

**BME 590: FUNDAMENTALS OF
ENGINEERING DESIGN**

DESIGN EXPERIMENT DISCUSSION

Salinas - Fall 2017



First Step

EMPATHIZE

Finding Meaning





“

Directly witnessing and experiencing aspects of behavior in the real world is a proven way of inspiring and informing [new] ideas. The insights that emerge from careful observation of people's behavior [...] uncover all kinds of opportunities that were not previously evident.

Jane Fulton Suri

EMPATHIZE

- **Observe** user in context of their lives/environment
- **Engage** user through interviews/meetings
- **Immerse** yourself in users environment

What worked?

What didn't?

Your mission: Design a useful and meaningful wallet for your partner

Start by gaining **empathy**

1 Interview

8 min (2 sessions x 4 minutes each)

Notes from your first interview

Switch roles and repeat interview

2 Dig Deeper

6 min (2 sessions x 3 minutes each)

Notes from your second interview

Switch roles and repeat interview

How did it work? (and why?)

Second Step

DEFINE

Creating Actionable Problem Statement





“

If I had an hour to solve a problem and my life depended on the solution, I'd spend the first 55 minutes determining the **proper question to ask**, for once I knew the proper question to ask, I could solve the problem in less than 5 minutes.

Albert Einstein

DEFINE

- **Synthesize** findings from user interview and categorize
- **Understand** user needs and design space
- **Create** actionable statement of project goals

What worked?

What didn't?

Reframe the problem

3 Capture Findings

3 minutes

Goals and Wishes:

What is your partner trying to achieve?

*use verbs

Insights: New learnings about your partner's feelings or motivations. What is something you see about your partner's experience that maybe s/he doesn't see?
*make inferences from what you heard

4 Take a Stand with a point-of-view madlib 3 min



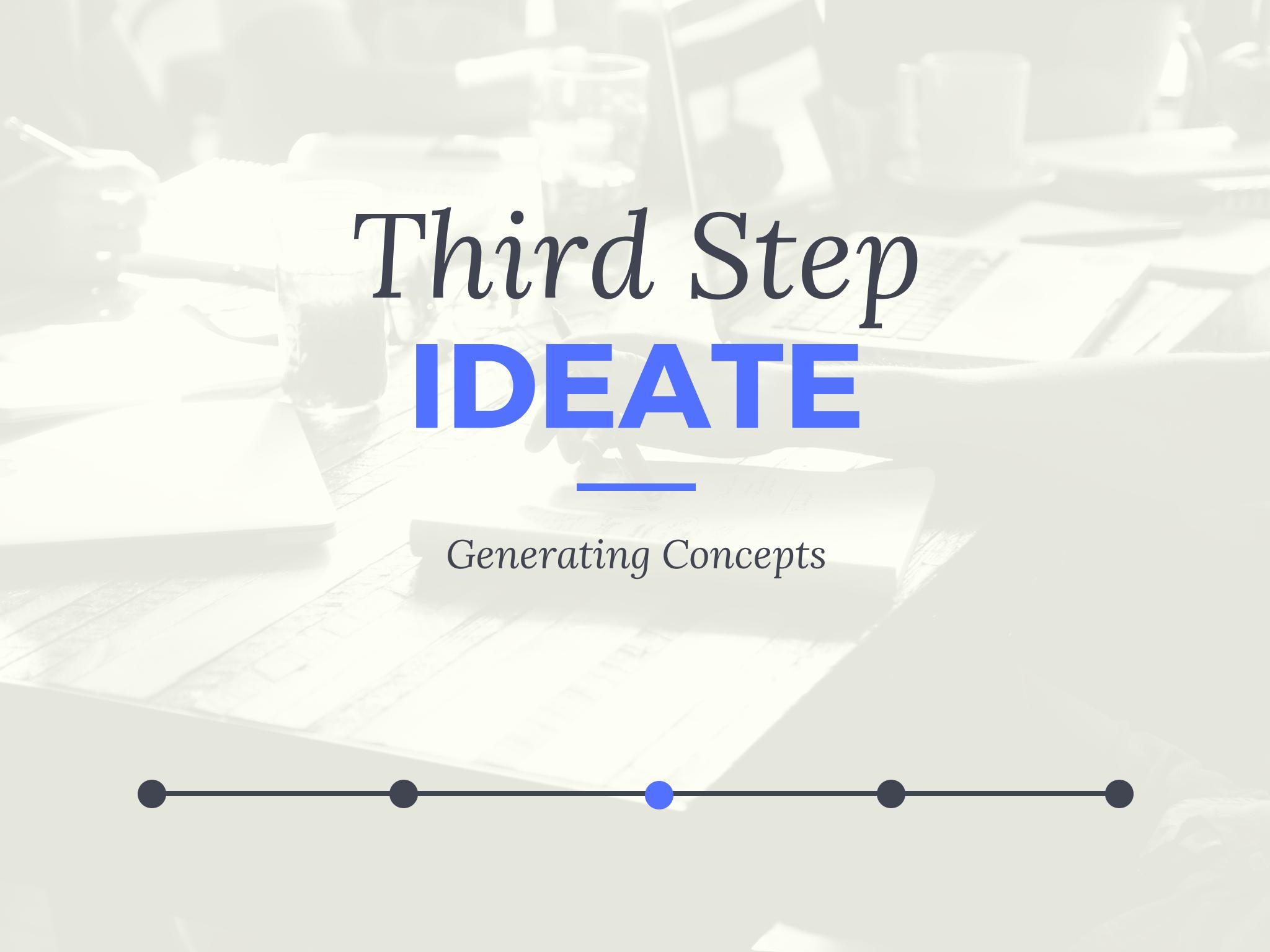
partner's name/description

needs a way to _____

because (or 'but'...or 'interestingly'...) _____

insight

How did it work? (and why?)

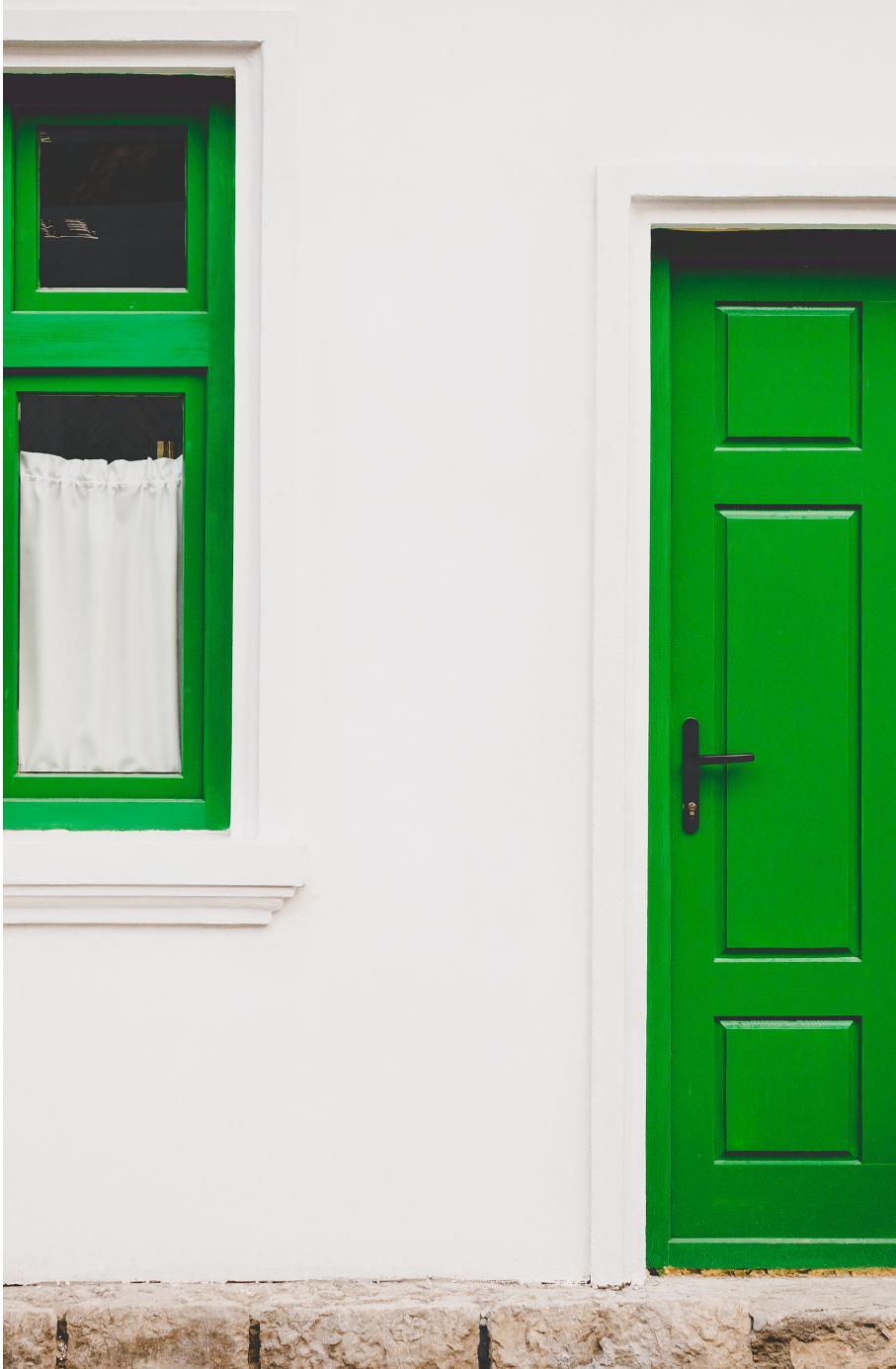


Third Step

IDEATE

Generating Concepts





“
Design has allowed us to
stand out; to look different
and show that difference
boldly.

[Joe Mansueto](#)

IDEATE

- **Generate** creative, radical design alternatives/solutions
- **Gather** wide variety of team/other perspectives
- **Explore** quantity and diversity of solution space

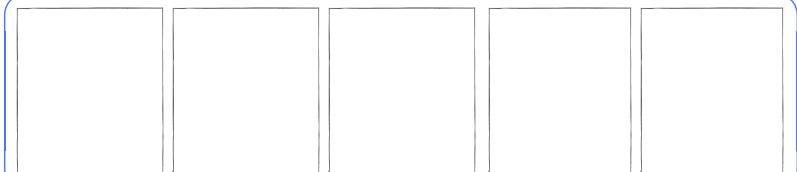
What worked?

Ideate: create multiple alternatives to test

5 Sketch at least 5 super creative ways to meet user's needs

5 minutes

Problem Statement: _____



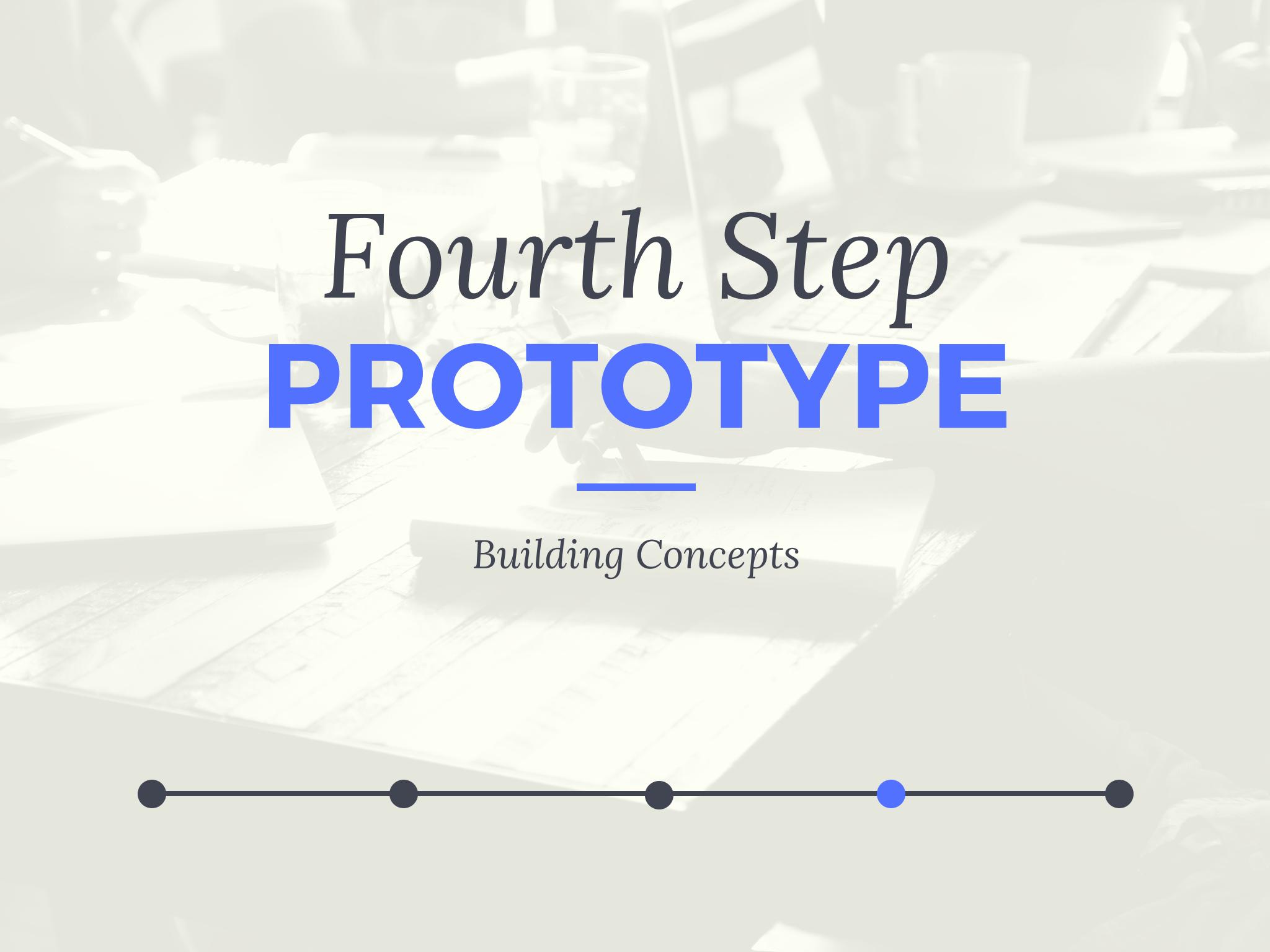
What didn't?

6 Share solutions and capture feedback 10 min (2 sessions x 5 minutes each)

Notes

Switch roles and repeat sharing

How did it work? (and why?)



Fourth Step

PROTOTYPE

Building Concepts



PROTOTYPE



“

The value in a prototype is in the education it gives you, not in the code itself.

Amari Cooper

PROTOTYPE

- *Get physical* getting ideas out of your head and into the world
- *Rapid* prototyping aids in quick evaluation and redefining needs/space
- *Fail* quickly and cheaply

What worked?

What didn't?

Build and Test

8 Build your solution

7 minutes

Make something with which your partner can interact

[Not here]



How did it work? (and why?)

Fifth Step

TEST

Refining





“

Think of the design process as involving first the generation of alternatives and then the testing of these alternatives against a whole array of requirements and restraints.

Herbert Simon



TEST

- **Harness the experience**
investigate how users
interact with prototype (learn
about your user)
- **Inform** prototyping iteration
process
- **Refine** the problem
statement/problem space

What worked?

What didn't?

9 Share solution and get feedback 8 min (2 sessions x 4 minutes each)

⊕ What worked...

⊖ Needs improvement...

❓ Questions...

❗ Ideas...

Switch roles and repeat sharing

How did it work? (and why?)