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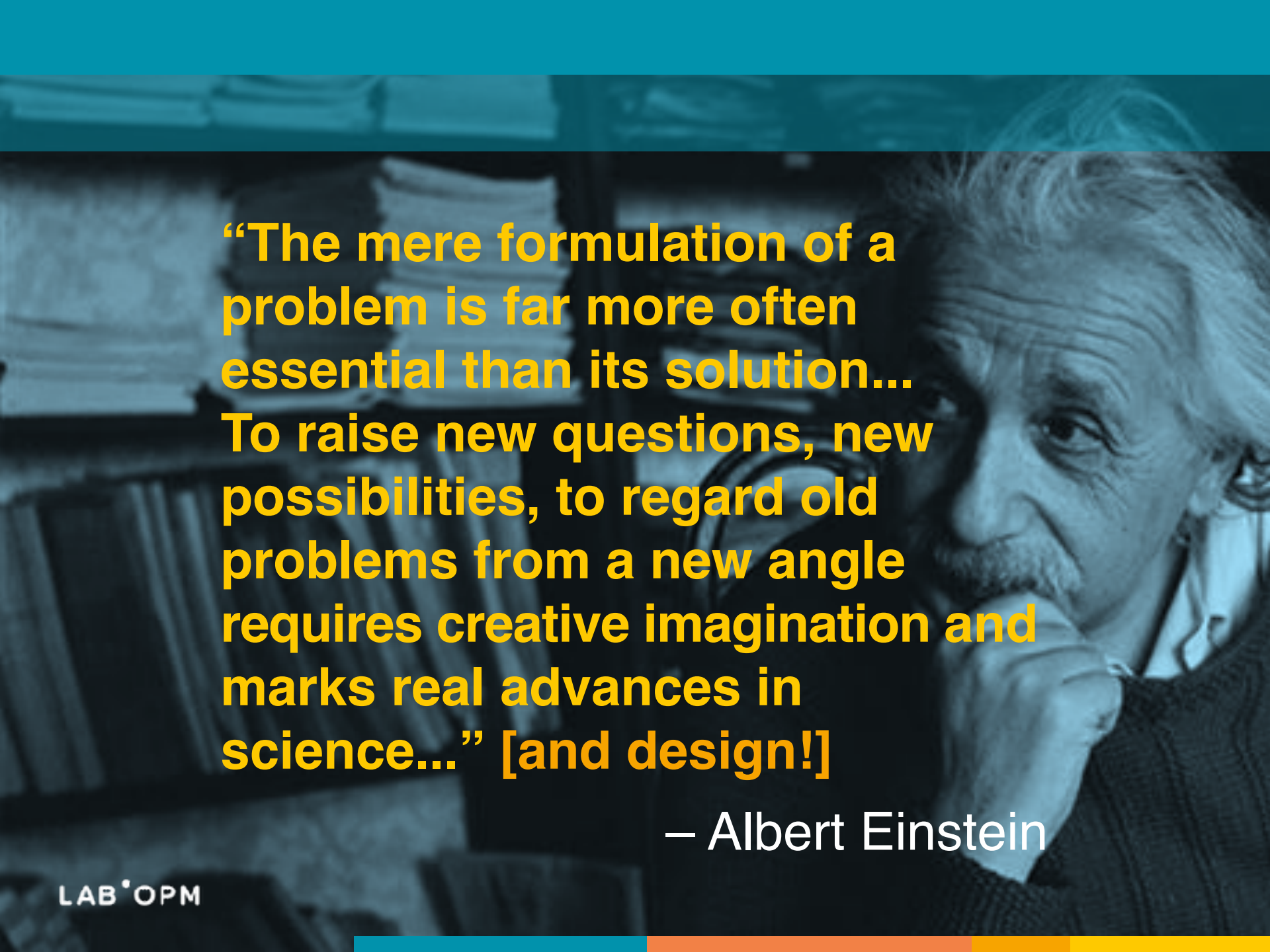
Problem Framing *for* Solution Finding


“The mere formulation of a problem is far more often essential than its solution... To raise new questions, new possibilities, to regard old problems from a new angle requires creative imagination and marks real advances in science...” [and design!]
– Albert Einstein
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What's your problem?!?!
Maybe not what it seems…

This is simply the **MOST IMPORTANT DECISION** decision you'll ever make (in your design projects).

No pressure ☺️

WARM UP! (1 minute)

A palette cleanser problem:

Prompts from the instructors

WARM UP! (1 minute)

A palette cleanser problem:

Design a flower vase.

Design a way to enjoy flowers in your home.

PART 1:
FRAME

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The Power of Problems

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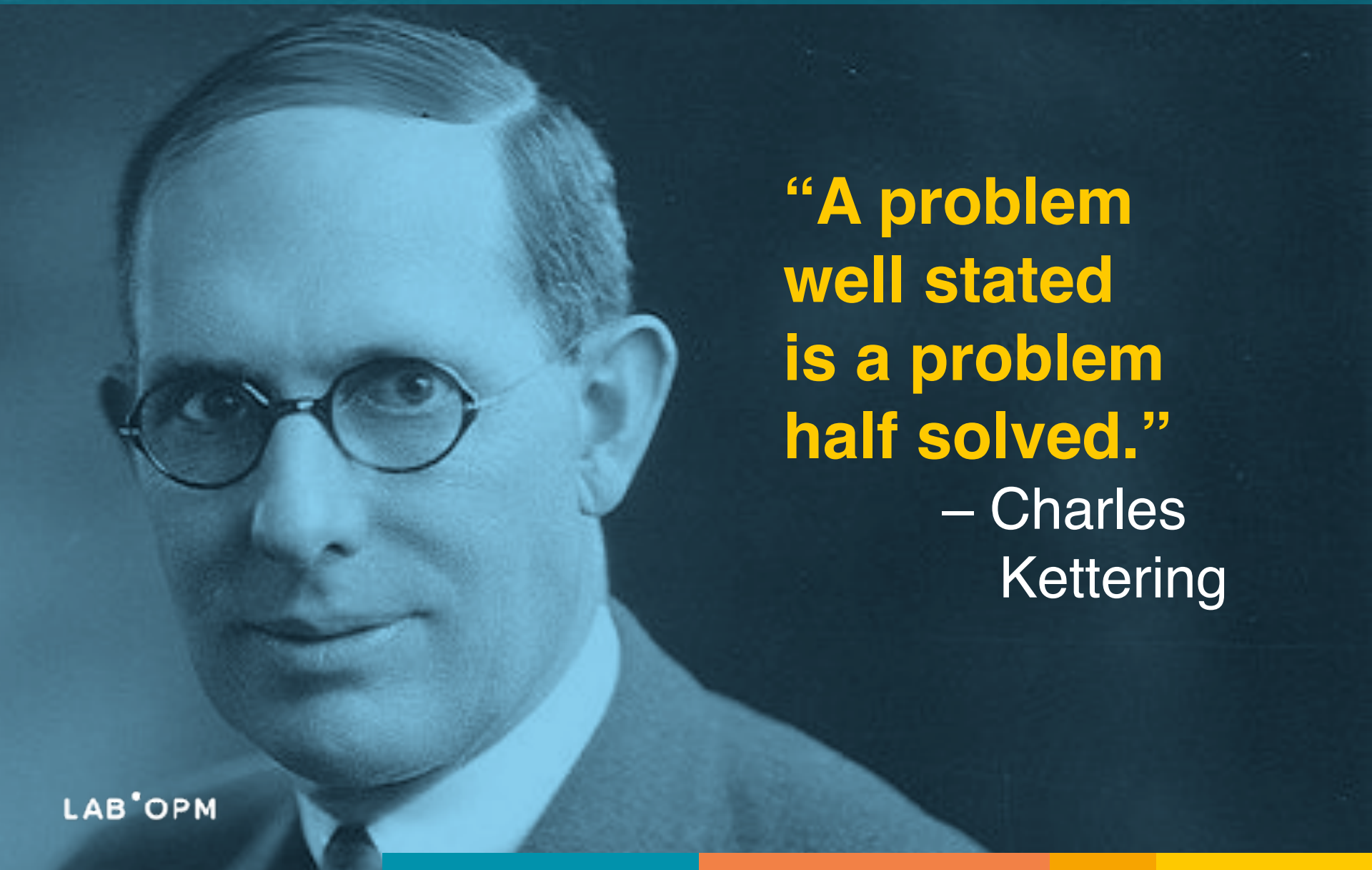
“A problem well stated is a problem half solved.”
– Charles Kettering
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Problem Framing Is Design Opportunity

Framing a design problem or “brief” is often seen as a preliminary, even pro-forma part of developing solutions.

But how we define a problem largely defines its solution, and typically design problems and solutions co-evolve.

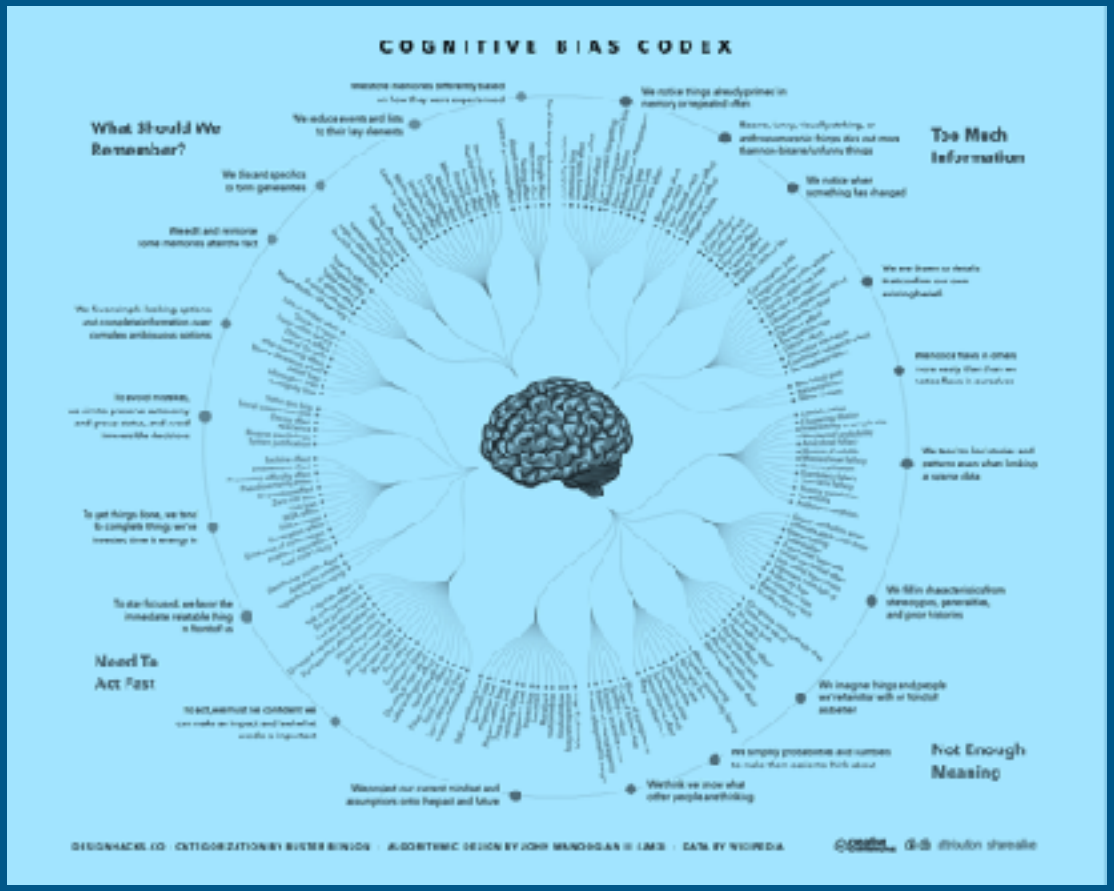
This iterative framing, and reframing of problems is as much a design opportunity as finding solutions.

Problem Framing Is Strategic Advantage

Effective problem framing helps to:

- Avoid wasting resources on solving the wrong problems
- Expand the range of possible solutions to any given problem
- Maximize creative leverage and innovative potential of HCD

Problematic Problem Framing
There are many, many biases



The Cognitive Bias Codex - designhacks.co

Problematic Problem Frames

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Problematic Problem Frames

Shady Characters

1. The Over Eager Beaver
2. The Kid In a Candy Store
3. The Victim of Peer Pressure
4. The Superficial Scaredy-Cat
5. The Super Duper Smarty-Pants

Stephen Anderson – Stop Doing What You're Told –https://www.slideshare.net/stephenpa/stop-doing-what-youre-told/64-requirements_and_user_stories1_Ignore

Problematic Problem Frames

CHARACTER 1:

“Over Eager Beaver”

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Problematic Problem Frame 1

Anchoring

Framing the problem in the context of a specific solution which immediately discounts all other solutions

Ex: *Write some case studies to show how our customers love us!*

Ex: *We need a health game to help employees meet wellness goals.*

Stephen Anderson – Stop Doing What You're Told –https://www.slideshare.net/stephenpa/stop-doing-what-youre-told/64-requirements_and_user_stories1_Ignore

Problematic Problem Frame 2

Solutioneering

Framing the problem in terms of a technology purchase when the issues may not be technical

Ex: *We need a new Drupal CMS to make it easier for our team to edit pages.*

Ex: *Our company needs a Sharepoint installation.*

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Problematic Problem Frame 3

Navel-gazing

Framing the problem in terms of our product's implementation model

Ex: *Users need to be able to search for contacts in the Address Book, then add them to their list of Favorites.*

Real problem:

"I want to speed-dial my husband."

Stephen Anderson – Stop Doing What You're Told –https://www.slideshare.net/stephenpa/stop-doing-what-youre-told/64-requirements_and_user_stories1_Ignore

Problematic Problem Frames

CHARACTER 2:

“Kid In a Candy Store”

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Problematic Problem Frame 4

Wishlisting

Framing the problem as a set of desired features, which users may or may not actually need, want, or care about

Ex: *We need our new site to be able to do this, that, and the other thing…*

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Problematic Problem Frame 5

Buzzwording

Likening the solution to some other popular product or service

Ex: *We're going to be the iTunes of health insurance!*

Ex: *This will be the Angry Birds of online shopping!*

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Problematic Problem Frame 6

Frankensteining

Framing the problem as a blend of things that may or may not mix

Ex: *A tool for students to log into the computer lab but also for teachers to sift through student data*

Ex: *YouTube meets Friendster meets Tribe meets Craigslist…*

Stephen Anderson – Stop Doing What You're Told –https://www.slideshare.net/stephenpa/stop-doing-what-youre-told/64-requirements_and_user_stories1_Ignore

Problematic Problem Frames

CHARACTER 3:

“Victim of Peer Pressure”

Problematic Problem Frame 13

Amplifying the Feedback

Allowing the complaints (or praise) of a few people to drive decisions, even when statistically insignificant

Ex: *We must fix this now! I've got several customers complaining about our new changes.*

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Problematic Problem Frame 12

Ego Stroking

Problem exists because it's important to the HiPPO (Highest Paid Person's Opinion)

Ex: *[Insert whatever name you like—the HiPPO asked for it…]*

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Stephen Anderson – Stop Doing What You're Told –https://www.slideshare.net/stephenpa/stop-doing-what-youre-told/64-requirements_and_user_stories1_Ignore

Problematic Problem Frame 9

Bandwagoning

Framing the problem as something important to do because everyone else seems to be doing it

---

Ex: *We need a Facebook page!*

Ex: *We need a blog!*

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Stephen Anderson – Stop Doing What You're Told –https://www.slideshare.net/stephenpa/stop-doing-what-youre-told/64-requirements_and_user_stories1_Ignore

Problematic Problem Frames

CHARACTER 4:

“Superficial Scaredy-Cat”

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Problematic Problem Frame 14

Treating a Symptom

Reacting to urgent problems rather than seeking the reason for that problem

Ex: *We need more customer support folks to answer all these incoming calls!*

Stephen Anderson – Stop Doing What You're Told –https://www.slideshare.net/stephenpa/stop-doing-what-youre-told/64-requirements_and_user_stories1_Ignore

Problematic Problem Frame 15

Catastrophizing

Solving non-problems by anticipating massive negative consequences for circumstances that don't yet exist.

Ex: *We're going to be overwhelmed by customer contact if we add more features. We need to introduce live chat capability, an online support community, and live tutorials NOW, in anticipation.*

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Stephen Anderson – Stop Doing What You're Told –https://www.slideshare.net/stephenpa/stop-doing-what-youre-told/64-requirements_and_user_stories1_Ignore

Problematic Problem Frame 16

Hamstringing

Artificially constraining the problem with assumed limitations (usually tech, user, or political)

Ex: *Our technology doesn't allow us to…*

Ex: *The senior VP will never go for that.*

Ex: *We've tried that before.*

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Stephen Anderson – Stop Doing What You're Told –https://www.slideshare.net/stephenpa/stop-doing-what-youre-told/64-requirements_and_user_stories1_Ignore

Problematic Problem Frames

CHARACTER 5:

“Super Duper Smarty Pants”

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Problematic Problem Frame 19

Overlooking the Obvious

Problem as presented is missing a vital piece of information or based on flawed assumptions

Ex: *Would you like the economy ticket or the premium? (vs. Would you like to upgrade?)*

Stephen Anderson – Stop Doing What You're Told –https://www.slideshare.net/stephenpa/stop-doing-what-youre-told/64-requirements_and_user_stories1_Ignore

Problematic Problem Frame 20

Suspending Reality

Believing the problem has not already been solved

Ex: *We're building THE community for the parents of kids with Type-1 diabetes! (Except that this already exists.)*

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Exercise 1.2 (10 minutes)

Remedy + Reconstruct

1.2.1: Find a partner and diagnose issues with each other's problem statements, just like you did for the example problems.

1.2.2: Based on your partner's feedback, refine and rewrite you problem statement.

Eager Beaver:

1. *Anchoring*
2. *Solutioneering*
3. *Navel-gazing*

Here's even more: *http://bit.ly/badproblems*

Candy Store:

4. *Wishlisting*
5. *Buzzwording*
6. *Frankensteining*
7. *Flavoring*
8. *Boiling the Ocean*

Peer Pressure:

9. *Bandwagoning*
10. *Following the Leader*
11. *Pacifying [Person]*
12. *Ego Stroking*
13. *Amplifying Feedback*

Scaredy-Cat:

14. *Treating Symptoms*
15. *Catastrophizing*
16. *Hamstringing*
17. *Satisficing*

Smarty Pants:

18. *Being Presumptuous*
19. *Overlooking the Obvious*
20. *Suspending Reality*
21. *Future Proofing*

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Contextualizing Challenges

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Contextualizing Challenges
Getting the Lay of the Land

Problems don’t exist in a vacuum. They’re comprised of and surrounded by people, places, systems, forces, and constraints that mustn't be overlooked in their framing.

Before trying solve a problem, be sure to have a look around, ask some important questions, and try to understand who and what you’re really dealing with.

Contextualizing Challenges
Do Diligent Discovery Work

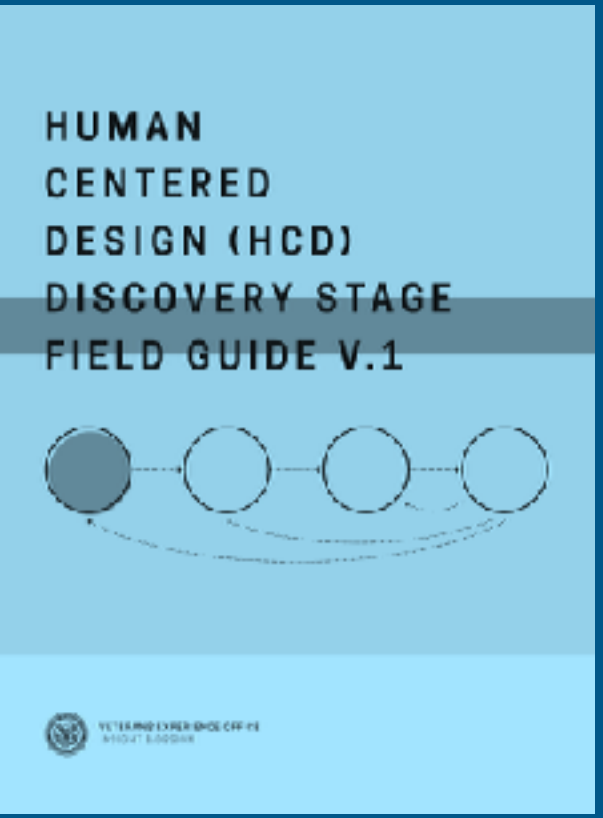
Framing doesn't end when discovery begins. It's important to include some research in your problem framing process in order to evaluate and explore some key questions:

How do we know this is a real problem? Who cares? Why now? Where at? Are there any constraints? What is the root cause?

Here's a few strategies for finding answers…

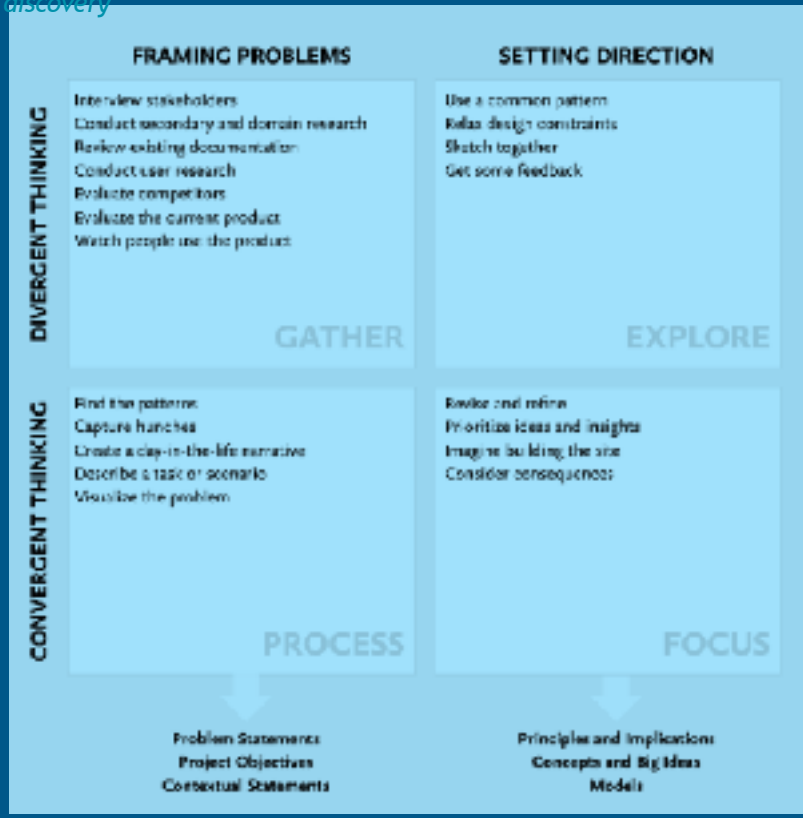
Contextualizing Challenges
Lots of Resources Out There

The Lab at OPM – lab.opm.gov



18F – https://methods.18f.gov/discover/

Dan Brown – *https://abookapart.com/products/practical-design-discovery*



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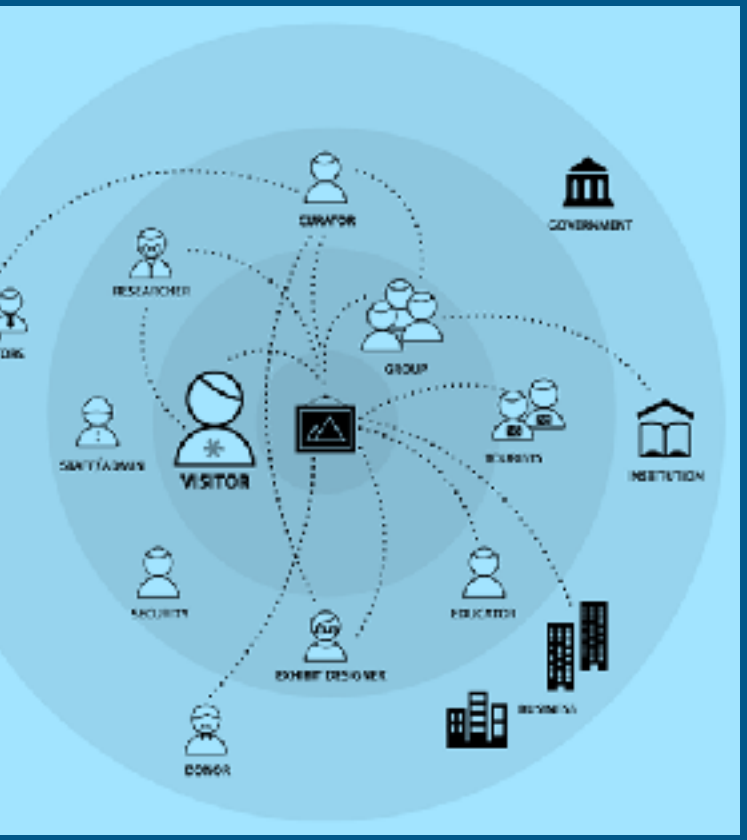
Contextualizing Challenges

Stakeholder Maps



A big part of solving most complex problems, is satisfying the needs and interests of everyone involved. Visualize them before your start.

Ex: Some Common Types…

1. Proximity Map
2. Bubble Diagram
3. Relationship Map
4. Flow Chart
5. Alignment Matrix
6. Service Blueprint
7. User Segments
8. Hybrids of these ↑

Patrick Sirois – Stakeholder Mapping as a Springboard – https://blog.triode.ca/2015/02/11/stakeholder-mapping-as-a-springboard-to-innovation/

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Contextualizing Challenges

The Four "W"s

Who… Are the primary and secondary stakeholders here?	**What…** Are their immediate and deeper needs or expectations?
Where… Do they encounter this problem or need of theirs?	**When…** Do they need the solution or support you are designing?

Exercise 2.1 (10 minutes)

Who? What? Where? When?

2.1.1: Using the frameworks just presented, visualize important aspects of your problem:

- *Who are the key stakeholders involved?*
- *What constraints should be considered?*
- *Where and when is it in time and space?*

2.1.2: Share your problem diagram with someone at your table, and together, discuss what would happen if things were different:

- *What if a few stakeholders trade places?*
- *What if a policy or system is swapped out?*
- *What if there was more/less time/space?*

Contextualizing Challenges

The Five Whys

Taiichi Ono – Toyota
– Ask 'why' five times…

Another waste of time and energy is only treating symptoms rather than addressing the root cause of a problem. Always ask why (x5)!

Ex: Welding robot has stopped?

1. **"Why did the robot stop?"** Overloaded circuit.
2. **"Why did the circuit overload?"** Insufficient lubricant.
3. **"Why insufficient lubricant?"** Ineffective oil pump.
4. **"Why is the ineffective pump?"** Intake is clogged.

Exercise 2.2 (10 minutes)
Why? Why? Why? Why? Why?

2.2.1: Ask "*why*" is your problem really a problem? Answer as best you can, then ask the same question of your answer—5 times.

If your problem already feels very basic or broad, swap in the question *"how"* for *"why."*

Articulating Opportunities

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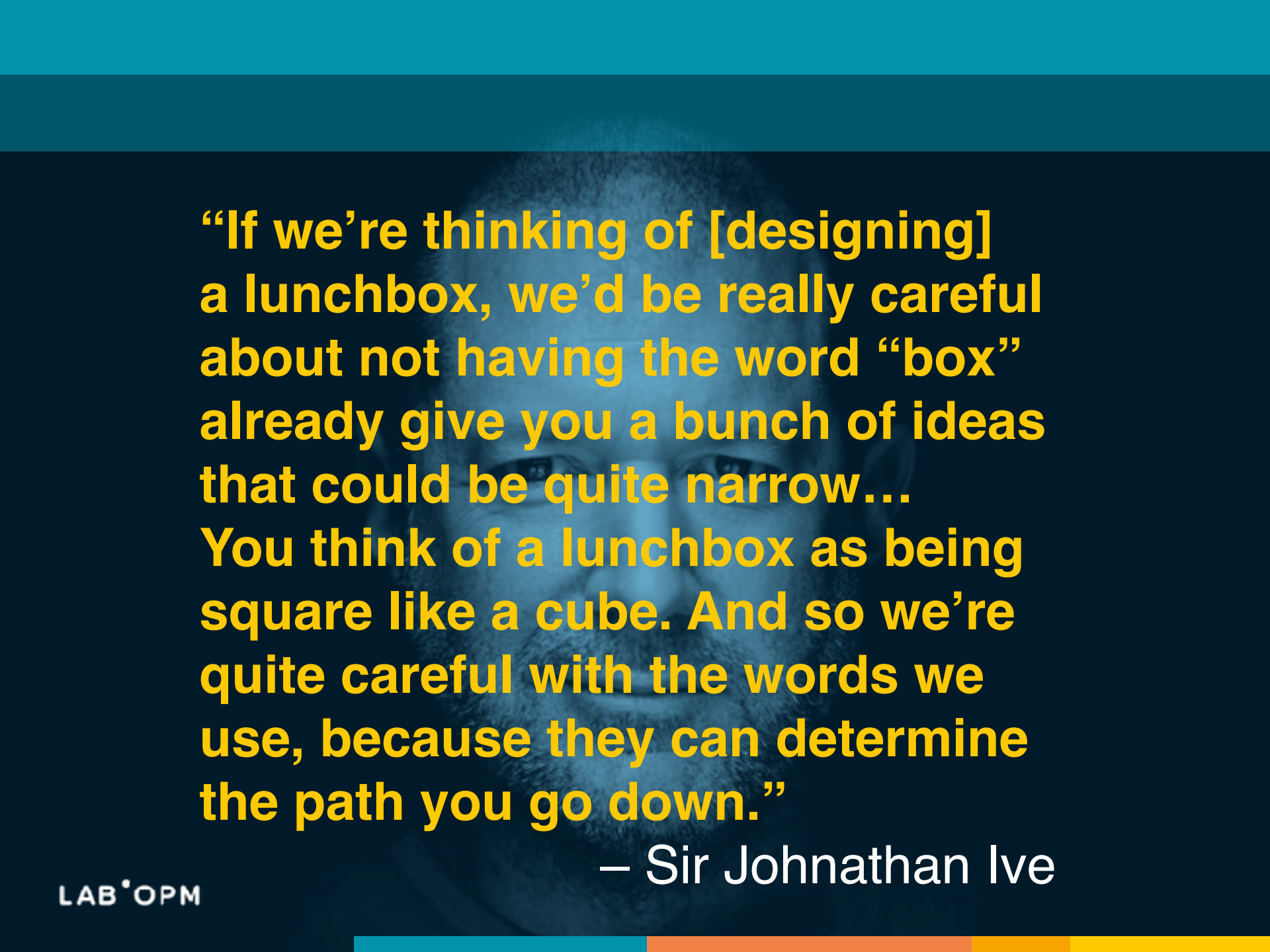
“If we’re thinking of [designing] a lunchbox, we’d be really careful about not having the word “box” already give you a bunch of ideas that could be quite narrow…
You think of a lunchbox as being square like a cube. And so we’re quite careful with the words we use, because they can determine the path you go down.”
– Sir Johnathan Ive
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Articulating Opportunities
The Poetry of a Good Problem

How you articulate your problem will influence how you approach it, so it's important to try to find the right words.

Stating your problem in the best possible terms takes creativity and critical thinking. Here are some distinctions and strategies that will help set you up well for design.

Articulating Opportunities Means Shifting Perspective

FROM		TO
A generic user group & narrow solution space	→	A specific user group & broad solution space
Business interest	→	Human interest
Outputs & activities	→	Outcomes & value
Products	→	Experiences
Prescriptive	→	Generative
Clinical, prudent & set in stone	→	Optimistic, provocative & always in beta

Articulating Opportunities
Why Not Start with a Question?

Just three little words:

How might we…?

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Articulating Opportunities
Why Not Start with a Question?

Just three little words:

How might we…?

Action/goal oriented

Articulating Opportunities
Why Not Start with a Question?

Just three little words:

How might we…?

Action/goal oriented

Open-ended potential

Articulating Opportunities
Why Not Start with a Question?

Just three little words:

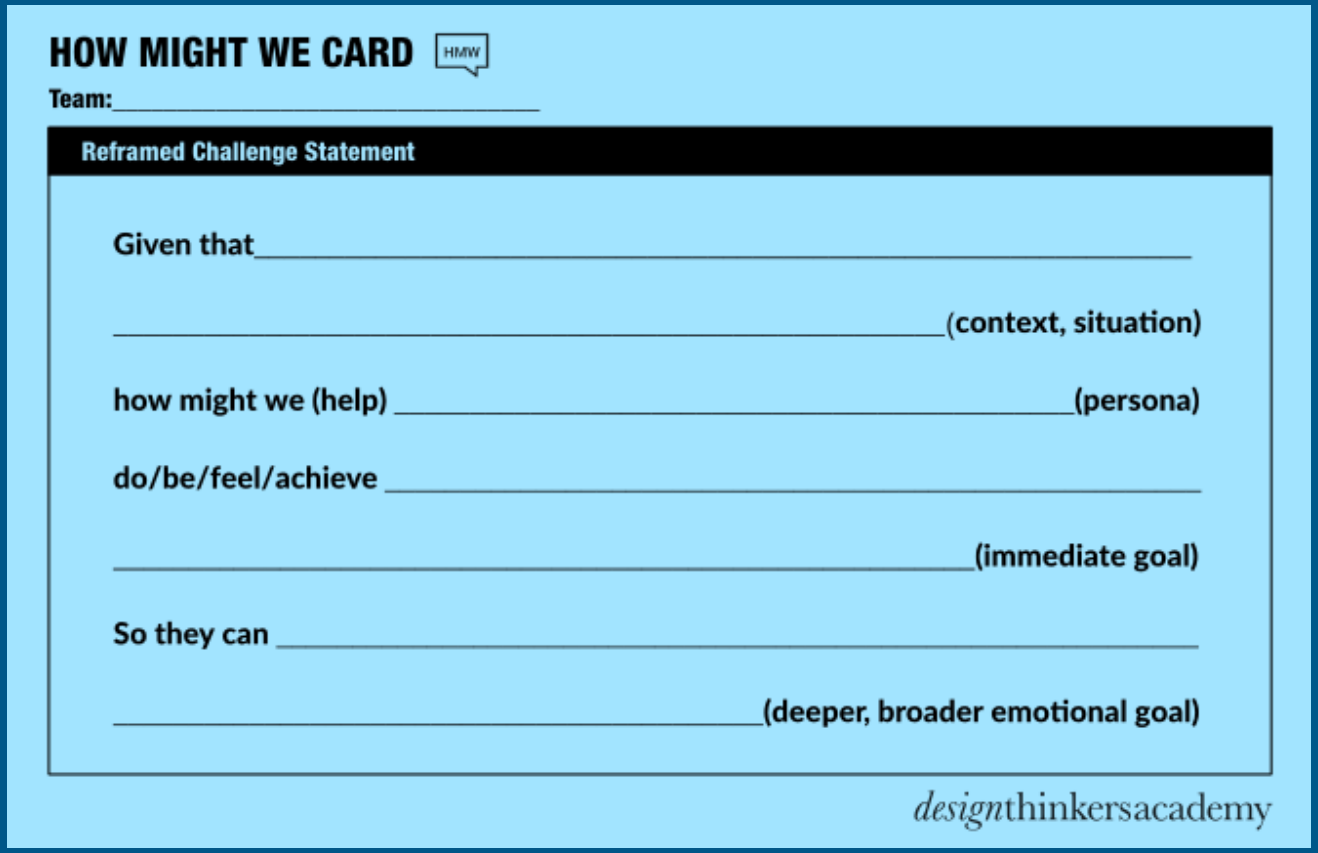
How might we…?

Action/goal oriented

Open-ended potential

Collaborative & inviting

Articulating Opportunities
Why Not Start with a Madlib?



HOW MIGHT WE CARD HMW

Team:_____

Reframed Challenge Statement

Given that_____

_____**(context, situation)**

how might we (help) _____**(persona)**

do/be/feel/achieve _____

_____**(immediate goal)**

So they can _____

_____**(deeper, broader emotional goal)**

*design*thinkersacademy

Marc Bolick – *Framing The Challenge* – The Lab at OPM's Spring Design School 2018

Innovation Reframeworks

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Powerful Frames & Classic Reframes…

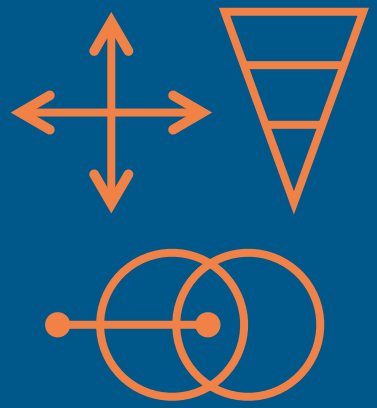
What is 5 plus 5? What two numbers add up to 10?

Faster horses? Better cars? Or mobility alternatives?

Time flies like an arrow. Fruit flies like a banana. ☺️

Generative Reframeworks Explore New Points of View

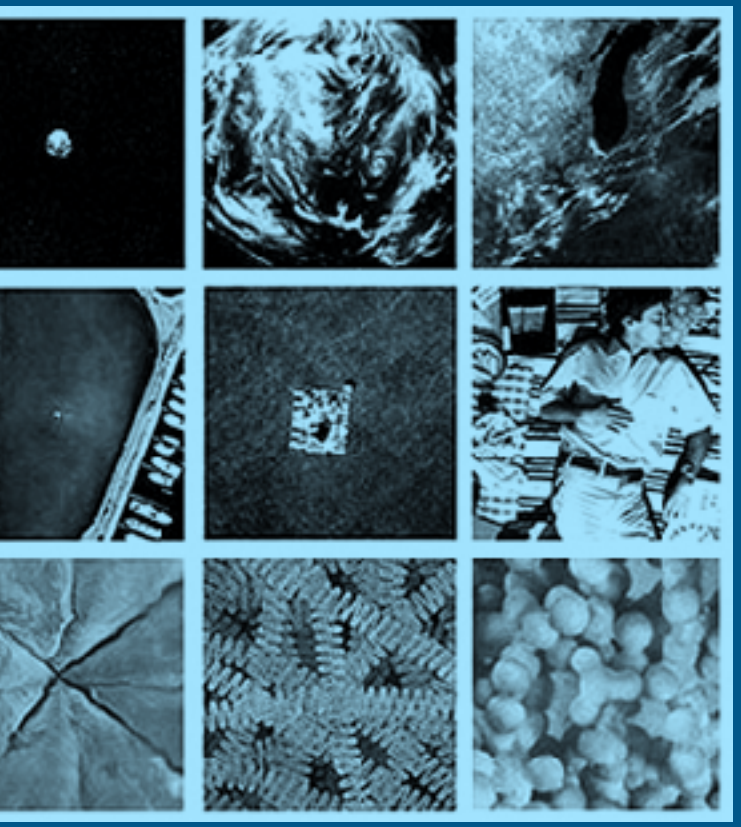
In addition to strategies for exploring context, there are frameworks and techniques for expanding boundaries and reframing any problem.



These methods and mindsets will help reveal overlooked possibilities and maximize every dimension of a problem's creative potential.

Generative Reframeworks

Scalar Thinking



Charles & Ray Eames
– *Powers of Ten*

How does the nature or paradigm of your problem (and its possible solutions) change when examined at different scales?

Ex: Urban transportation issue?

10^1: The automobile
10^2: Other traffic
10^3: Neighborhood
10^4: Local economy
10^5: Public transit
10^6: Suburban life
10^7: Infrastructure
10^8: Public health
10^9: National security
10^{10}: Climate change

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Generative Reframeworks

Adjacent Possible

"The adjacent possible is a kind of shadow future, hovering on the edges of the present state of things, a map of all the ways in which the present can reinvent itself." *– Steven Johnson*

Ex: Increments and Extremes

Breakthrough innovations often emerge from problem spaces that balance extreme user needs and incremental advances in design or technology. Think Apple, Tesla, OXO, etc…

Steven Johnson – Where Good Ideas Come From – https://stevenberlinjohnson.com/

Generative Reframeworks

Generative Lenses

Don't be such a straight shooter. While brainstorming new ideas and problem frames, throw yourself an occasional curve ball.

Ex: What if our problem was…

1. Inverted
2. Integrated
3. Extended
4. Differentiated
5. Emotional
6. Collaborative
7. Effervescent
8. Playful etc…

DIY: Design Impact & You – http://diytoolkit.org/tools/fast-idea-generator/

Exercise 3.1 (20 minutes)

Dimensional Reframing

3.1.1: Repeatedly reimagine your problem on different scales. Along the vertical axis of the template provided, write how your framing changes at each different scale.

3.1.2: Choose another dimension (e.g. time, cost, etc.) or polarity (e.g. digital-to-analog, collaborative-to-competitive, etc.) relevant to your problem, and chart it along the horizontal axis on the same template.

Imagine how the solution space would be different in each quadrant of your diagram.

Challenging Collaborators

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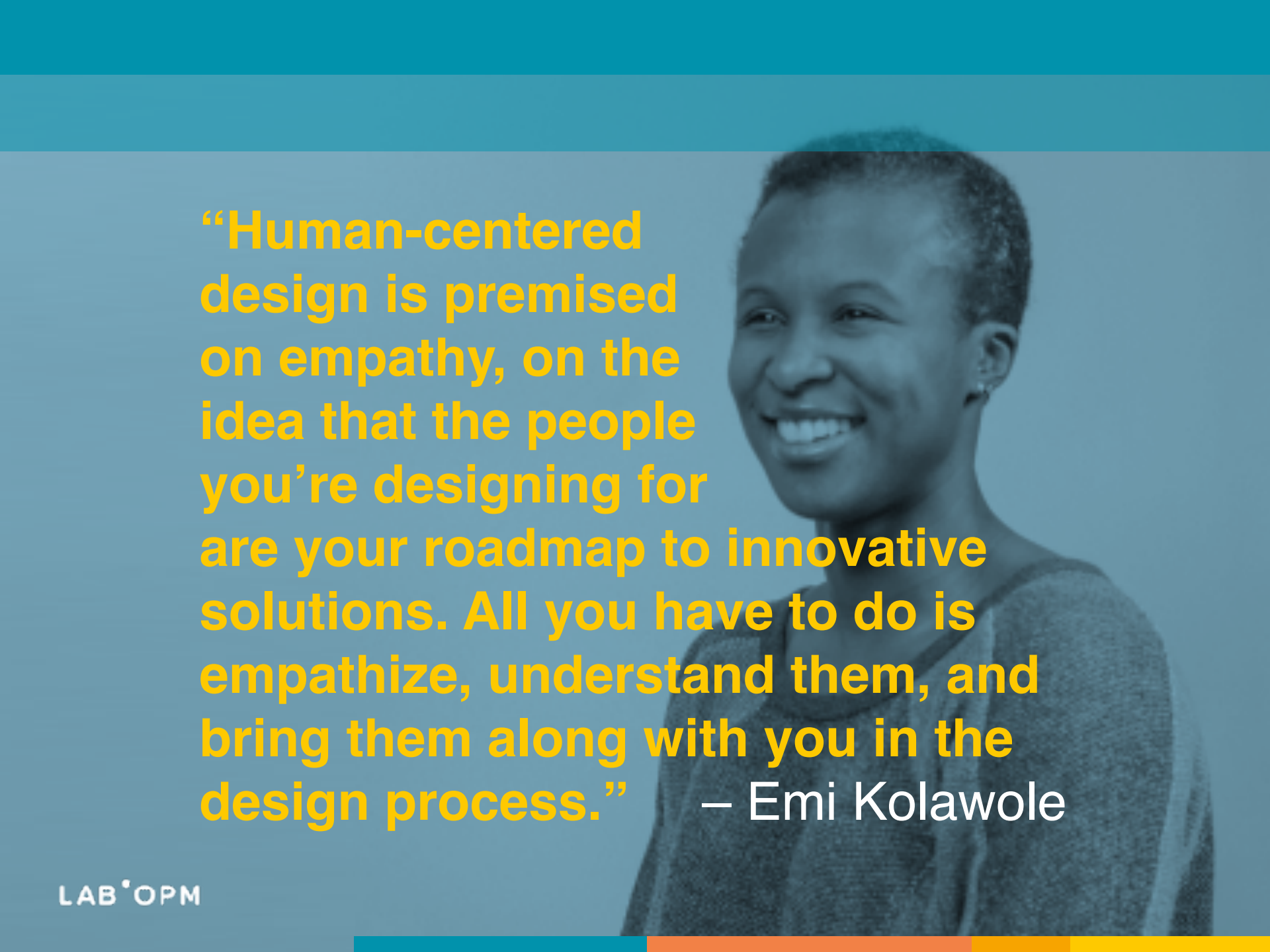
“Human-centered design is premised on empathy, on the idea that the people you’re designing for are your roadmap to innovative solutions. All you have to do is empathize, understand them, and bring them along with you in the design process.”
– Emi Kolawole
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Challenging Collaborators Means bringing them onboard

Meaning arrived at in a cube is only going to relevant in that cube.

Framing and reframing perceptions and problems means fighting cognitive biases and expanding understandings, which is best achieved with some help.

Challenging Collaborators

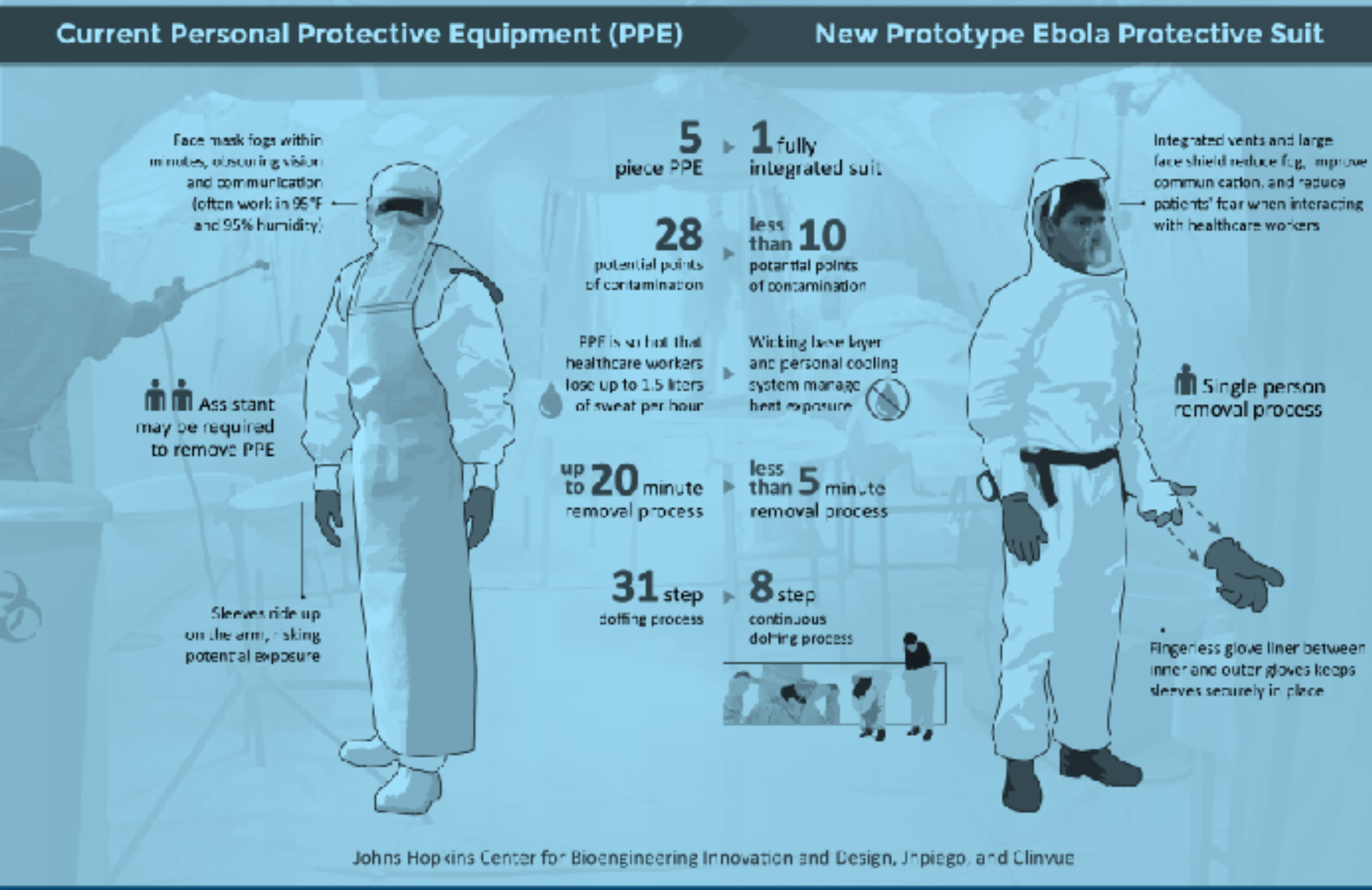
Bring them along

"During a service design process we need to involve customers as well as other stakeholders involved in exploring and editing the service proposition." – Stickdorn/Schneider

Ex: Participatory/Co-Design

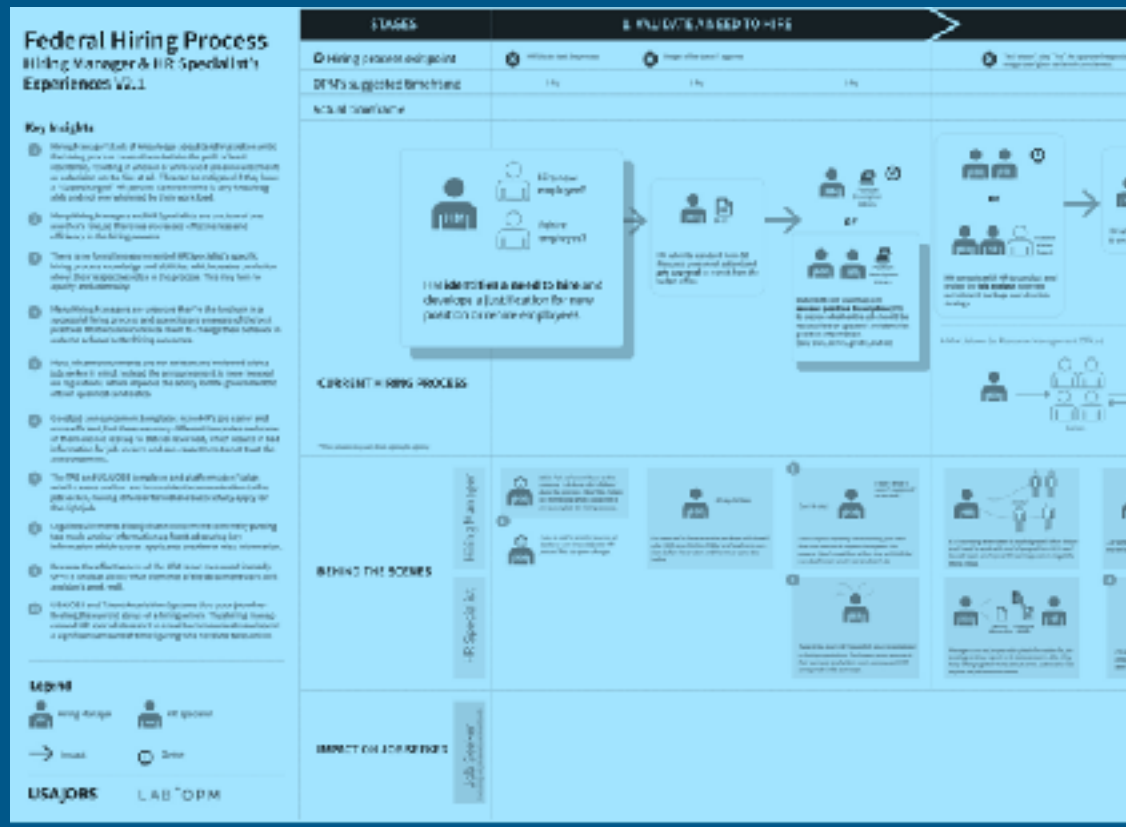
1. Generate more ideas
2. Share responsibility
3. Reduce friction in adopting new ideas
4. Gain investment and buy-in to outcomes

Stickdorn/Schneider – This Is Service Design Thinking – http://thisisservicedesignthinking.com/


Current Personal Protective Equipment (PPE)
New Prototype Ebola Protective Suit
Face mask fogs within minutes, obscuring vision and communication (often work in 95°F and 95% humidity)
Assistant may be required to remove PPE
Sleeves ride up on the arm, risking potential exposure
5 piece PPE
1 fully integrated suit
28 potential points of contamination
less than 10 potential points of contamination
PPE is so hot that healthcare workers lose up to 1.5 liters of sweat per hour
Wicking base layer and personal cooling system manage heat exposure
up to 20 minute removal process
less than 5 minute removal process
31 step doffing process
8 step continuous doffing process
Integrated vents and large face shield reduce fog, improve communication, and reduce patients' fear when interacting with healthcare workers
Single person removal process
Fingerless glove liner between inner and outer gloves keeps sleeves securely in place
Johns Hopkins Center for Bioengineering Innovation and Design, Inpiego, and Clinvue

Challenging Collaborators

Make it visual



The Lab at OPM - lab.opm.gov

Challenging Collaborators

Sketch it together

"There are techniques and processes whereby we can put experience front and center in design […] The basis for doing so lies in extending the traditional practice of sketching." – Bill Buxton

Ex: Sketchy Qualities & Benefits

1. Quick
2. Timely
3. Disposable
4. Plentiful
5. Minimalist

1. Invent and explore
2. Discuss, critique, and share ideas with others
3. Gestalt: Build on others
4. Choose ideas to pursue

Bill Buxton - *Sketching User Experiences: Getting the Design Right and the Right Design - https://www.interaction-design.org/literature/article/etch-a-sketch-how-to-use-sketching-in-user-experience-design*

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Challenging Collaborators

Break it down

Show your collaborators the full range of your problem frame, but also give them smaller options, phases, and easy starting points.

Ex: Menu of Manageable Morsels

1. *Here are a few different way to look at this…*
2. *Here are some problems with this problem…*
3. *Here are some trade-offs we can consider…*
4. *Here's a sequence in which we can do this…*
5. *Here's what may happen if we don't do this…*

Problem Space Showcase

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Show & Tell! (30 minutes)

Problem Space Showcase

Share your pesky problem.
(Try to keep it to 2-3 minutes.)

Where did you start? Where did you end up? What did you discover along the way?

Thank you!

lab.opm.gov • lab@opm.gov • @labOPM

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