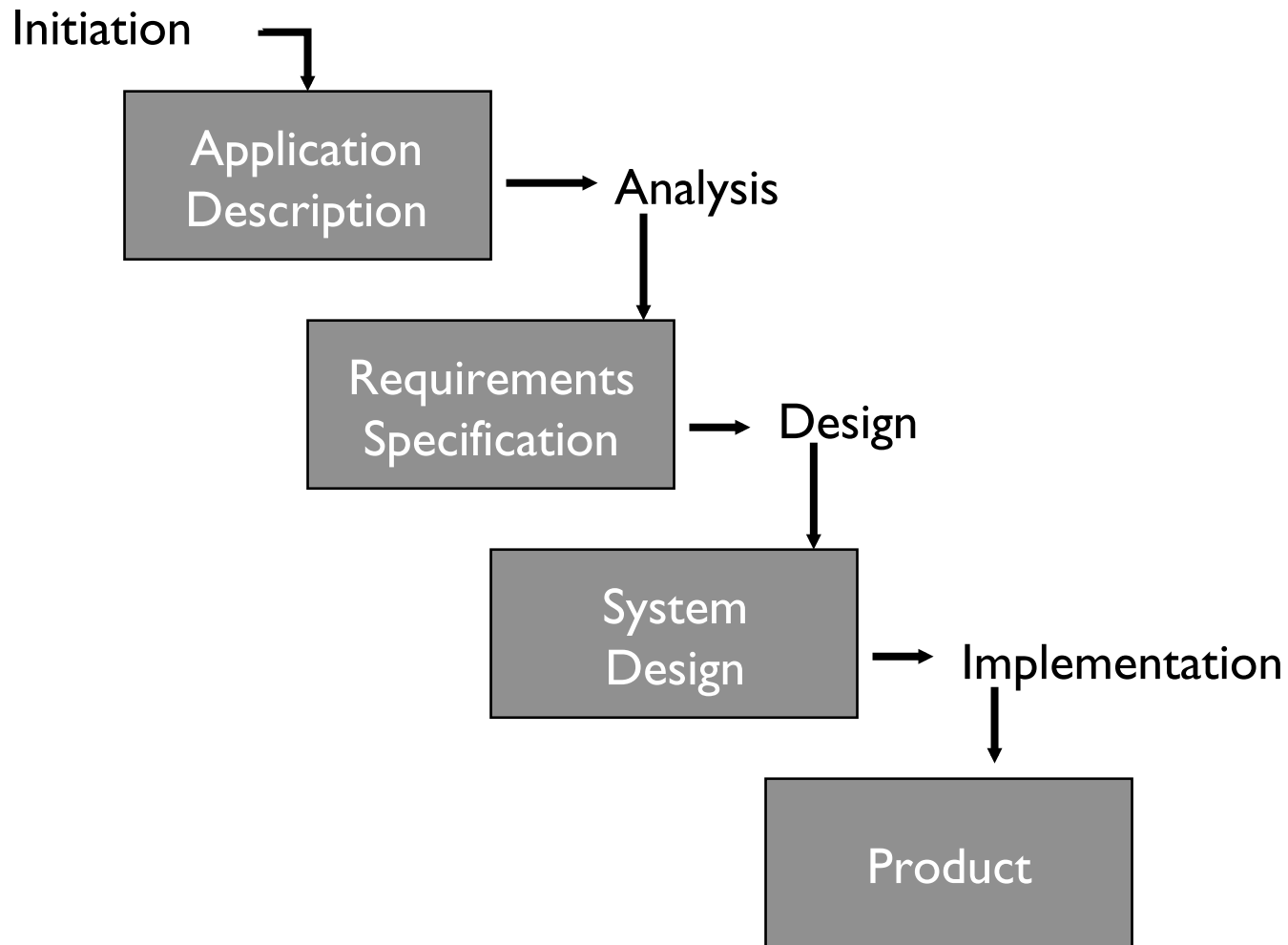
Who will use? [2]
What are their tasks? [2]
Plagiarize [4]
Rough out a design [4,6]
Think about design [5]
Create a prototype [6]
Test it with users [7]
Iterate [7->1]
Build a prod. version [6]
Track use [7]
Evolve the design [7->1]

[Koberg & Bagnall]





WATERFALL MODEL (SOFT. ENG.)



COMPARISON

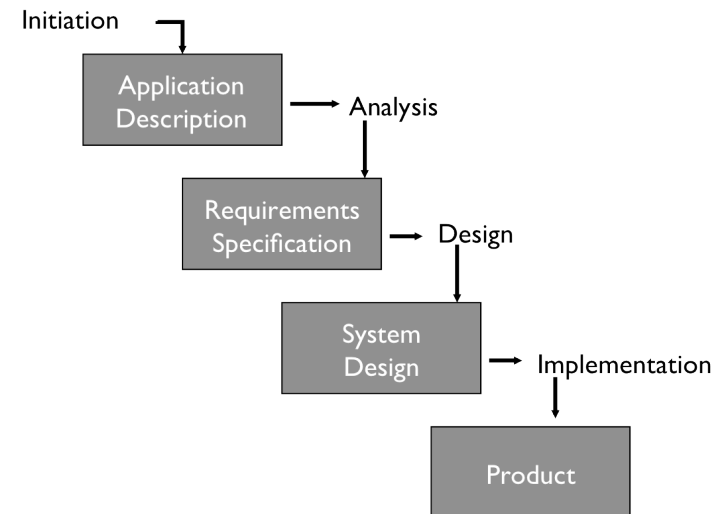
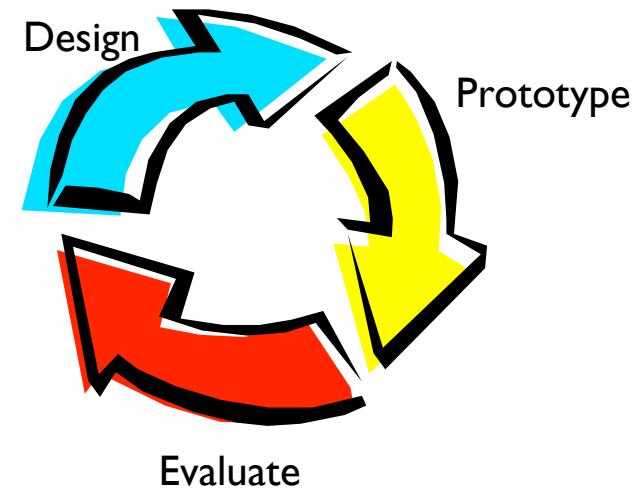
Focus differs

WF has no feedback

High cost of fixing errors:
increases by 10x at each
stage

Iterative design finds
problems earlier

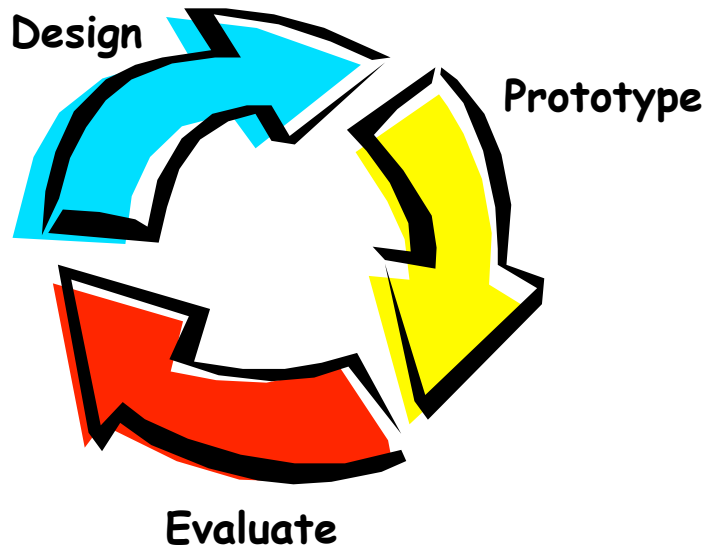
True for modern web
applications?





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?

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BRAINSTORMING

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UNIVERSITY OF CALIFORNIA



Berkeley

THE PSYCHOLOGY OF CREATIVITY

Conformity: the enemy of creativity

Groups and organizations encourage conformity



Part of "brand" or "corporate identity"



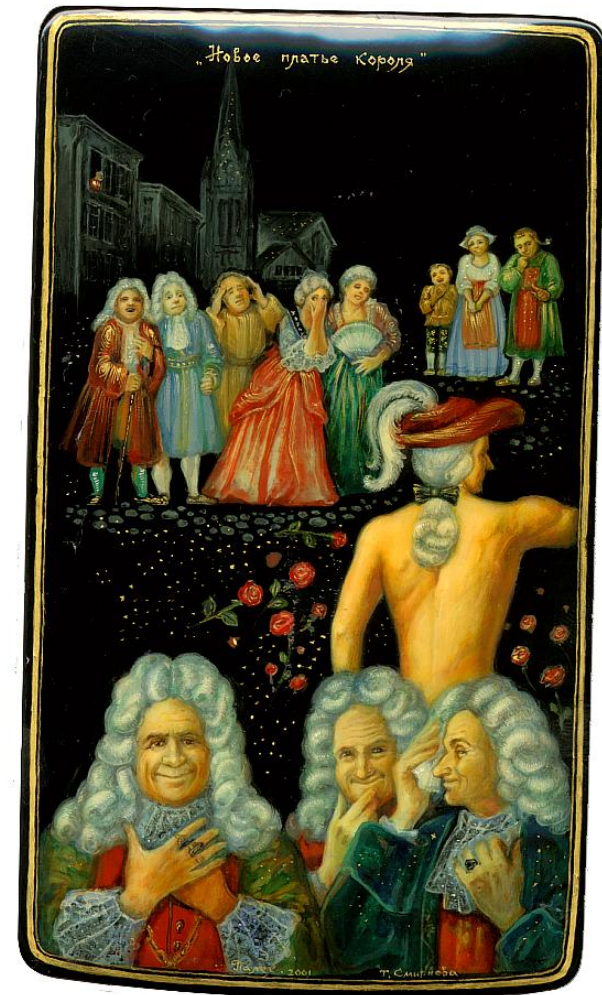
THE PSYCHOLOGY OF CREATIVITY

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

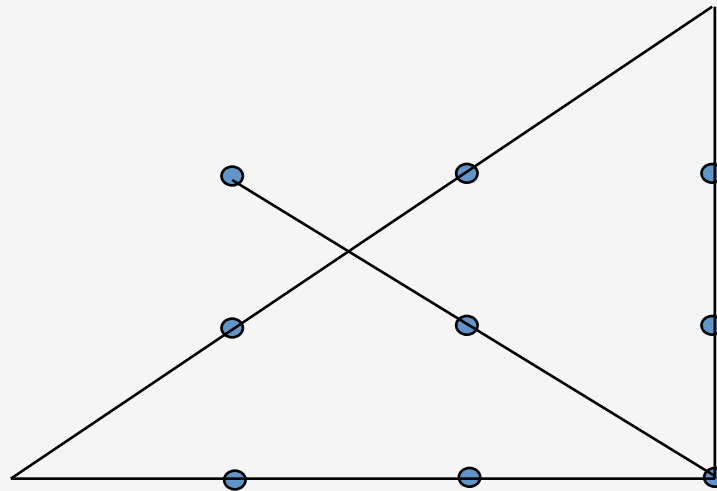
Dissent is not real: A deliberate “devil’s advocate” in the group can actually stifle dissent, because the majority know the opinion is manufactured.

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:

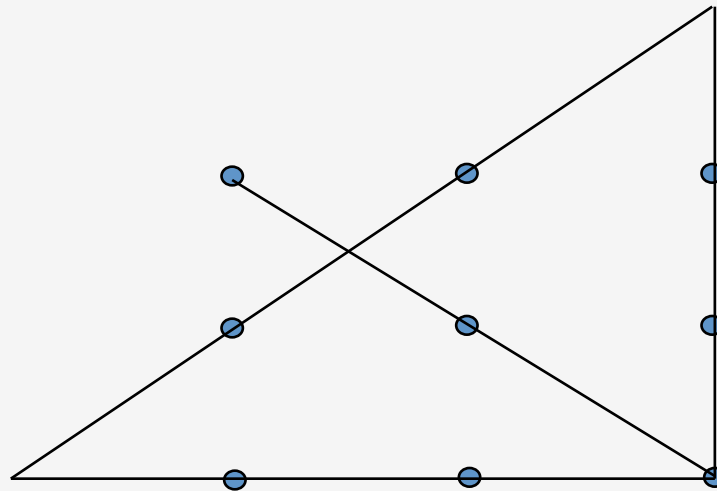


WHY IS THIS HARD?

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

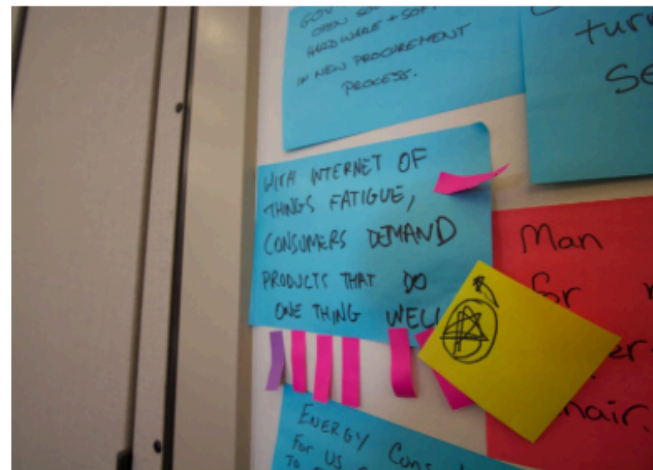
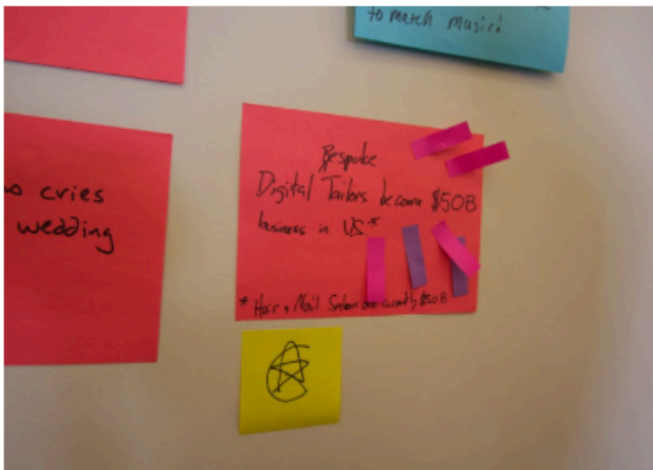
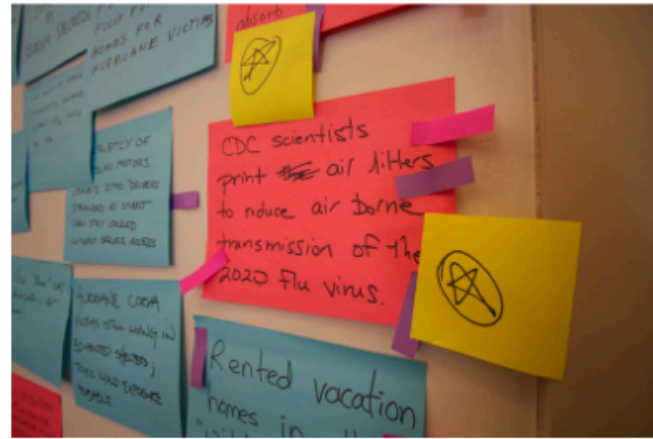
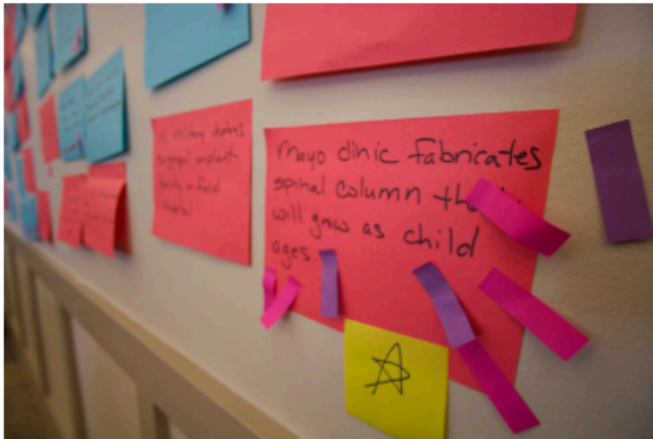
THE SPACE REMEMBERS

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





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

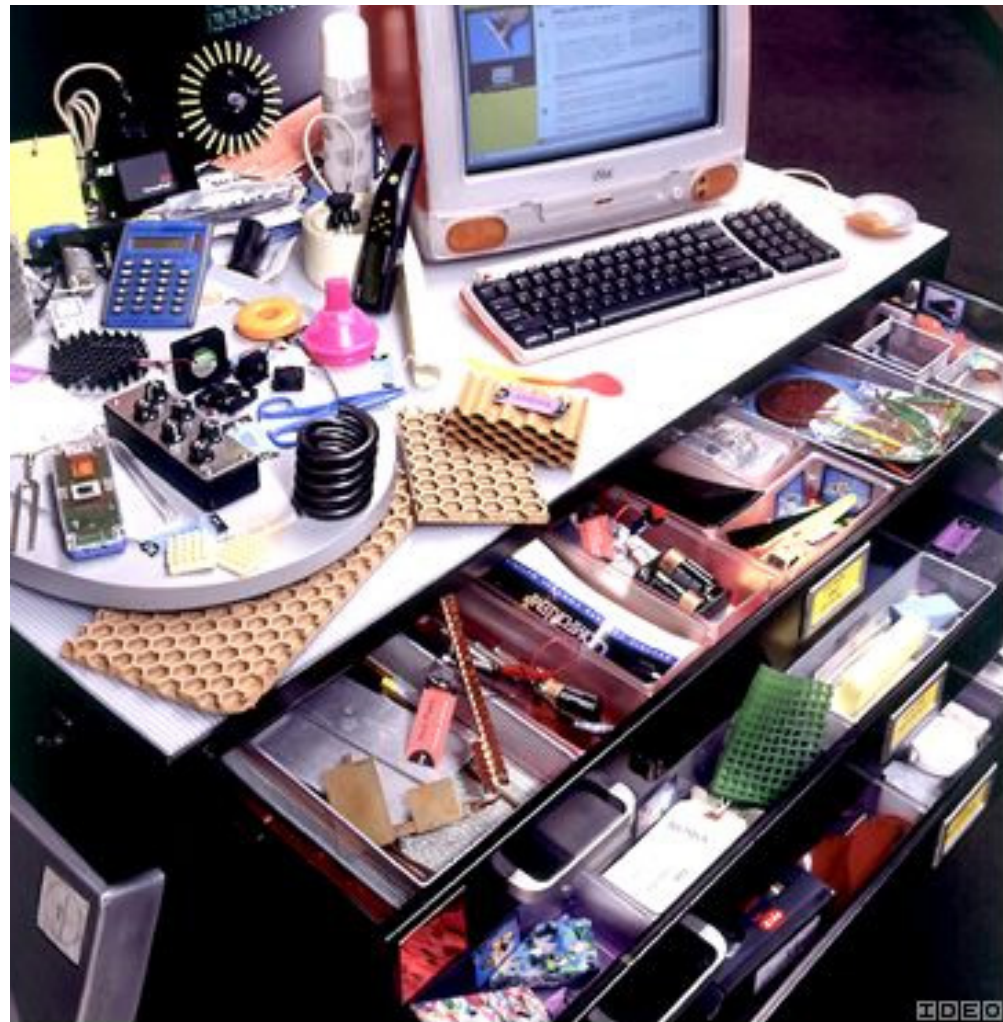


PHOTO: JOE WATSON

IDEO

GET PHYSICAL

Sketch

Make models

Act out



Moggridge, Designing Interactions, p.732

**Online discussion and
Web address information given
during this program may no
longer be accurate.**

**ABC has left these references
intact to preserve the
integrity of this program.**