

Building User Interfaces

Design Thinking

from Empathy to Ideas

Professor Bilge Mutlu

What will we learn today?


→ What does this mean?

- » Design thinking and process
- » Step 1: How to empathize with users
- » Step 2: How to turn data into insight
- » Step 3: How to generate design ideas
- » Sketching, conceptual design, storyboarding

What is *design thinking*?

- Mindset
 - user-centered way
 - hands-on
 - problem-driven
- Process
 - 6-step process

NN/g

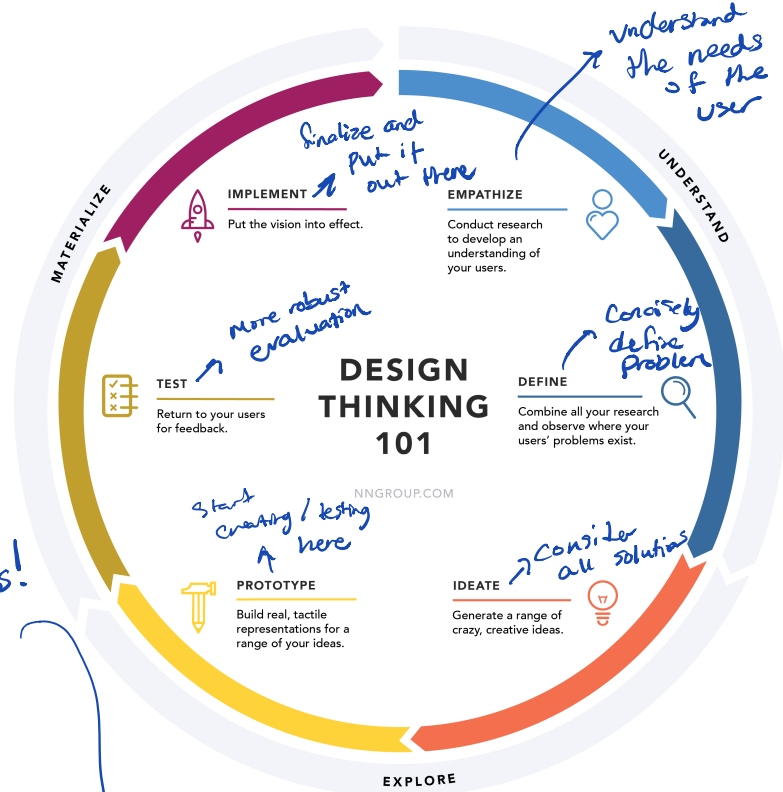


Design Thinking
101

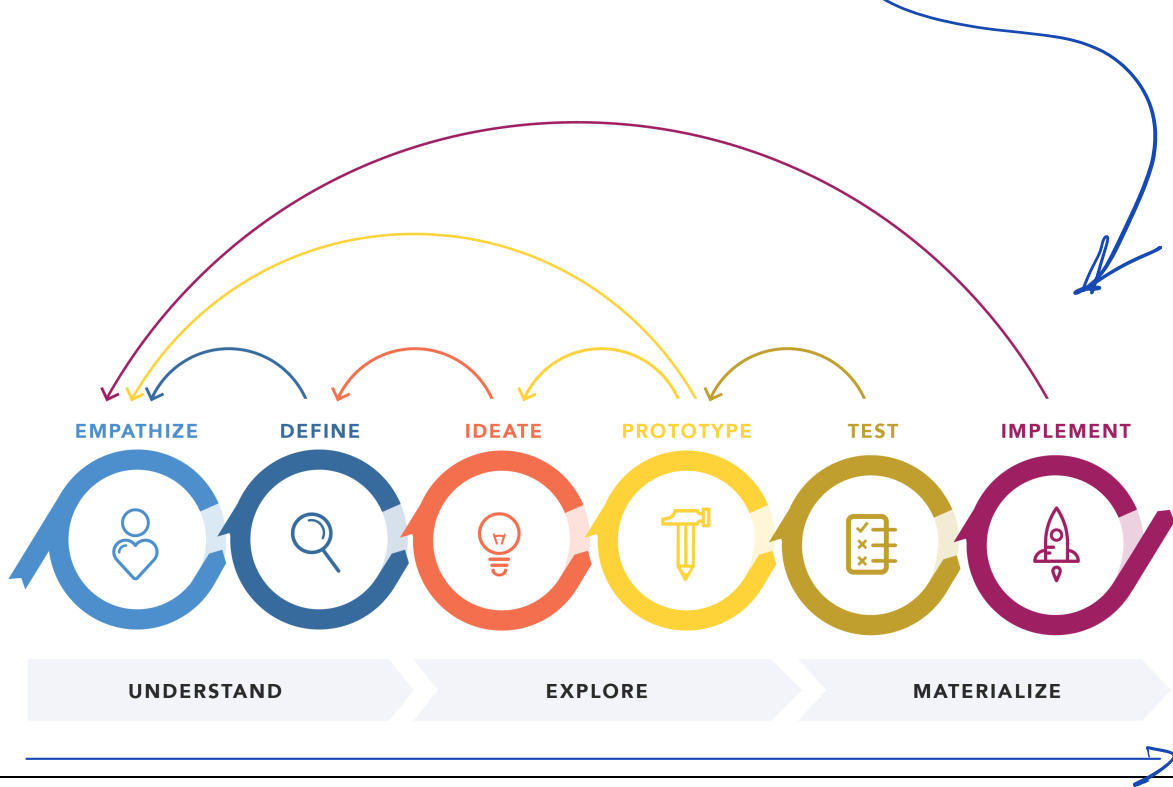
Design thinking has two components:

1. An **approach**: a hands-on, user-centric approach to innovative problem solving
2. A **process**: a 6-phase process to understand problems, explore solutions, and materialize them

Source²



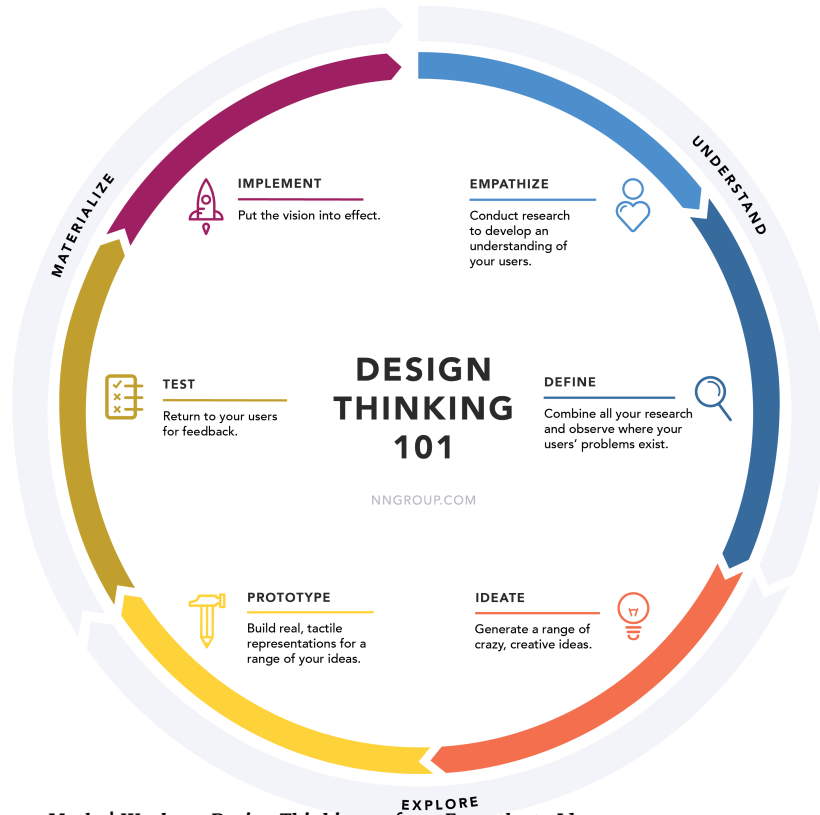
² [NN/g Design Thinking](#)



³NN/g Design Thinking

Takeaways

1. Approach problems like a designer
2. Follow a process



Empathize

(aka User Research)

Need-Finding / Customer Research

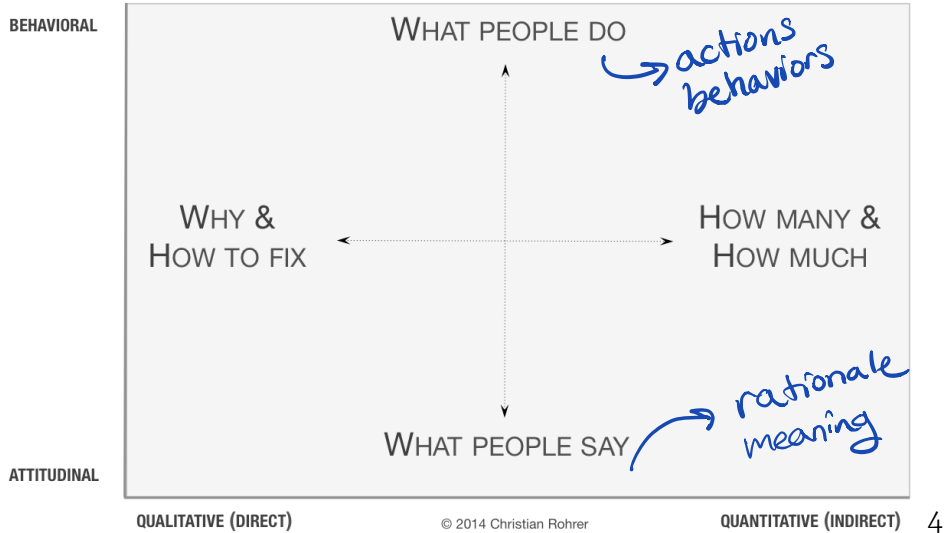
How do we empathize with users?

Understanding user needs, preferences, and expectations by studying what users do, say, think, and feel.

There are many methods to build empathy.

Let's pick one really good method → Think-Aloud

QUESTIONS ANSWERED BY RESEARCH METHODS ACROSS THE LANDSCAPE



⁴NN/g UX Research Methods

The simplest and most powerful method for empathy:

Think-alouds

"The #1 Usability Tool" — Jakob Nielsen

Comes from cognitive psych,
attempts to understand the thought
process of individuals

Source⁵



⁵Nomensa

How to conduct a think-aloud

1. Identify representative users → students

2. Ask users to perform representative tasks → add a class

3. Observe and record what they say and do

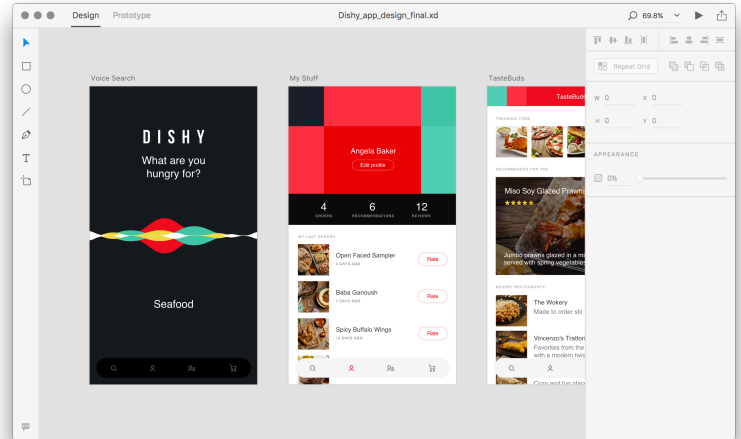
4. Analyze your data to develop design insight

→ search
→ etc.

Think about
the course
registration
system

An example: *Adobe XD*

I need a volunteer.



What you should do

Do: Write down one key observation on a post-it note, hold onto your post-it note until later

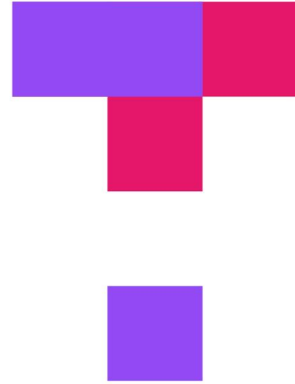
Pro tip: Write concisely but in a way that others can understand; write the name of the source; color-code types of note; use a Sharpie!⁷



After the T.A., interview the user!

⁷Cooper-Wright

TopHat Question



TOP HAT

Adobe XD

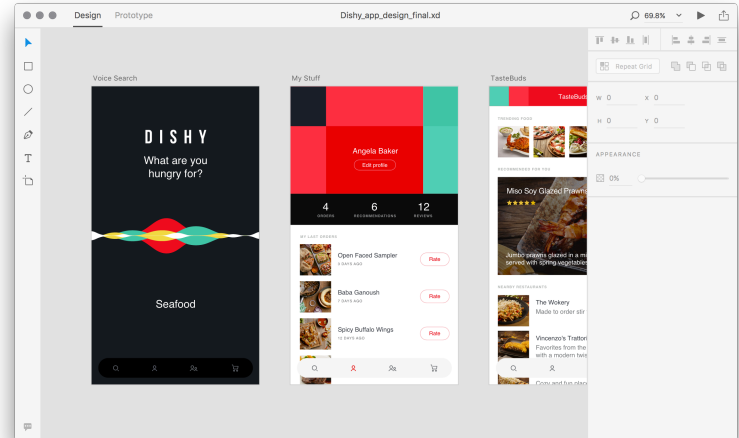
Task 1: Start a new design for the web at size 800 x 600.

Task 2: Create a red button in the center of the canvas.

Task 3: Create a second canvas and place a blue button in the center.

Task 4: Link red button to second canvas and blue button to first.

Task 5: Simulate your design.



More on the TA methods

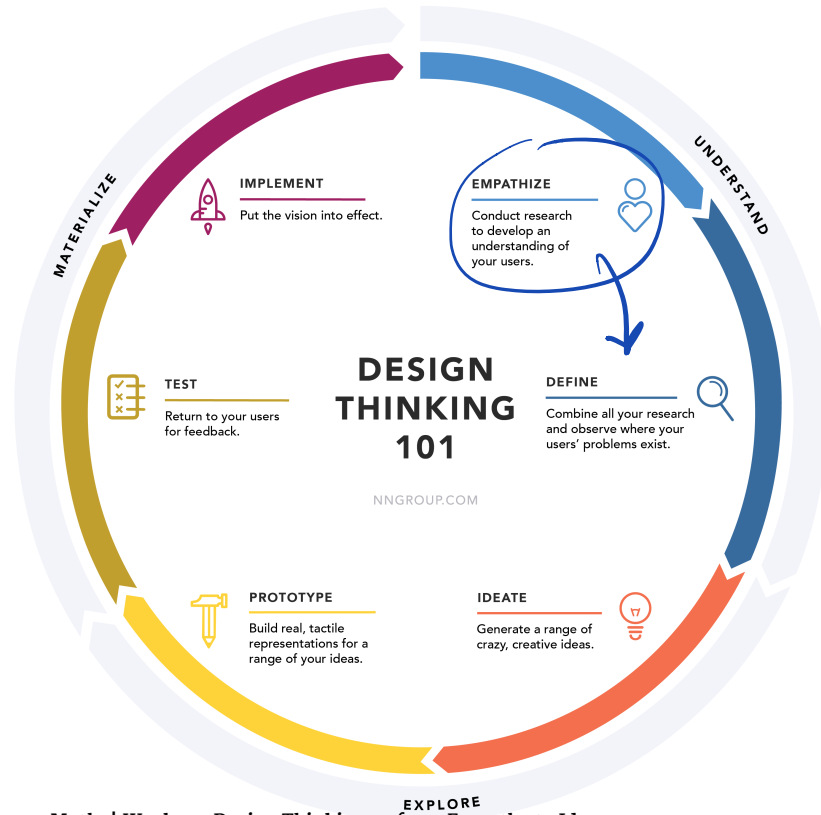
>> Can be done *concurrently* or retrospectively

→ video-record
and analyze
after

>> Can be applied to pretty much anything

>> Can be done *before* or *after* design

↳ can be part of iterative
refinement!



Define

What does that mean?

- » Gathering all findings — **gather**
- » Consolidating, categorizing, distilling — **analyze**
- » Translate into insight — **recommend**

*-video
-scribbles
-notes*

But how do we go about this?

- » Again, there are many methods for analysis.
- » The simplest and most powerful method is affinity diagramming.

Affinity Diagramming

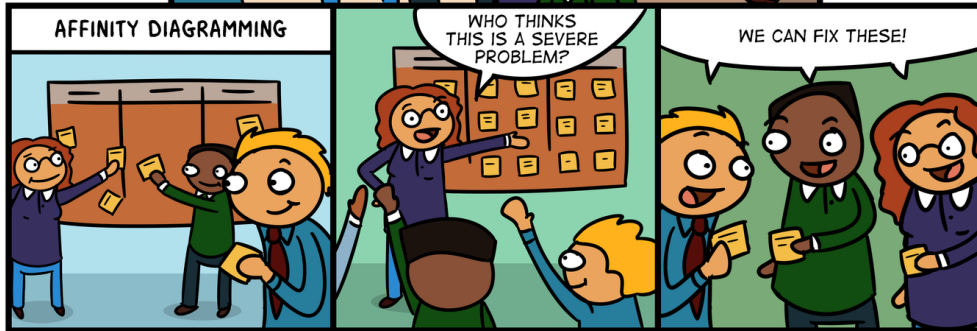
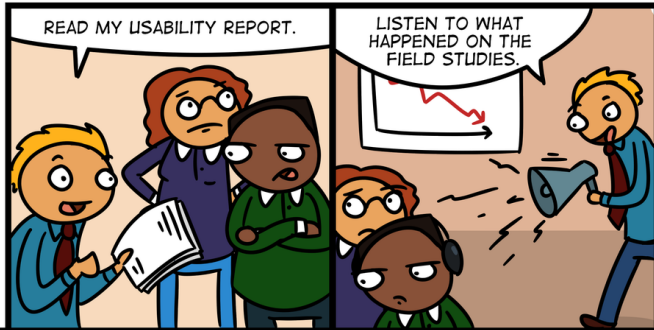
What is it?

- >> **Definition:** Organizing data into clusters based on "affinity."
- >> It helps you make sense of qualitative, messy data.
- >> Also known as *affinity mapping*, *collaborative sorting*, *snowballing*.
- >> Used across the board in creative, generative industries.

- similarity
- theme



↑
can be
categorical,
hierarchical



NN/g GROUP.COM NN/g

⁶ NN/g Affinity Diagramming

How do we go about it?

↗ could be based on:
- tasks
- procedures
- expected errors

- » **Step 1:** Start an initial set of categories
- » **Step 2:** Sort notes into these categories
- » **Step 3:** Add subcategories or consolidate categories as needed
- » **Step 4:** Present each category
- » **Step 5:** Rank categories in severity, combining importance, prevalence, frequency

↙ how integral is it to the process?

↓ how much does it appear in the interaction?

← how often does it appear?

How do we go about it? Continued.

Pro Tip: Steps 2–3 will likely be iterative.

Pro Tip: Assign team members to categories who will be responsible for all the sorting and presentation of the categories

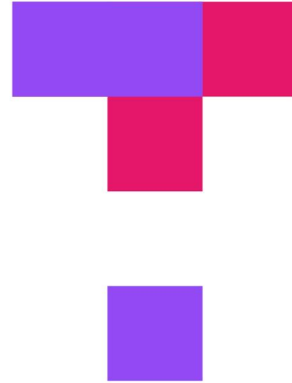
Source: UX Collective



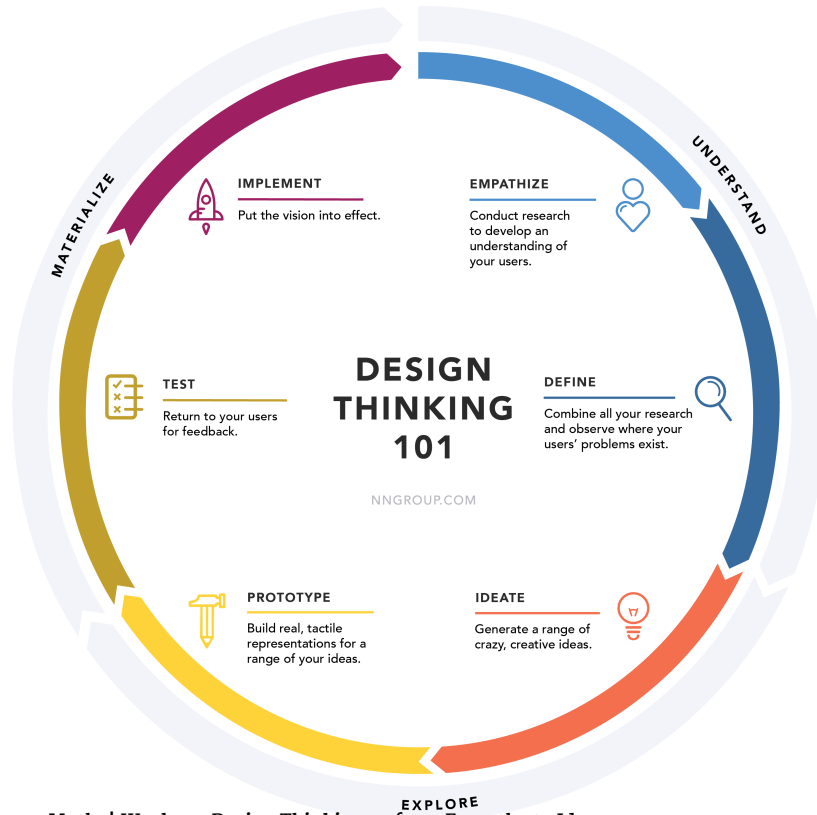
Voilà!

Your findings will serve as *design insight*.

TopHat Question



TOP HAT



Ideate

Definition: An active, creative, exploratory, highly iterative, fast-moving collaborative process for forming ideas for design.

Ideation can be done *individually* or *collaboratively*.

Ideation has two stages:
Idea creation → Critiquing

generative

evaluative

Key considerations

- » Workspace
- » Team
- » Process
- » Rules of engagement
- » Method of capturing ideas

need to be able to sketch / move things around

Source⁸

Brainstorming for design

⁸GlassDoor

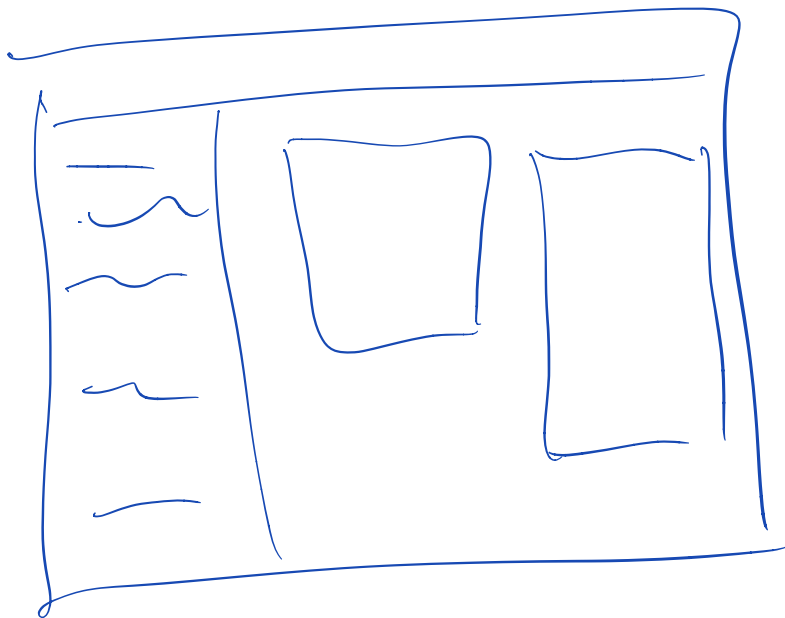


IDEO's Rules of Engagement

1. Defer judgement. ← don't judge until critique step
2. Encourage wild ideas. ← can serve as starts for other more realistic ideas
3. Build on the ideas of others. ← collaborative → you aren't stealing or counting contributions
4. Stay focused on the topic. ← move as a group together
5. One conversation at a time.
6. Be visual. ← draw / diagram / placement → sketching
7. Go for quantity.

Ideation \rightleftharpoons Sketching

Definition: A sketch is a quick and rough drawing that gives a general outline of an idea.

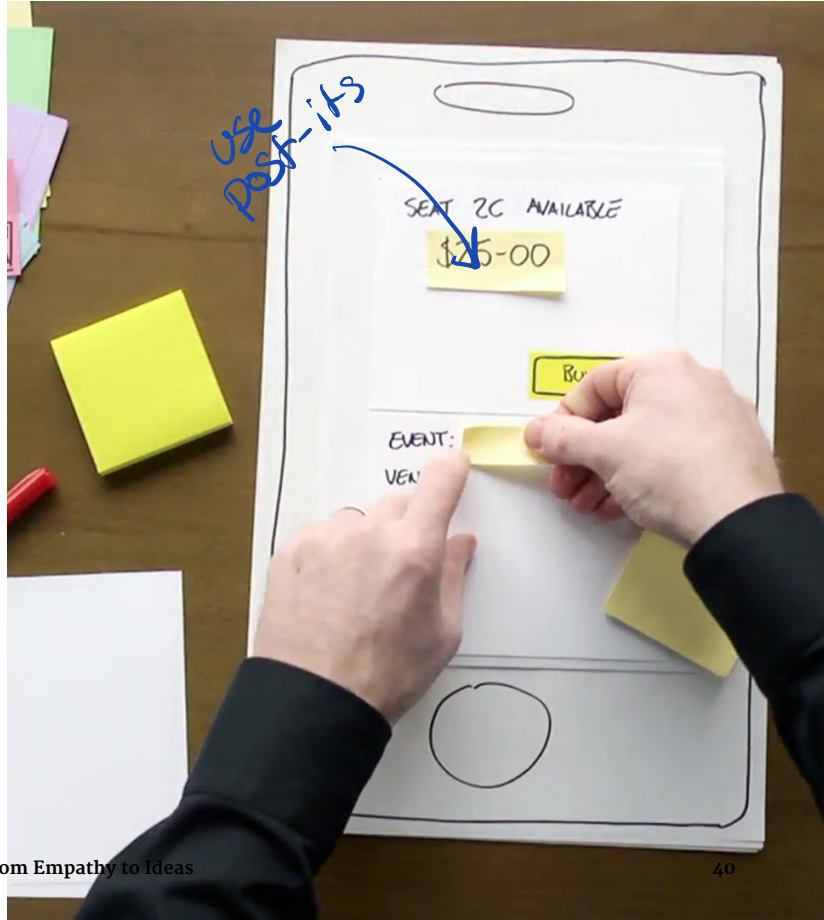


Sketching Principles¹⁰

- » Everyone can sketch
- » Sketching is more effective than words for most ideas
- » Quick and inexpensive sketches do not inhibit exploration
- » Sketches are disposable

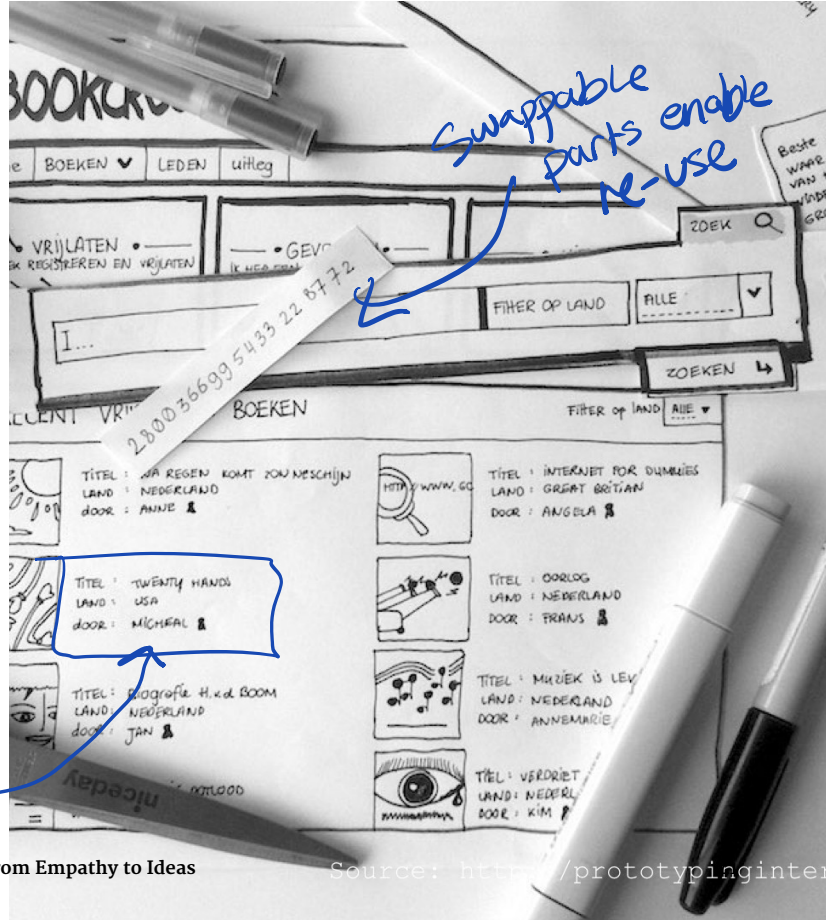
↓
don't get too attached

¹⁰Buxton, 2007



Sketching Principles¹⁰ Continued

- » Sketches are made just-in-time, in-the-moment, when needed
- » Sketches should be plentiful, entertain a large number of ideas, and include multiple sketches of each idea
- » Textual annotations can explain what is going on in the sketch



¹⁰ Buxton, 2007

Sketching can do more!¹¹

¹¹Medium

SKETCHING

FOR UX DESIGNERS

TOOLS:

JUST GRAB THE NEAREST PEN & PAPER!



IN CASE OF USER INTERFACES:
VARY THE FIDELITY/
DETAIL LEVEL BASED ON

YOUR GOAL
(DELIVERABLE?
QUICK (CONCEPT?)

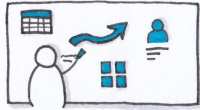
YOUR AUDIENCE
(CLIENT? TEAM?
YOURSELF?)



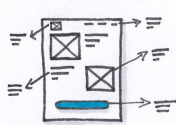
YOU CAN DRAW,
IT IS NOT ABOUT
BEING ARTISTIC!



JUST START IT, YOU'LL
BECOME MORE CONFIDENT
OVER TIME!



① FACILITATING MEETINGS &
DESIGN WORKSHOPS,
PROJECT PLANNING



② WIREFRAMING
DON'T FORGET:
ANNOTATIONS ARE GREAT!



③ PAPER PROTOTYPING -
VALIDATING IDEAS,
TESTING OUT CONCEPTS



④ IDEATION
QUICK IDEA GENERATION
(E.G. DURING A DESIGN SPRINT,
OR JUST ON YOUR OWN)



SHARED
UNDERSTANDING!

⑤ TEAMWORK, ANY KIND OF
COLLABORATION
(E.G.: "TALKING SKETCHES")



⑥ USER FLOWS
SITEMAPS
INFORMATION ARCHITECTURE



⑦ MAPPING: EMPATHY MAP,
JOURNEY MAP,
PRODUCT ROADMAP ETC.

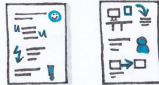


⑧ UI ANIMATIONS
WHAT CHANGES, HOW,
WHAT THE TRIGGER IS

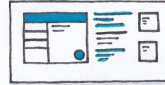
What do you expect users to do?



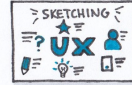
⑨ STORYBOARDING
VALIDATING
ASSUMPTIONS



⑩ APPLYING ICONS, VISUALS
IN UX RESEARCH NOTES
(E.G. USER INTERVIEW,
CONTEXTUAL INQUIRY)



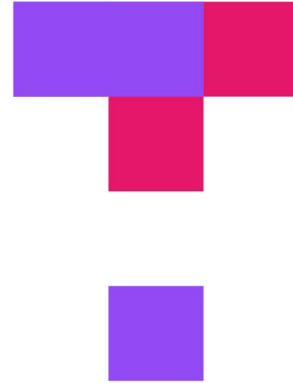
⑪ DOCUMENTATION,
PRESENTATION
TO CLARIFY &
TO MAKE IT MORE ENGAGING



⑫ SKETCHNOTING
- CONFERENCE TALKS
- BOOKS
- MEETINGS

CREATED BY KRISTINA SEEROVAY
WWW.SKETCHINGFORUX.COM

TopHat Question



TOP HAT

In ideation, sketches illustrate *conceptual designs*.

What is Conceptual Design?

Definition: An **abstract** characterization of the context, use, or experience with an envisioned design solution that highlights the main premise of the solution.




Storyboarding

sketches, but structured

usually 2-4 frames

Definition: A sequence of visual frames that illustrate user interaction with the envisioned system, capturing social, environmental, and technical factors that shape user experience.

Source¹²

STORYBOARD	PERSONA: CORPORATE BUMER, JAMES	SCENARIO: REPLENISH OFFICE SUPPLIES
		
<ul style="list-style-type: none">• MAKES NOTE OF SUPPLIES NEEDED ON CLIPBOARD• PHYSICAL INVENTORY	<ul style="list-style-type: none">• SELECTS ITEMS FROM FAVORITES LIST• USES DESKTOP + SUPPLY LIST AS TOOL	<ul style="list-style-type: none">• RECEIVES SHIPMENT WINDOW w/ ORDER SUBMISSION• SETS PLAN FOR RESTOCK

almost like a comic strip

¹² [NN/g: Storyboards Help Visualize UX Ideas](#)

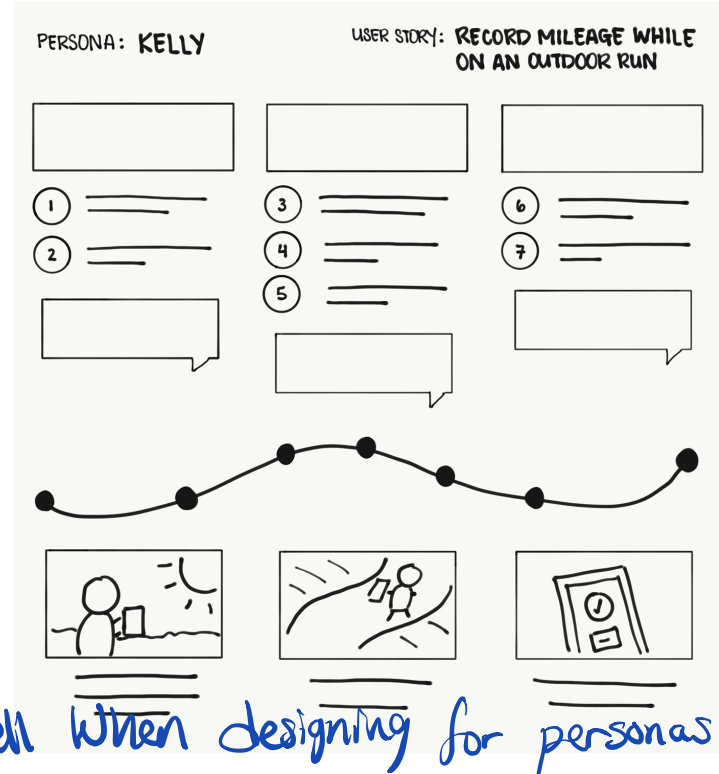
Journey Maps

Definition: A visualization of the process that a person goes through in order to accomplish a goal.

User actions, thoughts, and emotions mapped onto a timeline to create a narrative.

Source¹³

Charts the process as trajectories

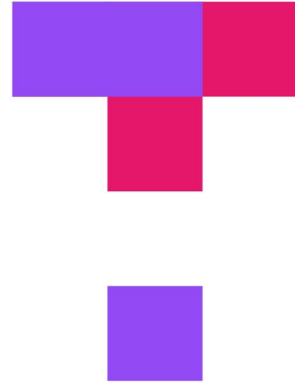


¹³ NN/g: Journey Mapping 101

What did we learn today?

- » Design thinking and process
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Questions?



TOP HAT

What's next?

- >> *Design assignment 1* is released today, due Friday 11:59 pm
- >> *HTML/CSS/Git workshop* today, 5-6 pm, in CS 1221
- >> First Build lecture, *Javascript: An Introduction*, on Thursday