

Building User Interfaces

Design Thinking

from Empathy to Ideas

Professor Bilge Mutlu

What will we learn today?

- >> 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*?

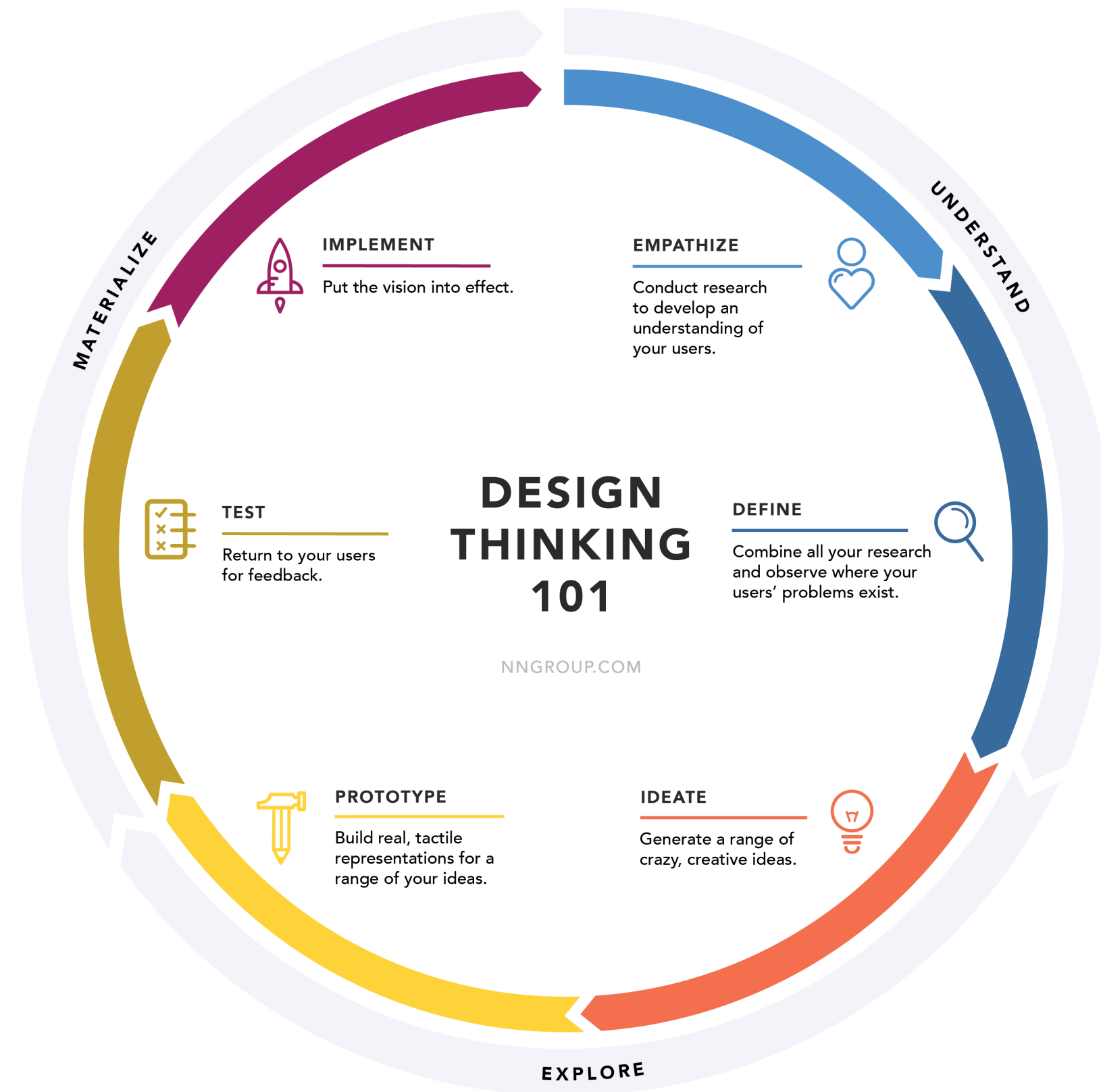
NN/g

**Design Thinking
101**

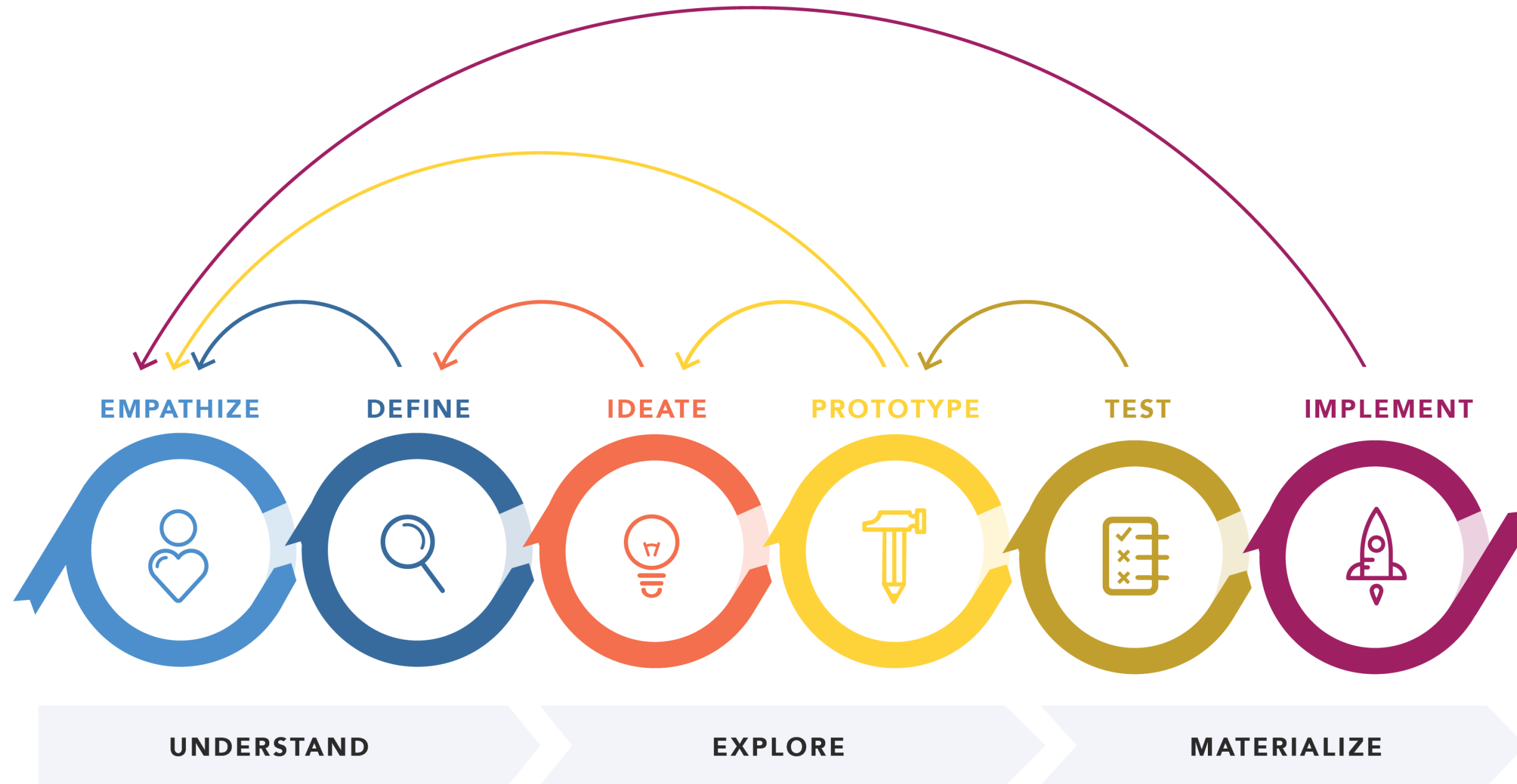
Design thinking has two components:

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



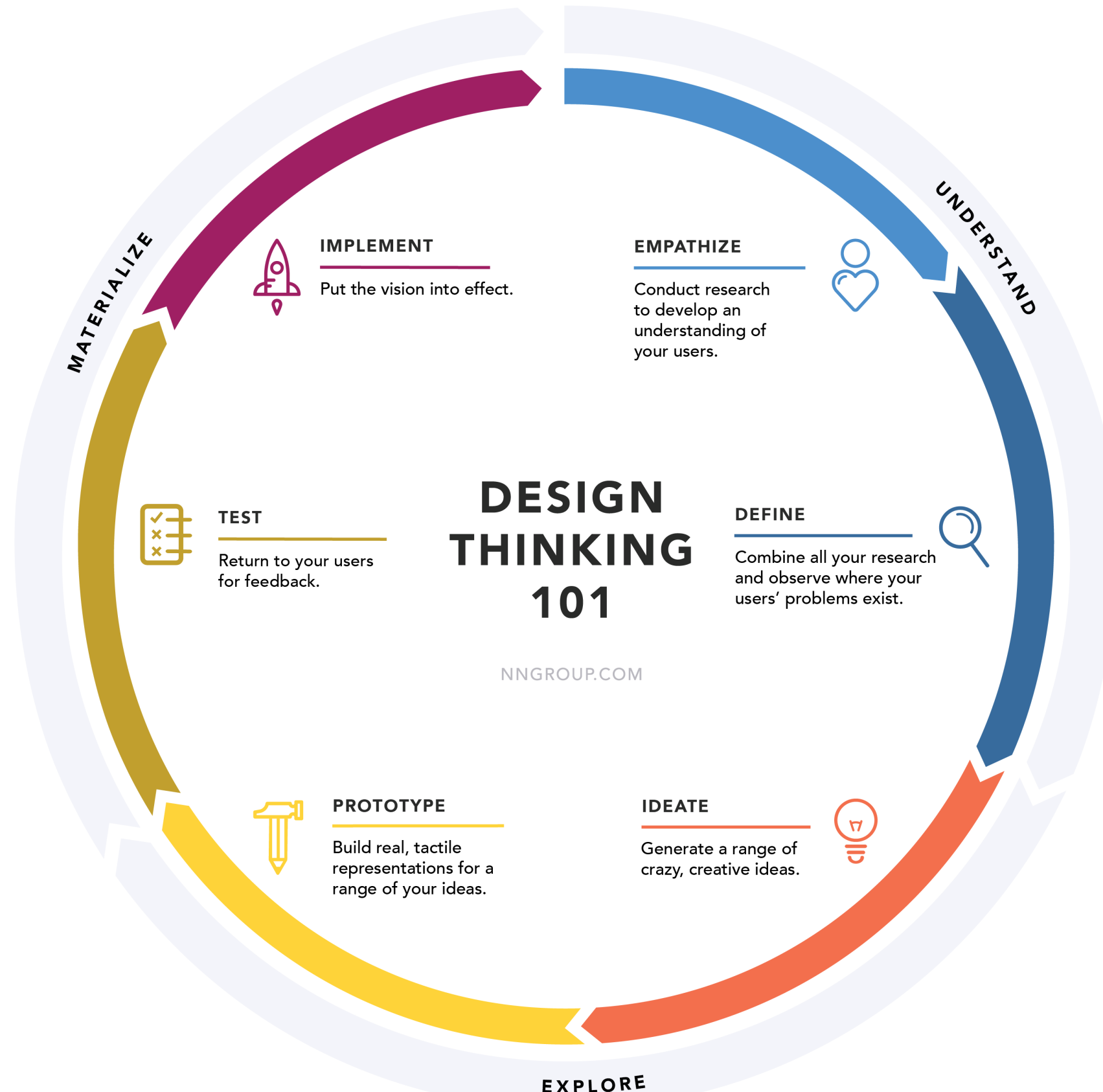
²[NN/g Design Thinking](#)



³NN/g Design Thinking

Takeaways

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



Empathize

(aka User Research)

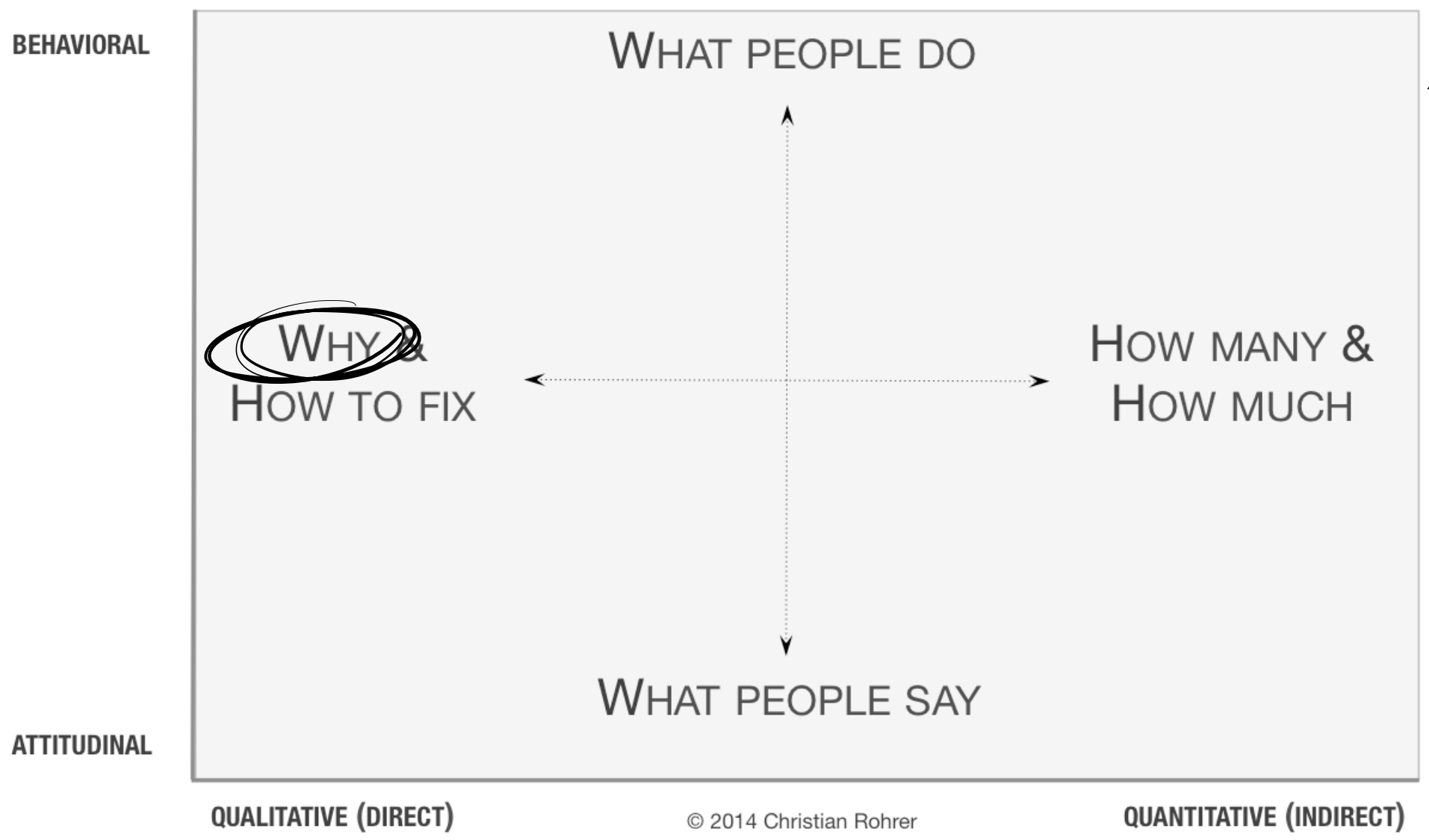
*- needfinding
- customer research*

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.

QUESTIONS ANSWERED BY RESEARCH METHODS ACROSS THE LANDSCAPE



Watching what people do

counting

I really like this

⁴ NN/g UX Research Methods

The simplest and most powerful method for empathy:

Think-alouds

"The #1 Usability Tool" — Jakob Nielsen

Source⁵



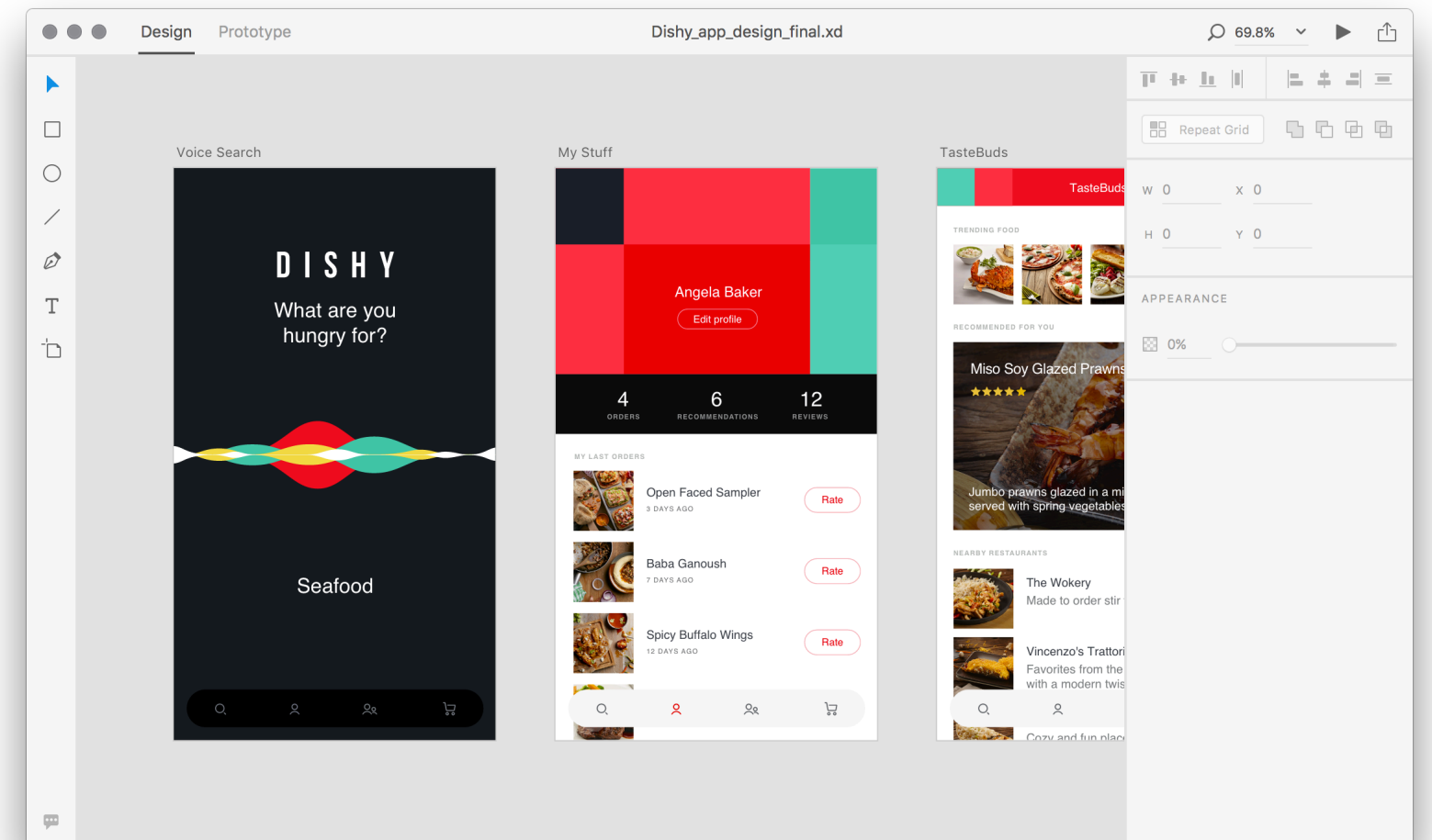
⁵Nomensa

How to conduct a think-aloud

1. Identify representative users *eg. students*
2. Ask users to perform representative tasks
3. Observe and record what they *say* and *do*
4. Analyze your data to develop design insight

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



Seamless

Bad post-it
No explanation or provenance



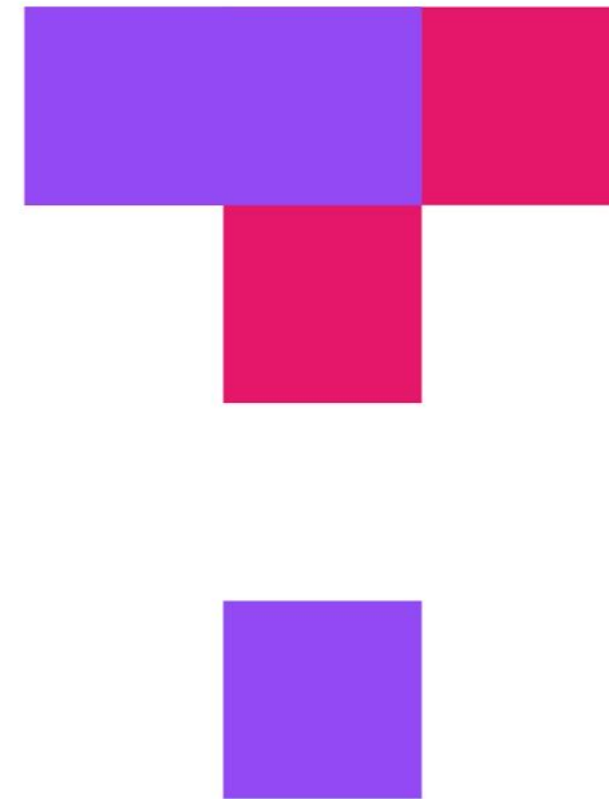
SARAH

Likes to shop with friends but feels much more time pressured

Good post-it
Named and clearly written

⁷Cooper-Wright

TopHat Question



TOP HAT

Adobe XD

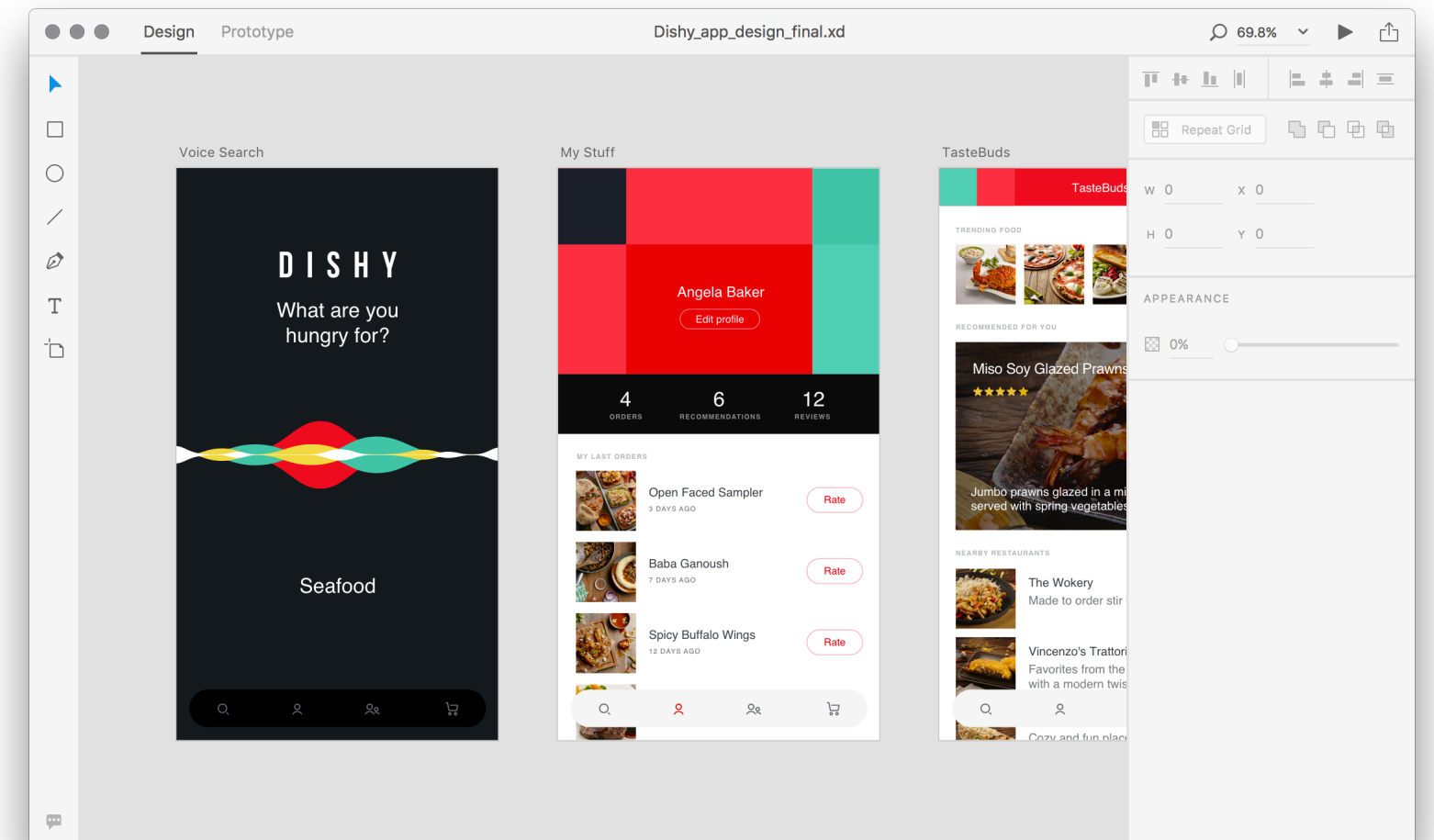
Task 1: Start a new design for the web at size 800 x 600.

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.

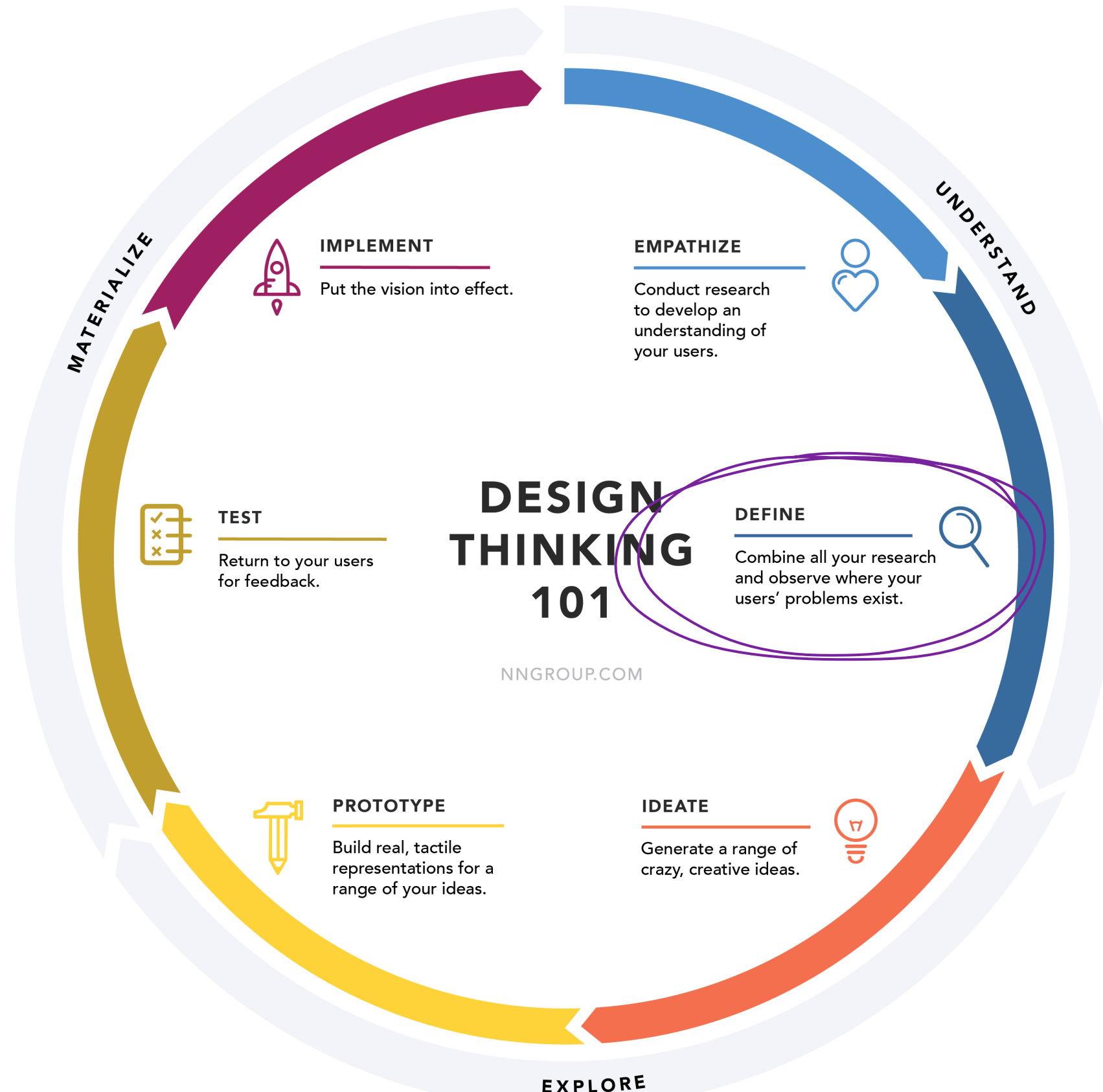
Task 4: Link red button to second canvas and blue button to first.

Task 5: Simulate your design.



More on the TA methods

- >> Can be done *concurrently* or *retrospectively*
- >> Can be applied to pretty much anything
- >> Can be done *before* or *after* design



Define

What does that mean?

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

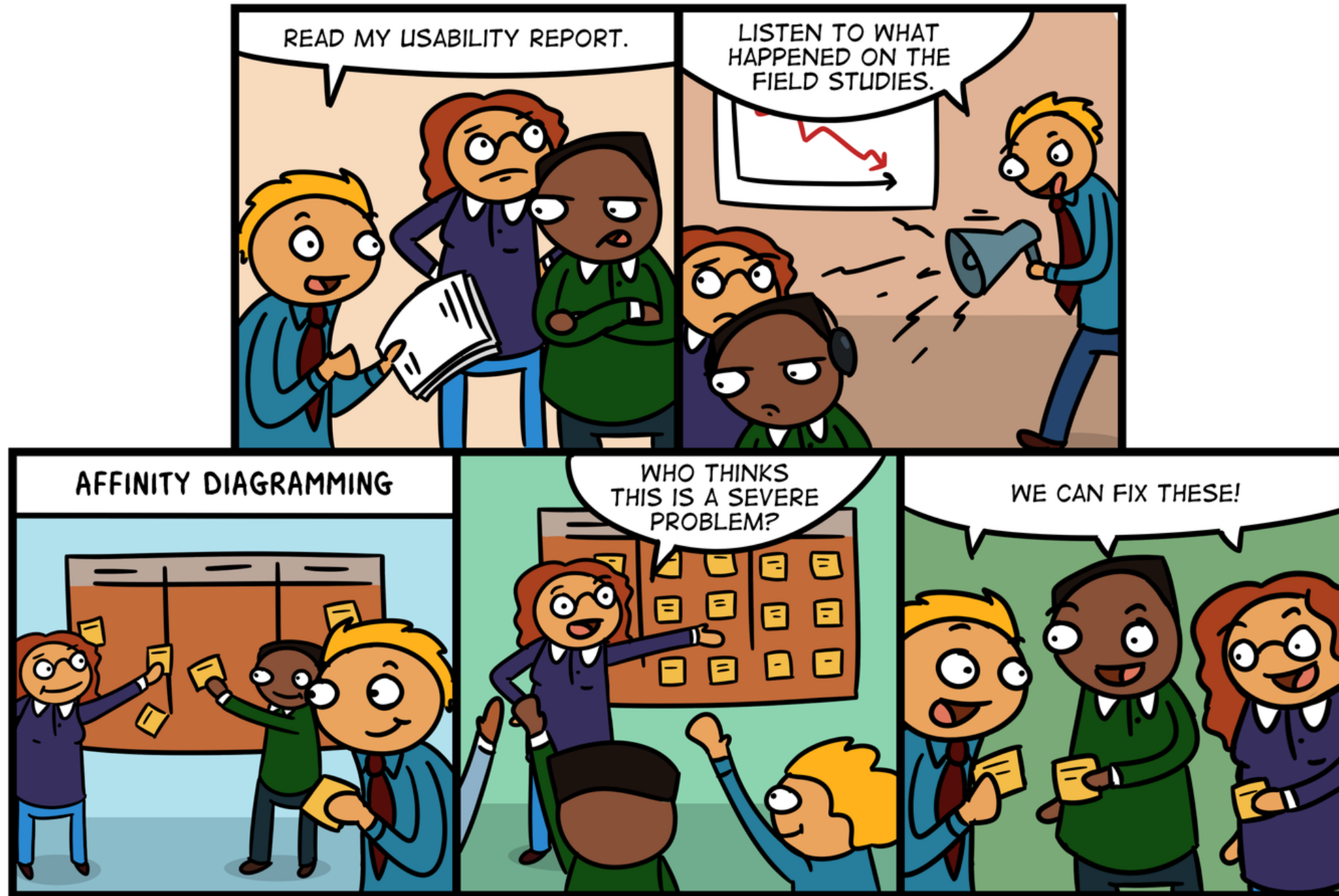
But how do we go about this?

- >> 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.



NN/grou.com NN/g

⁶ NN/g Affinity Diagramming

How do we go about it?

- >> **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 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](#)



I REALLY ENJOY
DONT CALLS,
DONT WANT TO BE
REMOVED FROM
THEM

HAVE
RATS
MAKE
MANDATORY

FOR LYM FIT OUT
BASED ON THE INFO
HE FOUND ON
INTERPRET

INTERLUM + X\$
APPURANCES + X\$
IMAGINE THE COAT

QUOTE:
HIREPOS → EXCEL
↓
EMAIL

I ASK FOR INFO ON
FINISHINGS, MEET
1-1.5 HOURS
(VERY FRUSTRATING)

EVERYTHING IS PER
SQM.
I KNOW HOW MUCH
EVERYTHING IS

ASKS SUPPLIERS
FOR QUOTES BASED
ON THESE HIS
CLIENTS' BUDGETS
(BRIDGE)

LARGER EVENTS
SEND 40-50 PAGES
OF SPECIFICATIONS,
MANUALLY PROCESS

HIREPOS - PICK
ITEMS + COMPLIMENT
+ LABOUR + ...
LIVE BY LINE
PACKAGES

CONTACT OPR
PHONE OR WALK AS
TO OFFICE.

1 CONTRACT/
9/10.
PREFER PRINCE.

BASED ON STEPS,
CALCULATES COST IN
EXCEL SPREADSHEET,
ADDS 15-20% MARGIN
SENDS 1 NUMBER
TO CLIENT

WHEN SEND A QUOTE
ONLY WANT TO SHOW
TOTAL COST,
BREAKDOWN MIGHT
SCARY CUSTOMER

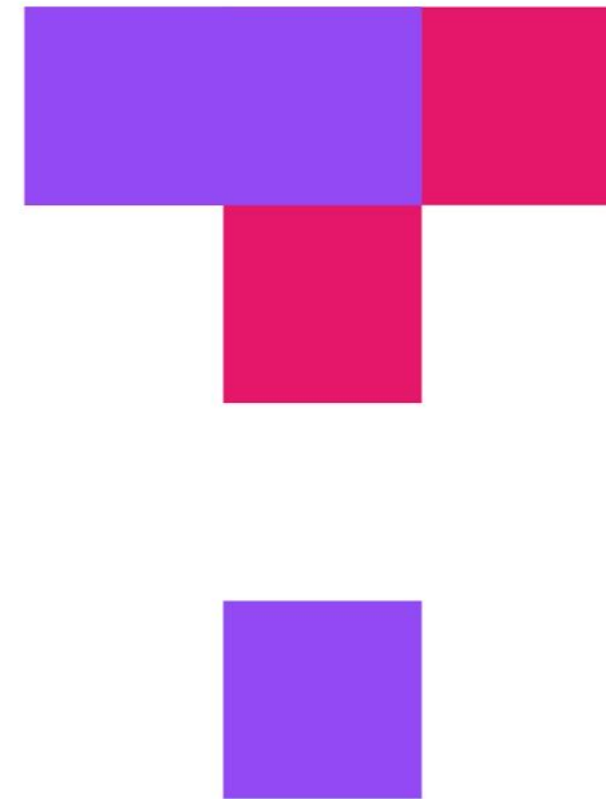
A LOT OF DOUBLING
UP IN OUR
PROCESS

WE ARE HAPPY
WITH WHAT WE
CAN DO
WITH NO
BUDGET

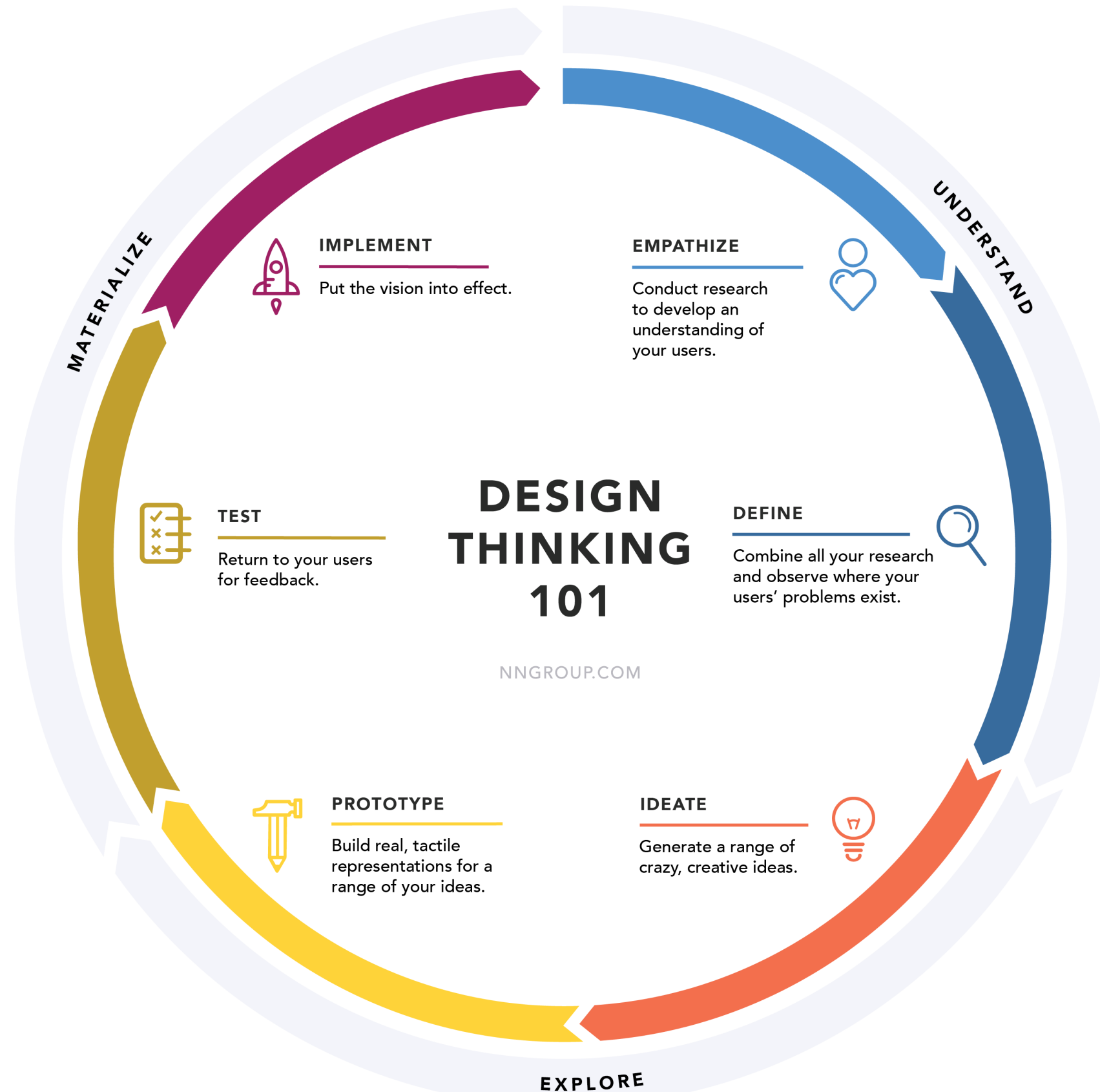
Voilà!

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

Key considerations

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

Source⁸



⁸[GlassDoor](#)

IDEO's Rules of Engagement

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.

Ideation \Leftrightarrow 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

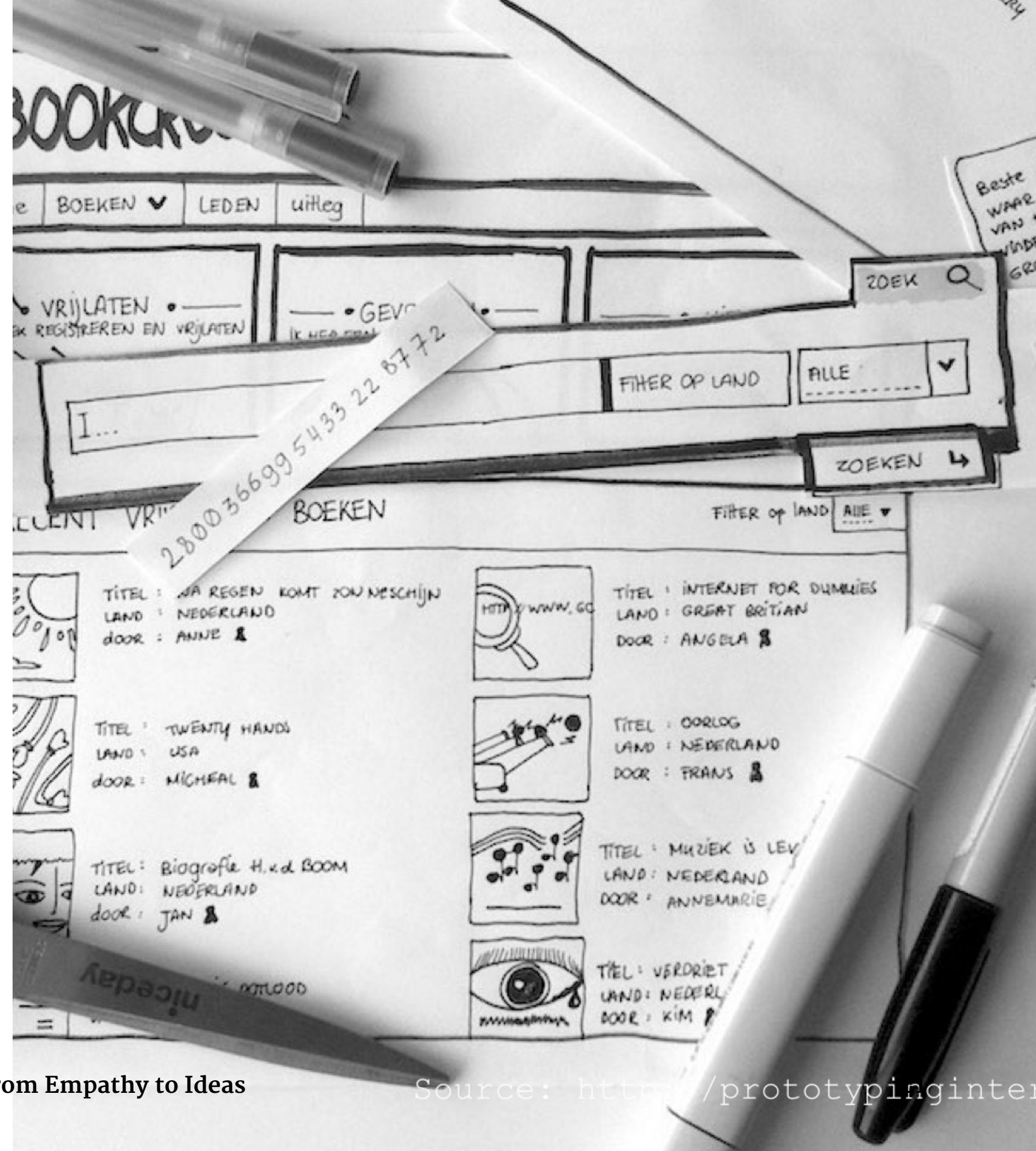
¹⁰Buxton, 2007



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



¹⁰Buxton, 2007

Sketching can do more!¹¹

¹¹Medium

SKETCHING

FOR UX DESIGNERS

TOOLS:
JUST GRAB THE NEAREST
PEN & PAPER!



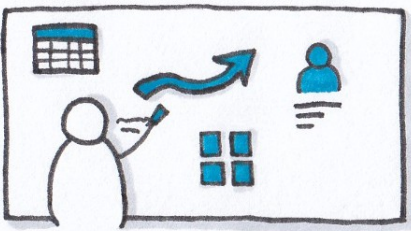
IN CASE OF USER INTERFACES:
VARY THE FIDELITY/
DETAIL LEVEL BASED ON

YOUR GOAL
(DELIVERABLE?
QUICK CONCEPT?)

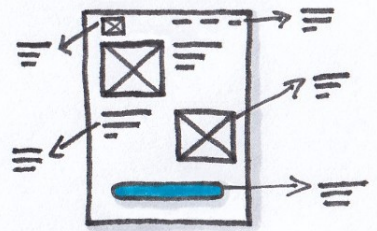
YOUR AUDIENCE
(CLIENT? TEAM?
YOURSELF?)

YOU CAN DRAW,
IT IS NOT ABOUT
BEING ARTISTIC!

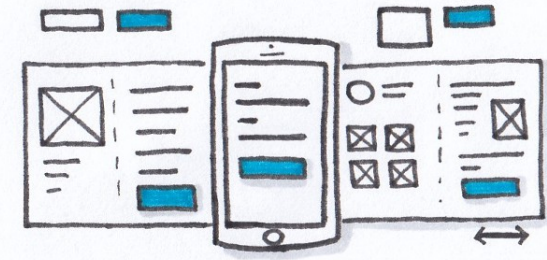
JUST START IT, YOU'LL
BECOME MORE CONFIDENT
OVER TIME!



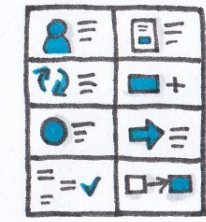
1. FACILITATING MEETINGS &
DESIGN WORKSHOPS,
PROJECT PLANNING



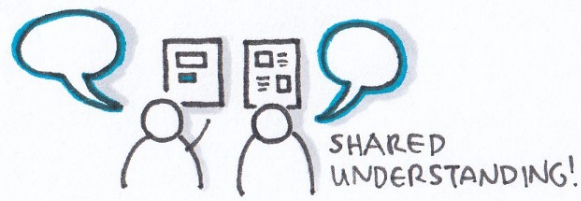
2. WIREFRAMING
DON'T FORGET:
ANNOTATIONS ARE GREAT!



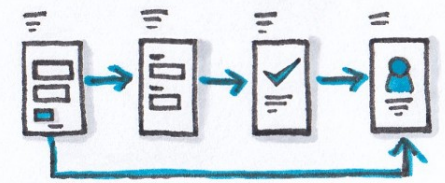
3. PAPER PROTOTYPING -
VALIDATING IDEAS,
TESTING OUT CONCEPTS



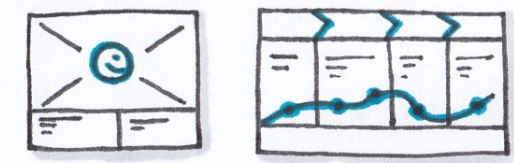
4. IDEATION
QUICK IDEA GENERATION
(E.G. DURING A DESIGN SPRINT,
OR JUST ON YOUR OWN)



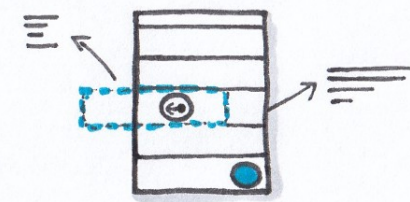
5. TEAMWORK, ANY KIND OF
COLLABORATION
(E.G.: "TALKING SKETCHES")



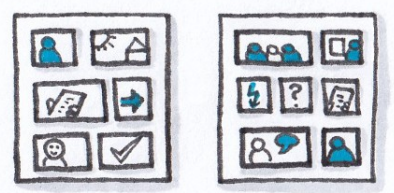
6. USER FLOWS
SITEMAPS
INFORMATION ARCHITECTURE



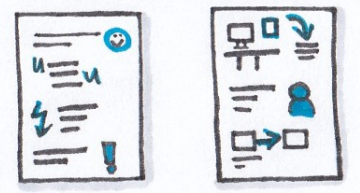
7. MAPPING: EMPATHY MAP,
JOURNEY MAP,
PRODUCT ROADMAP ETC.



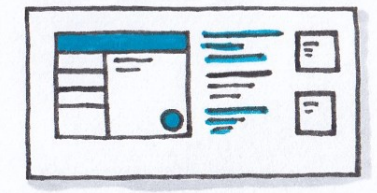
8. UI ANIMATIONS
WHAT CHANGES, HOW,
WHAT THE TRIGGER IS



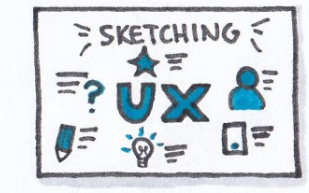
9. STORYBOARDING
VALIDATING
ASSUMPTIONS



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



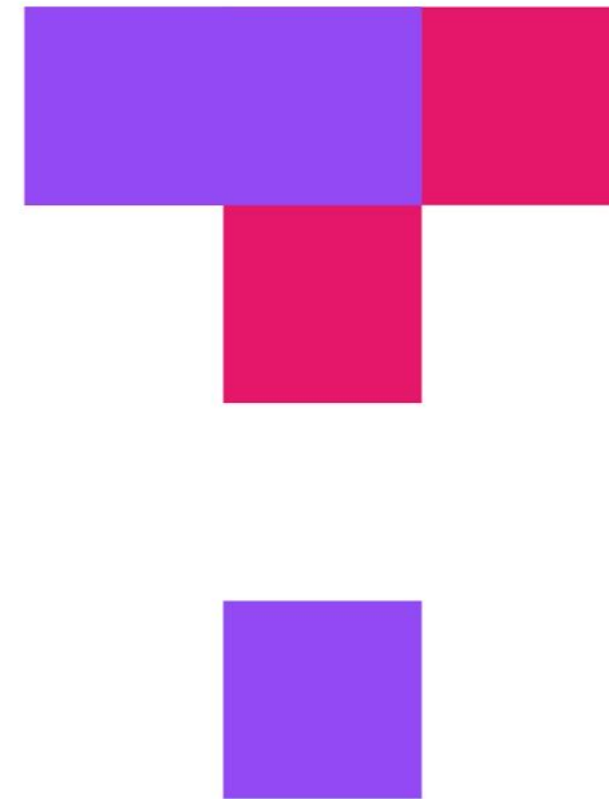
11. DOCUMENTATION,
PRESENTATION
TO CLARIFY &
TO MAKE IT MORE ENGAGING



12. SKETCHNOTING
- CONFERENCE TALKS
- BOOKS
- MEETINGS

CREATED BY KRISTINA SEERONAY
WWW.SKETCHINGFORUX.COM

TopHat Question



TOP HAT

In ideation, sketches illustrate *conceptual designs*.

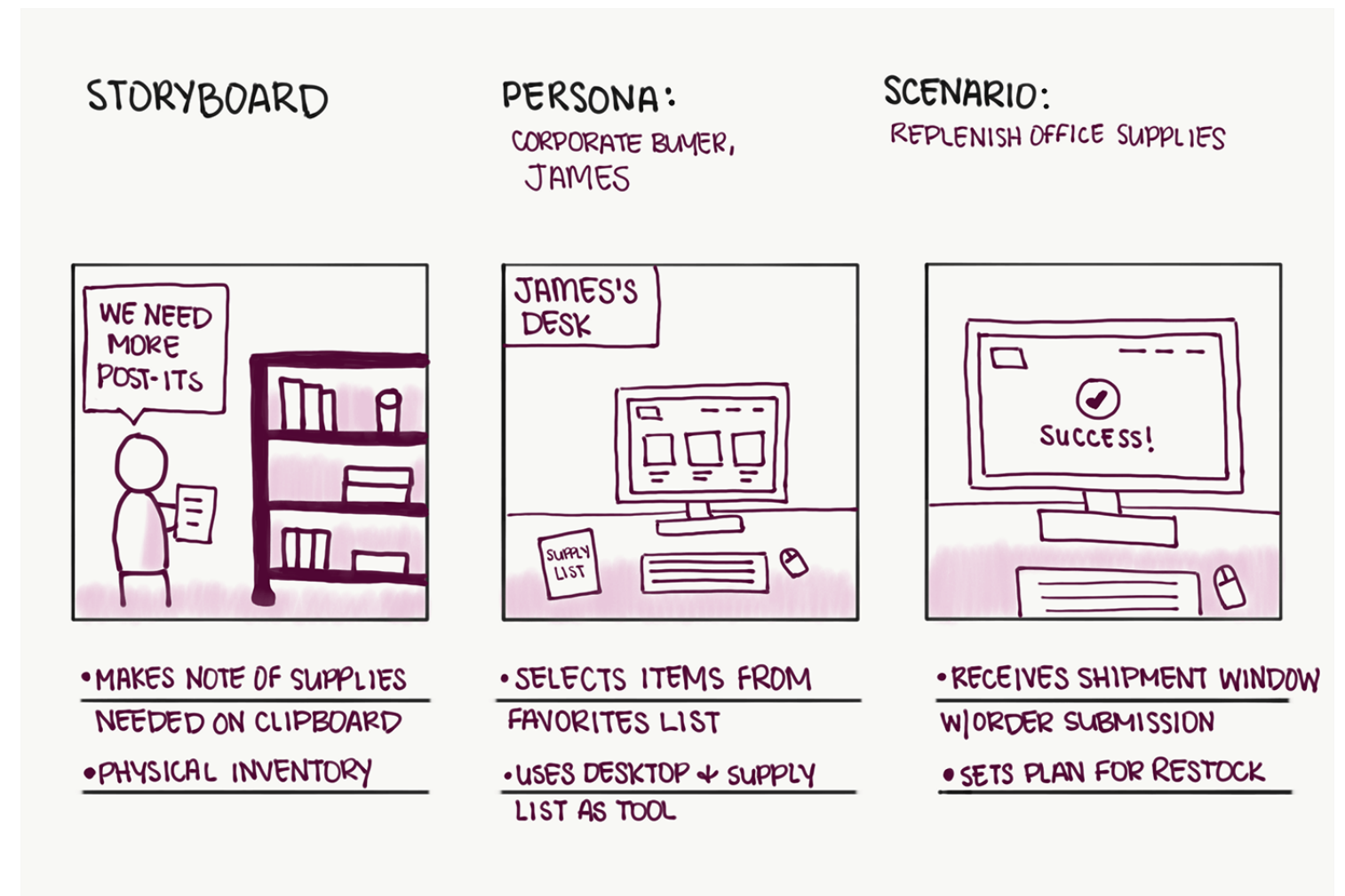
What is Conceptual Design?

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

Storyboarding

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



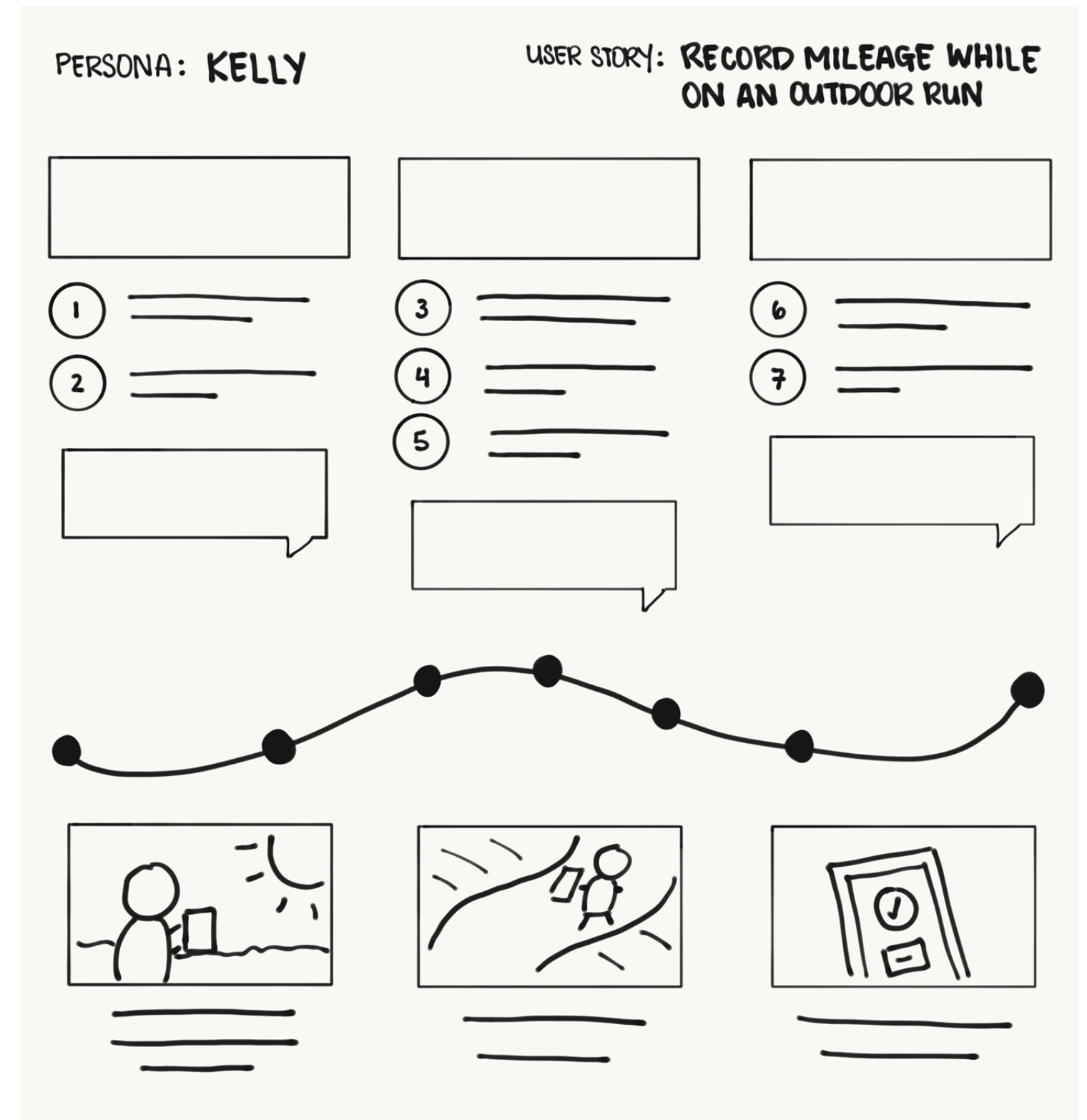
¹² [NN/g: Storyboards Help Visualize UX Ideas](#)

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

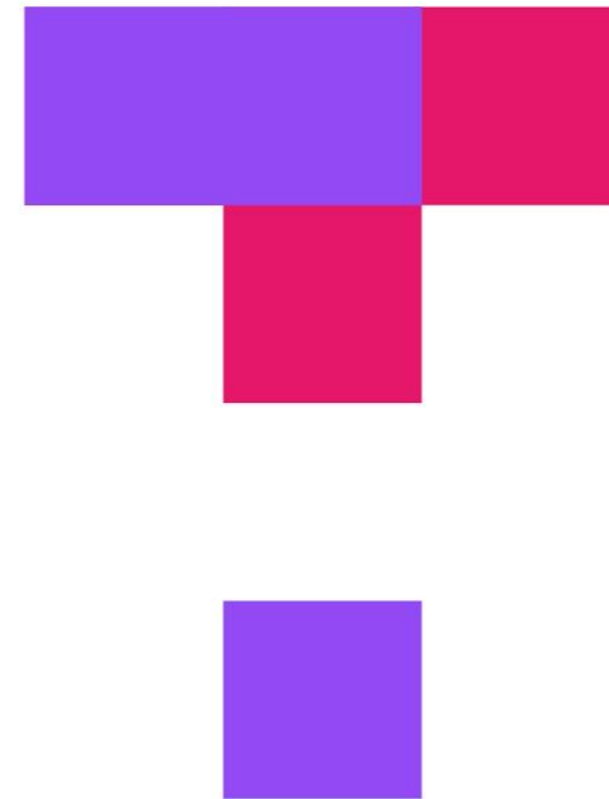


¹³[NN/g: Journey Mapping 101](#)

What did we learn today?

- >> 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

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